Office of
Fissile Materials Disposition

United States Department of Energy

Surplus Plutonium Disposition Final Environmental Impact Statement

Comment Response Document

Volume III - Part B

November 1999

For Further Information Contact:
U.S. Department of Energy
Office of Fissile Materials Disposition, P.O. Box 23786, Washington, DC 20026-3786

Cover Sheet

Responsible Agency: United States Department of Energy (DOE)

Title: *Surplus Plutonium Disposition Final Environmental Impact Statement* (SPD EIS) (DOE/EIS-0283)

Locations of Candidate Sites: California, Idaho, New Mexico, North Carolina, South Carolina, Tennessee, Texas, Virginia, and Washington

Contacts:

For further information on the SPD Final EIS contact:

Mr. G. Bert Stevenson, NEPA Compliance Officer
Office of Fissile Materials Disposition
U.S. Department of Energy
P.O. Box 23786
Washington, DC 20026-3786
Voice: (202) 586–5368

For information on the DOE National Environmental Policy Act (NEPA) process contact:

Ms. Carol Borgstrom, Director
Office of NEPA Policy and Assistance
Office of Environment, Safety and Health
U.S. Department of Energy
1000 Independence Ave., SW
Washington, DC 20585
Voice: (202) 586–4600 or (800) 472–2756

Abstract: On May 22, 1997, DOE published a Notice of Intent in the Federal Register (62 Federal Register 28009) announcing its decision to prepare an environmental impact statement (EIS) that would tier from the analysis and decisions reached in connection with the *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic EIS*. At that time, the U.S. Environmental Protection Agency decided to be a cooperating agency. The *Surplus Plutonium Disposition Draft Environmental Impact Statement* (SPD Draft EIS) (DOE/EIS-0283-D) was prepared in accordance with NEPA and issued in July 1998. It identified the potential environmental impacts of reasonable alternatives for the proposed siting, construction, and operation of three facilities for the disposition of up to 50 metric tons (55 tons) of surplus plutonium, as well as a No Action Alternative. These three facilities would accomplish pit disassembly and conversion, plutonium conversion and immobilization, and mixed oxide (MOX) fuel fabrication.

For the alternatives that included MOX fuel fabrication, the SPD Draft EIS described the potential environmental impacts of using from three to eight commercial nuclear reactors to irradiate MOX fuel. The potential impacts were based on a generic reactor analysis that used actual reactor data and a range of potential site conditions. In May 1998, DOE initiated a procurement process to obtain MOX fuel fabrication and reactor irradiation services. In March 1999, DOE awarded a contract to Duke Engineering & Services, COGEMA Inc., and Stone & Webster (known as DCS) to provide the requested services. A *Supplement to the SPD Draft EIS* was issued in April 1999, which analyzed the potential environmental impacts of using MOX fuel in six specific reactors named in the DCS proposal. Those reactors are Catawba Nuclear Station Units 1 and 2 in South Carolina, McGuire Nuclear Station Units 1 and 2 in North Carolina, and North Anna Power Station Units 1 and 2 in Virginia.

DOE has identified the hybrid approach as its Preferred Alternative for the disposition of surplus plutonium. This approach allows for the immobilization of 17 metric tons (19 tons) of surplus plutonium and the use of 33 metric tons (36 tons) as MOX fuel. DOE has identified the Savannah River Site near Aiken, South Carolina, as the preferred site for all three disposition facilities (Alternative 3). DOE has also identified Los Alamos National

Laboratory in New Mexico as the preferred site for lead assembly fabrication, and Oak Ridge National Laboratory in Tennessee as the preferred site for postirradiation examination of lead assemblies.

Public Involvement: In preparing the SPD Final EIS, DOE considered comments on the SPD Draft EIS and the *Supplement to the SPD Draft EIS* received via mail, fax, and email, and comments recorded by phone and transcribed from videotapes. In addition, comments were captured by notetakers during interactive public meetings held on the SPD Draft EIS in August 1998 in Amarillo, Texas; Idaho Falls, Idaho; North Augusta, South Carolina; Portland, Oregon; and Richland, Washington, as well as during a public meeting on the *Supplement to the SPD Draft EIS* held in June 1999 in Washington, D.C. Comments received and DOE's responses to these comments are found in Volume III, the Comment Response Document, of the SPD Final EIS. Information on the surplus plutonium disposition program can be obtained by visiting the Office of Fissile Materials Disposition Web site at http://www.doe-md.com.

DOE/EIS-0283

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List of Acronyms

AEA	Atomic Energy Act of 1954
AECL	Atomic Energy of Canada Limited
AED	aerodynamic equivalent diameter
AIRFA	American Indian Religious Freedom Act
ALARA	as low as is reasonably achievable
AMWTP	Advanced Mixed Waste Treatment Project
ANL–W	Argonne National Laboratory–West
APSF	Actinide Packaging and Storage Facility
AQCR	Air Quality Control Region
ARF	airborne release fraction
ARIES	Advanced Recovery Integrated Extraction System
AVLIS	Atomic Vapor Laser Isotope Separation
BEA	Bureau of Economic Analysis
BEIR V	Report V of the Committee on the Biological Effects of Ionizing Radiations
BIO	Basis for Interim Operation
BLM	Bureau of Land Management
BNFL	British Nuclear Fuels
BWR	boiling water reactor
CAA	Clean Air Act
CAB	Citizens Advisory Board
CANDU	Canadian Deuterium Uranium (reactors)
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
CPP	Chemical Processing Plant
CWA	Clean Water Act of 1972, 1987
D&D	decontamination and decommissioning
DBA	design basis accident
DCS	Duke Engineering & Services, COGEMA Inc., and Stone & Webster
DNFSB	Defense Nuclear Facilities Safety Board
DOC	U.S. Department of Commerce
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOL	U.S. Department of Labor
DOT	U.S. Department of Transportation
DR	damage ratio
DU PEIS	*Final Programmatic Environmental Impact Statement for Alternative Strategies for Long-Term Management and Use of Depleted Uranium Hexafluoride*
DWPF	Defense Waste Processing Facility
EA	environmental assessment
EBR	Experimental Breeder Reactor (I or II)
EIS	environmental impact statement
EPA	Environmental Protection

	Agency
ES&H	environment, safety, and health
ESTEEM	Education in Science, Technology, Energy, Engineering, and Math
ETB	Engineering Test Bay
ETTP	East Tennessee Technology Park
FAA	Federal Aviation Administration
FDP	fluorinel dissolution process
FEMA	Federal Emergency Management Agency
FFCA	Federal Facility Compliance Agreement
FFF	Uranium Fuel Fabrication Facility
FFTF	Fast Flux Test Facility
FI	field investigation
FM	Farm-to-Market (road)
FMF	Fuel Manufacturing Facility
FMEA	failure modes and effects analysis
FMEF	Fuels and Materials Examination Facility
FONSI	finding of no significant impact
FPF	Fuel Processing Facility
FPPA	Farmland Protection Policy Act
FR	Federal Register
GAO	General Accounting Office
GDP	gaseous diffusion plant
GE	General Electric Company
GENII	Generation II, Hanford environmental radiation dosimetry software system
GPS	global positioning satellite
HE	high explosive
HEPA	high-efficiency particulate air (filter)
HEU	highly enriched uranium
HFEF	Hot Fuel Examination Facility
HHS	Department of Health and Human Services
HIGHWAY	(computer code for distances and populations along U.S. highways)
HLW	high-level waste
HLWVF	high-level-waste vitrification facility
HMIS	Hazardous Materials Information System
HWTPF	Hazardous Waste Treatment and Processing Facility
HYDOX	hydride oxidation
IAEA	International Atomic Energy Agency
ICPP	Idaho Chemical Processing Plant
ICRP	International Commission on Radiological Protection
ID DHW	Idaho Department of Health and Welfare
INEEL	Idaho National Engineering and Environmental Laboratory
INRAD	Intrinsic Radiation
INTEC	Idaho Nuclear Technology and Engineering Center
IPE	Individual Plant Examination
ISC	Industrial Source Complex Model
ISC3	Industrial Source Complex Model, Version 3
ISCST3	Industrial Source Complex Model, Short-Term, Version 3
ISLOCA	interfacing systems loss-of-coolant accident
ITP	In-Tank Precipitation Process
LANL	Los Alamos National Laboratory

LCF	latent cancer fatality
LDR	Land Disposal Restrictions
LEU	low-enriched uranium
LLNL	Lawrence Livermore National Laboratory
LLW	low-level waste
LOCA	loss-of-coolant accident
LPF	leak path factor
LWR	light water reactor
M&H	Mason & Hanger Corporation
MACCS2	Melcor Accident Consequence Code System (computer code)
MAR	material at risk
MD	Office of Fissile Materials Disposition
MEI	maximally exposed individual
MIMAS	Micronized Master
MMI	Modified Mercalli Intensity
MOX	mixed oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAS	National Academy of Science
NCRP	National Council on Radiation Protection and Measurements
NDA	nondestructive analysis
NEPA	National Environmental Policy Act of 1969
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NIOSH	National Institute of Occupational Safety and Health
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPH	natural phenomena hazard
NPS	National Park Service
NRC	U.S. Nuclear Regulatory Commission
NRU	National Research Universal
NTS	Nevada Test Site
NWCF	New Waste Calcining Facility
NWPA	Nuclear Waste Policy Act
NWS	National Weather Service
ORIGEN	ORNL Isotope Generation and Depletion Code
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
OSHA	Occupational Safety and Health Administration
PBF	Power Burst Facility
PEIS	programmatic environmental impact statement
PFP	Plutonium Finishing Plant
PIE	postirradiation examination
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 microns
PNNL	Pacific Northwest National Laboratory
PRA	probabilistic risk assessment
PSD	prevention of significant deterioration
PUREX	Plutonium-Uranium Extraction (Facility)
PWR	pressurized water reactor

R&D	research and development
RADTRAN 4	(computer code: risks and consequences of radiological materials transport)
RANT	Radioactive Assay and Nondestructive Test
RAMROD	Radioactive Materials Research, Operations and Demonstration
RCRA	Resource Conservation and Recovery Act, as amended
REA	regional economic area
RF	respirable fraction
RfC	reference concentration
RfD	reference dose
RFETS	Rocky Flats Environmental Technology Site
RFP	Request for Proposal
RIA	Reactivity Insertion Accidents
RIMS II	Regional Input-Output Modeling System II (computer code)
RISKIND	(computer code: risks and consequences of radiological materials transport)
ROD	Record of Decision
ROI	region of influence
RMF	Radiation Measurements Facility
RWMC	Radioactive Waste Management Complex
S/A	Similarity of Appearance (provision of Endangered Species Act)
SAR	safety analysis report
SARA	Superfund Amendments and Reauthorization Act of 1986
SCDHEC	South Carolina Department of Health and Environmental Control
SCE&G	South Carolina Electric & Gas Company
SCSHPO	South Carolina State Historic Preservation Officer
SDWA	Safe Drinking Water Act, as amended
SEIS	supplemental environmental impact statement
SHPO	State Historic Preservation Officer
SI	sealed insert
SMC	Specific Manufacturing Complex
SNF	spent nuclear fuel
SNM	special nuclear material
SPD	surplus plutonium disposition
SPD EIS	*Surplus Plutonium Disposition Environmental Impact Statement*
SPERT	Special Power Excursion Reactor Test
SRS	Savannah River Site
SSM PEIS	*Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management*
SST/SGT	safe, secure trailer/SafeGuards Transport
SWMU	solid waste management unit
SWP 1	Service Waste Percolation Pond 1
TA	Technical Area
TCE	trichloroethylene
TNRCC	Texas Natural Resource Conservation Commission
TPBAR-LTA	tritium-producing burnable absorber rod lead test assembly
TRA	technical risk assessment

TRANSCOM	transportation tracking and communications system
TRU	transuranic
TRUPACT	TRU waste package transporter
TSCA	Toxic Substances Control Act
TSP	total suspended particulates
TVA	Tennessee Valley Authority
TWRS	tank waste remediation system
TWRS EIS	*Tank Waste Remediation System Final Environmental Impact Statement*
UC	Regents of the University of California
UFSAR	updated final safety analysis report
USACE	U.S. Army Corps of Engineers
USC	United States Code
USEC	United States Enrichment Corporation
USFWS	U.S. Fish and Wildlife Service
UV	ultraviolet
VOC	volatile organic compounds
VORTAC	very high frequency omnidirectional range/tactical air navigation (facility)
VRM	Visual Resource Management
WAG 3	Waste Area Grouping 3
WERF	Waste Experimental Reduction Facility
WIPP	Waste Isolation Pilot Plant
WM PEIS	*Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*
WNP–1	Washington Nuclear Plant–1
WNP–2	Washington Nuclear Plant–2
WPPSS	Washington Public Power Supply System
WROC	Waste Reduction Operations Complex
WSRC	Westinghouse Savannah River Company
ZPPR	Zero Power Physics Reactor

Chemicals and Units of Measure

°C	degrees Celsius (Centigrade)
°F	degrees Fahrenheit
μCi	microcurie
μg	microgram
μm	micrometer (micron)
46°26'07"	46 degrees, 26 minutes, 7 seconds
Ci	curie
cm	centimeter
CO	carbon monoxide
CO_2	carbon dioxide
dB	decibel
dBA	decibel, A-weighted
DUF_6	depleted uranium hexafluoride
eH	oxidation reduction potential
ft	foot
ft^2	square foot
ft^3	cubic foot
g	gram
g	gravitational acceleration
gal	gallon
GWD/t	gigawatt days (per ton)
ha	hectare
hr	hour (in compound units)
in	inch
kg	kilogram
km	kilometer
km^2	square kilometers
kV	kilovolt
l	liter
lb	pound
m	meter
m^2	square meter
m^3	cubic meter
mg	milligram
mi	mile
min	minute
mph	miles per hour
mrem	millirem
MTHM	metric tons of heavy metal
MVA	megavolt-ampere
MW	megawatt
MWe	megawatt electric
MWh	megawatt-hour
N_2	nitrogen
nCi	nanocurie
NO_2	nitrogen dioxide
pCi	picocurie
pcm/F	percent mille/per degree Farenheit
pH	hydrogen ion concentration
$PM_{2.5}$	particulate matter less than or equal to 2.5 μm in diameter
PM_{10}	particulate matter less than or equal to 10 μm in diameter
ppm	parts per million
PuO_2	plutonium dioxide
rad	radiation absorbed dose
rem	roentgen equivalent man
s	second
SO_2	sulfur dioxide
t	metric ton
ton	short ton
UF_6	uranium hexafluoride
UO_2	uranium dioxide
yd	yard
yd^3	cubic yard
yr	year (in compound units)
wt %	weight percent

Metric Conversion Chart

To Convert Into Metric			To Convert Out of Metric		
If You Know	**Multiply By**	**To Get**	**If You Know**	**Multiply By**	**To Get**
Length					
inches	2.54	centimeters	centimeters	0.3937	inches
feet	30.48	centimeters	centimeters	0.0328	feet
feet	0.3048	meters	meters	3.281	feet
yards	0.9144	meters	meters	1.0936	yards
miles	1.60934	kilometers	kilometers	0.6214	miles
Area					
sq. inches	6.4516	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.092903	sq. meters	sq. meters	10.7639	sq. feet
sq. yards	0.8361	sq. meters	sq. meters	1.196	sq. yards
acres	0.40469	hectares	hectares	2.471	acres
sq. miles	2.58999	sq. kilometers	sq. kilometers	0.3861	sq. miles
Volume					
fluid ounces	29.574	milliliters	milliliters	0.0338	fluid ounces
gallons	3.7854	liters	liters	0.26417	gallons
cubic feet	0.028317	cubic meters	cubic meters	35.315	cubic feet
cubic yards	0.76455	cubic meters	cubic meters	1.308	cubic yards
Weight					
ounces	28.3495	grams	grams	0.03527	ounces
pounds	0.45360	kilograms	kilograms	2.2046	pounds
short tons	0.90718	metric tons	metric tons	1.1023	short tons
Temperature					
Fahrenheit	Subtract 32 then multiply by 5/9ths	Celsius	Celsius	Multiply by 9/5ths, then add 32	Fahrenheit

Metric Prefixes

Prefix	Symbol	Multiplication Factor
exa-	E	1 000 000 000 000 000 000 = 10^{18}
peta-	P	1 000 000 000 000 000 = 10^{15}
tera-	T	1 000 000 000 000 = 10^{12}
giga-	G	1 000 000 000 = 10^{9}
mega-	M	1 000 000 = 10^{6}
kilo-	k	1 000 = 10^{3}
hecto-	h	100 = 10^{2}
deka-	da	10 = 10^{1}
deci-	d	0.1 = 10^{-1}
centi-	c	0.01 = 10^{-2}
milli-	m	0.001 = 10^{-3}
micro-	μ	0.000 001 = 10^{-6}
nano-	n	0.000 000 001 = 10^{-9}
pico-	p	0.000 000 000 001= 10^{-12}
femto-	f	0.000 000 000 000 001 = 10^{-15}
atto-	a	0.000 000 000 000 000 001= 10^{-18}

COMMONWEALTH *of* VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
http://www.deq.state.va.us

Dennis H. Treacy
Director

(804) 698-4000
1-800-592-5482

September 15, 1998

Mr. Howard R. Canter, Acting Director
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, D.C. 20026-3786

RE: Surplus Plutonium Disposition Draft Environmental Impact Statement (DEIS)

Dear Mr. Canter

The Commonwealth of Virginia Agencies have completed their review of the DEIS for the noted action. The Department of Environmental Quality is responsible for coordinating Virginia's review of federal environmental documents and responding to the appropriate officials on behalf of the Commonwealth. The following locality and agencies participated in this review:

Department of Environmental Quality; and
Hampton Roads Planning District Commission.

In addition, the Department of Health and the Department of Emergency Services were invited to comment through the Department of Environmental Quality.

The document identifies reasonable alternatives and potential environmental impacts for the proposed citing, construction, and operation of three facilities for plutonium disposition. The first is a facility to disassemble and convert pits, a nuclear weapons component, into plutonium oxide suitable for disposition. The preferred sites are Pantex Plant and Savannah River Site (SRS). The second is a facility to immobilize surplus plutonium for disposal in a geologic repository. SRS is the preferred site. The third is a facility to fabricate plutonium oxide into mixed oxide (MOX) fuel. SRS is the preferred site. The EIS also discusses decommissioning and decontamination of the three facilities.

An Agency of the Natural Resources Secretariat

FD308

Mr. Howard R. Cantor
September 15, 1998
Page Two

The Commonwealth offers the following comments and recommendations:

- None of the facilities are located in Virginia. The Commonwealth's only concern is with shipment of the surplus plutonium through the state. Will this issue be addressed in the final EIS or in a separate document? 1

- Any transportation of wastes through Virginia should be preceded with advance notification to the Department of Emergency Services, Brian Iverson, at (804) 674-2400 and the affected localities so that adequate safety precautions may be taken. The localities should be notified directly in advance of any notification to the news media.

- The Department of Environmental Quality will coordinate the Commonwealth's review and response on the final environmental impact statement for this proposal, if appropriate. Correspondence should be addressed to: Director, Office of Environmental Impact Review, Department of Environmental Quality, P. O. Box 10009, 629 East Main Street, Richmond, Virginia 23240-0009.

Thank you for the opportunity to comment on the DEIS for the proposed activity. The comments of the reviewing agencies are attached for your review and consideration.

Sincerely,

Michael P. Murphy, Director
Division of Environmental Enhancement

Attachments

cc: Arthur L. Collins, Hampton Roads PDC
Brian Iverson, DES
Kerita L. Kegler, DEQ-TRO

FD308

FD308–1 **Transportation**

After DOE selects an alternative, a transportation plan (in which State, tribal, and local officials in addition to DOE, the carrier, and other Federal agencies would be involved) would be prepared to address the details of implementing the actions analyzed in this SPD EIS, including prenotification of States. The shipment of nuclear material (e.g., depleted uranium) using commercial carriers would be the subject of detailed transportation plans in which routes and specific processing locations would be discussed. These plans are coordinated with State, tribal, and local officials. The shipment of waste would be in accordance with the decisions reached on the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). The transportation of special nuclear materials is the subject of detailed planning with DOE's Transportation Safeguards Division. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in this SPD EIS. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

DOE reserves the right to consider traversing States in accordance with DOT regulations and route selection criteria. DOE Order 460.2, *Departmental Materials Transportation and Packaging Management*, and 10 CFR 71.97 contain the requirements for notifying States and tribes before shipping waste within or through their jurisdictions.

HAMPTON ROADS
PLANNING DISTRICT COMMISSION

RECEIVED
AUG 13 1998
INTERGOVERNMENTAL
AFFAIRS & COMPLIANCE ASSISTANCE

August 11, 1998

Mr. Thomas M. Felvey
Environmental Technical Service Administrator
Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Re: Surplus Plutonium Disposition
DEQ #98-061F (ENV:NUKE)

Dear Mr. Felvey:

Pursuant to your request of July 31, 1998, the staff of the Hampton Roads Planning District Commission has reviewed Surplus Plutonium Disposition Draft Environmental Impact Statement.

Based on this review, it appears that the report does not indicate whether any surplus plutonium will be transported using the ports or roads of the Hampton Roads region. We need this issue clarified before we can provide any significant comments on the proposed project. 1

We appreciate the opportunity to review this project. If you have any questions, please do not hesitate to call.

Sincerely,

Arthur L. Collins
Executive Director/Secretary

HRV:fh

HEADQUARTERS · THE REGIONAL BUILDING · 723 WOODLAKE DRIVE · CHESAPEAKE, VIRGINIA 23320 · (757) 420-8300
PENINSULA OFFICE · HARBOUR CENTRE, 2 EATON STREET · SUITE 502 · HAMPTON, VIRGINIA 23669 · (757) 728-2067

FD308

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
MICHAEL P. MURPHY
PAGE 4 OF 4

To: Thomas M. Felvey@OCS@DEQ
Cc:
Bcc:
From: Kerita L. Kegler@VABC1@DEQ
Subject: Environmental Review
Date: Thursday, August 13, 1998 10:33:32 EDT
Attach:
Certify: N
Forwarded by:

Thank you for the clarification. We don't have any comments on the information presented in the study. We, will however, be on the lookout for the citizen calls once the material starts moving thru tidewater.

Thanks again

FD308

ANONYMOUS
PAGE 1 OF 1

I would like to comment that I do not wish that this plutonium dump site be at Hanford, Washington. I don't think that they have proved that they can clean up the mess that they already have out there. Let's do that first and then project to the future. But right now I do not think Hanford is ready is ready for this. 1

PD010

PD010–1 **Alternatives**

DOE acknowledges the commentor's opposition to siting the proposed surplus plutonium disposition facilities at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

ANONYMOUS
PAGE 1 OF 1

Thank you for the opportunity to comment on the Storage and Disposition of Fissile Material. I would like to go on record stating that action should be conducted at Hanford utilizing the FMEF, Feed Material Examination Facility. I think that any other place in the United States would be a total disregard of the capabilities of the Hanford Site and would result in excessive of costs to do the project. Also all the hype about Hanford is exactly that, it is hype relative to what the anti-nuclear activist are saying. There is no shred of proof in anything that they are saying. And I think that it is incumbent upon the Department of Energy to take a strong stance and to tell them where they can put their opinions. It is about time the Department of Energy stands up, does the right thing rather than the politically correct easy way out. Thank you for your time and again FMEF is the name of the game. 1

PD009

PD009–1 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities using FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost and schedule estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

I believe you should select the Hanford Site as the place to bring the stuff. We have had it out here for years. We know how to handle it. We've never had an accident involving a fatality out here in regards to nuclear radiation or any of the material involved. I believe with an existing structure to house the stuff and handle it you will save yourselves a lot of money. Thank you. 1

PD007

PD007–1 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

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BENTON COUNTY
PAGE 1 OF 2

BENTON COUNTY STATEMENT
U.S. Department of Energy Draft EIS for Plutonium Disposition

We appreciate the opportunity to present the Benton County position on plutonium disposition.

Let me say at the outset that Benton County supports plans to vitrify and dispose of scrap plutonium in a national repository and to dispose of excess plutonium in a commercial reactor using mixed oxide (MOX) fuel. 1

We do however, have serious concerns with the decision-making process and the logic used to arrive at the preferred alternatives outlined in the draft EIS.

1st Point

The decision-making process up to this point has not adequately addressed cost. Using the Fuels and Materials Examination Facility (FMEF) for MOX fuel manufacturing provides substantial savings to the American taxpayer and to the DOE cleanup budget over construction of a new MOX manufacturing facility at Savannah River. Cost savings become even more attractive (over $500 million) when you consider co-locating both fuel fabrication and pit disassembly and conversion. To not fully consider these cost savings and share this information with the public is incompetent at best and intentionally misleading at worst. 2

2nd Point

The notion that the cleanup program at Hanford can't be completed effectively while supporting a fuel fabrication and pit disassembly/conversion is ridiculous! Both the environmental cleanup and plutonium disposition missions close the loop on the Cold War. When viewed from this perspective they are extremely compatible and both missions have local and state support. Washington State Governor Gary Locke has stated in a letter sent earlier this year to Secretary Pena that he would accept a MOX program at Hanford on the condition DOE TPA cleanup commitments are met. We support that position. 3

WAD07

WAD07–1 **Alternatives**

DOE acknowledges the commentor's support for the hybrid approach.

WAD07–2 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program at Hanford will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

WAD07–3 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion and MOX facilities at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

Conclusion

My comments are short today. Please see the previous meeting record for our detailed comments. What you are hearing today, and what you heard at the last meeting on this subject, is not new. What is baffling is your dogged determination to ignore the facts and proceed on a pre-determined course. This is not responsible governance. It cheats the American taxpayers and it further damages the credibility of the federal government, and the Department of Energy. 4

The EIS should be withdrawn, revised and a new draft issued that gives balanced consideration to all pertinent issues. And in the future, please don't come here and take our comments if you aren't willing to listen to what we have to say. It is a waste of time for all involved parties.

WAD07

WAD07–4 **General SPD EIS and NEPA Process**

No decisions on the siting of the proposed surplus plutonium disposition facilities have been made. DOE analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for surplus plutonium disposition facilities. All comments, regardless of how or from whom received, were given equal consideration and responded to. Decisions on the surplus plutonium disposition program will be based on public input, environmental analyses, technical and cost reports, and national policy and nonproliferation considerations.

BRIEHL, SUSAN
PAGE 1 OF 1

Susan Briehl
Holden Village
HCOO Stop 2
Chelan, WA 98816

Secretary of Energy
U.S. Department of Energy
1000 Independence Ave. S.W.
Washington, D.C. 20585

Dear Sir,

I am truly concerned about the plans to create mixed-oxide fuel to burn in commercial nuclear reactors, especially in the Pacific Northwest. This is dangerous, unwise, and only proliferates nuclear waste. We want to clean up Hanford and protect the Columbia River. 1

More importantly, my Christian faith calls me to tend and help heal the creation of God. Please, lets work together to eliminate all nuclear proliferation.

Sincerely,
Susan Briehl
Susan Briehl

FD338

FD338–1 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. To this end, surplus plutonium would be subject to stringent control, and the MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing. After irradiation, the MOX fuel would be removed from the reactor and managed with the rest of the spent fuel from the reactor, eventually being disposed of at a potential geologic repository built in accordance with the NWPA.

US DOE needs to hear your voice NOW!

1. Should Clean Up be the sole mission at Hanford? 1
Yes No

2. Should the United States Government maintain its longstanding policy against the use of weapons Plutonium to fuel civilian nuclear reactors? 2
Yes No

3. Which alternative would you prefer to see the US Department of Energy pursue: 3
Immobilization (encasement of plutonium in glass-like tombs)
Or
The MOX plan (burning plutonium to fabricate fuel for use in a civilian nuclear reactor)?

4. Should Plutonium, to be used for processing and fabrication of MOX fuel, be imported to the Hanford site along the Columbia River?
Yes No

5. How concerned are you about the transportation of Plutonium through the Northwest? 4
Not concerned slightly concerned very concerned completely opposed
B. How concerned are you about the transport through the ~~Northwest of fuel~~ containing weapons Plutonium?
Not concerned Slightly concerned Very concerned Completely opposed

6. Should commercial nuclear power plants be allowed to run on MOX fuel containing weapons Plutonium? 5
Yes No
B. Should they be subsidized ~~with tax~~ dollars to do so?
Yes No

7. Should MOX fuel containing weapons Plutonium be used to restart the FFTF reactor at Hanford to produce Tritium for ~~nuclear~~ bombs? 6
Yes No

Name Joan Chantler
Address 1009 Snowden
White Salmon Wa 98672
Phone 509-493-1976

Please return this to:
Hanford Action
25-6 NW 23rd Place #406
Portland, OR 97214
(503) 235-2531

MD289

MD289–1 **DOE Policy**

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

MD289–2 **Nonproliferation**

U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

MD289–3 **Alternatives**

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Under the hybrid approach, approximately 33 t (36 tons) of clean plutonium metal and oxides would be used to fabricate MOX fuel, which would be irradiated in domestic, commercial reactors. DOE has determined that 17 t (19 tons) of the surplus plutonium would be immobilized due to the complexity, timing, and cost that would be involved in purifying those plutonium materials to make them suitable for use in MOX fuel. Therefore, fabricating all 50 t (55 tons) of surplus plutonium into MOX fuel is not considered a reasonable alternative at this time and is not analyzed; however, immobilizing all of the surplus plutonium is analyzed. Given the variability in purity of the surplus plutonium to be dispositioned, some of the plutonium currently considered for MOX fuel fabrication may also need to be immobilized. The incremental impacts that would be associated with a small shift in materials throughput are discussed in Section 4.30.

MD289–4 **Transportation**

The shipment of nuclear material (e.g., depleted uranium) using commercial carriers would be the subject of detailed transportation plans in which routes and specific processing locations would be discussed. These plans are coordinated with State, tribal, and local officials. The shipment of waste would be in accordance with the decisions reached on the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). The transportation of special nuclear materials is the subject of detailed planning with DOE's Transportation Safeguards Division. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in this SPD EIS. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

MD289–5 **MOX Approach**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

MD289–6 **DOE Policy**

As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source. In December 1998, the Secretary of Energy decided that FFTF would not play a role in producing tritium.

CHANTLER, JOAN
PAGE 4 OF 4

Additional Comments:

Recreation, including windsurfing, is becoming our primary economy. A "Nuclear" wind day is desireable – a nuclear River is not. Please exercise care with our rivers.

7

MD289

MD289–7 **Water Resources**

As described in Section 4.26.1.2, surface water would not be used in construction and operation of the proposed surplus plutonium disposition facilities at Hanford. Due to the dilution capability of the Columbia River, as well as FMEF's location relative to the Columbia River, there would be no discernible contamination of aquatic biota (fish) or drinking water resulting from the proposed facilities at Hanford, either from minute quantities of air deposition into the river or from any other potential wastewater releases. Therefore, no discernible impacts on the Columbia River would be expected.

Hi, my name is M. B. Condon. I'm leaving a comment for the Surplus Plutonium Draft EIS. This comment is for myself and for Tim Young. Our address is 380 Ilsa Way, Goldendale, Washington, 98620. Our phone number is (509) 773-6991. And I'm going to read a statement we prepared. We tried to fax it into this number according to your message but were not able to get through and we are aware that the deadline is today, September 16. So I'm going to read a long statement in and we're also going to mail it, but I want this included in the public record. We want the following questions, concerns, and assumptions addressed in the Surplus Plutonium Draft EIS.

What classified toxic elements are contained in nuclear warhead pits and how much toxic pollution is going to be created by the separation of those elements from plutonium? Where are the toxic waste products going to be stored and how are they going to be handled? 1

Which specific reactors in the United States are going to be licensed to burn plutonium? How are reactors that were never designed for this fuel going to be tested and certified before allowing plutonium radiation to be generated by them? How are the safety records of commercial reactor operators going to be factored into the decisions to allow them to use plutonium as a reactor fuel? Why should reactors that are scheduled for decommissioning be allowed to continue operating beyond their scheduled life span and then be allowed to utilize a fuel they were never designed to burn? 2

PD062

PD062–1 **Pit Disassembly and Conversion**

A pit is made of plutonium, which consists mainly of the isotope plutonium 239. Pit plutonium can contain trace amounts of a variety of hazardous impurities such as beryllium and lead. These contaminants are expected to remain entrained in the plutonium dioxide material. The very low levels of contaminants do not adversely affect the MOX and immobilization approaches, and inclusion of the polishing step in the MOX facility would remove a good deal of the contaminants. Some pits may also be contaminated with tritium, a radioisotope of hydrogen, which can be removed by heating the pit material in a vacuum furnace to drive off the tritium gas. Another element, which may be present in pit plutonium at low levels, but above trace amounts, is gallium, which is added as an alloying agent. Because high levels of gallium may adversely affect MOX fuel performance, it would be removed during the plutonium polishing process, as discussed in Section 2.4.3.2. The pit conversion process would generate some LLW and TRU waste and a very small amount of mixed LLW and hazardous waste. These wastes include spent filters, used containers and equipment, paper and cloth wipes, protective clothing, shielding, solvents, and cleaning solutions. In general, these wastes contribute to less than 4 percent of the existing wastes at all the candidate sites and would be handled as part of the site waste management practice. A description of waste generation and management is provided in Appendix H.

PD062–2 **MOX Approach**

Although no U.S. commercial reactors are licensed to use plutonium-based fuel, several are designed to use MOX fuel, and others can easily accommodate a partial MOX core. Therefore, DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. As a result of this procurement, DOE identified Catawba, McGuire, and North Anna as the reactors proposed to irradiate MOX fuel as part of the proposed action in this SPD EIS. In accordance with a stipulation of its *RFP for MOX Fuel Fabrication and Reactor Irradiation Services*, these are new reactors, that is, reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program. The selected team, DCS, would have to apply for a reactor operating license amendment for each individual reactor before it can use MOX fuel. For this amendment, the licensee would have to demonstrate that all safety, testing, and environmental impacts have been addressed as well as complete the public hearing process. In addition, NRC would evaluate license applications and monitor the operations of both the MOX facility and the commercial reactors selected to use MOX fuel to ensure adequate margins of safety. Section 4.28 was revised to provide reactor-specific analyses and discuss the potential environmental impacts of using a partial MOX core during routine operations and reactor accidents.

Specifically, how much radioactive waste will be created by each step of plutonium reprocessing from the removal of plutonium oxide from bomb cores, the creation of MOX fuels, the transportation of all radioactive materials, including the waste products to the generation of electricity and possibly the production of tritium? How much more radioactive waste will be generated by each reactor that will be allowed to operate beyond its decommissioning date compared to amount of radioactive waste created if the reactor were retired on schedule? 3

How are DOE and the commercial reactor operators going to protect the public and the environment from the radioactive hazards posed by the generation of more nuclear waste from the burning of MOX fuels, when both the DOE and commercials operators have no idea of how to protect the public and the environment from the radiation hazards presently posed by the burning of uranium in reactors? 4

What specific transportation means and routes will be used to transport the weapons grade plutonium, MOX fuels, and the resulting nuclear and toxic waste? How will the public be notified so there elected officials can participate in the creation of disaster plans in the case of a mishap? What specific plans are in place for nuclear mishaps along the transportation routes and are they adequate to protect the public, crops, livestock, and the environment from exposure in the case of an accident or intentional destructive act? 5

PD062

PD062–3 **Waste Management**

DOE acknowledges the commentor's concerns regarding waste generation and management. Waste streams that would be generated by the pit conversion, immobilization, and MOX facilities are detailed in the Waste Management sections in Chapter 4 of Volume I and Appendix H. As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

The transportation requirements for the surplus plutonium disposition program are also evaluated in this SPD EIS. The shipment of waste will be done in accordance with the decisions reached on the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997).

The production of tritium in a commercial light water reactor is being evaluated in a separate DOE EIS, *Final EIS for the Production of Tritium in a Commercial Light Water Reactor* (DOE/EIS-0288, March 1999).

In choosing reactors to use the MOX fuel fabricated under the surplus plutonium disposition program, DOE looked at the criteria of reactor age. DOE chose only reactors whose planned operating life extended through the full life cycle of the surplus plutonium disposition program.

PD062–4 **Human Health Risk**

DOE and NRC are committed to protecting the health and safety of the public. This includes designing, constructing, and operating DOE- and NRC-regulated facilities (e.g., domestic, commercial reactors) in such a way as to continually provide a level of safety and reliability that meets or exceeds established standards. DOE and commercial reactors also have plans and programs for the safe management and ultimate disposal of their nuclear waste. Section 4.28 addresses the issue of waste generation by those domestic, commercial reactors designated to irradiate MOX fuel.

The remainder of this comment is addressed in response PD062–3.

PD062–5 **Transportation**

DOE anticipates that transportation of plutonium pits, nonpit plutonium, MOX fuel, and HEU (i.e., special nuclear materials) required to disposition surplus plutonium would be done through the DOE Transportation Safeguards Division using SST/SGTs as described in Appendix L.3.2. The shipment of nuclear material (e.g., depleted uranium) using commercial carriers would be the subject of detailed transportation plans in which routes and specific processing locations would be discussed. These plans are coordinated with State, tribal, and local officials. For emergency response planning, all shipments are coordinated with appropriate law enforcement and public safety agencies. If requested, DOE will assist these officials with response plans, and, if necessary, with resources in accordance with DOE Order 5530.3, *Radiological Assistance Program*. DOE has developed and implemented a Radiological Assistance Program to provide assistance in all types of radiological accidents. Through this coordination and liaison program, DOE offers in-depth briefing at the State level.

The transportation of depleted uranium oxide and waste (i.e., non-special nuclear materials) would be done using commercial carriers. Nuclear material shipments must comply with both NRC and DOT regulatory requirements. Appendix L.3.3 provides details on the transportation of this type of materials and the transportation route selection process. DOT routing regulations require that shipments of radioactive material be transported over a preferred highway network including interstate highways, with preference toward bypasses around cities, and State-designated preferred routes.

The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that will be required, by location, has been included in this SPD EIS. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http:\\www.doe-md.com.

We, M.B. Condon and Tim Young, are totally opposed to the reprocessing of weapons-grade plutonium into MOX fuel to be burned in commercial nuclear reactors. Furthermore, we believe there should be no taxpayer subsidies to commercial operators to allow them to use MOX fuels in reactors that were never designed to do so and to allow the life of reactors to be extended beyond their scheduled decommissioning date. The DOE and the commercial nuclear industries should not be allowed to initiate any programs that will create more radioactive and toxic wastes when the technology doesn't exist to deactivate and neutralize the waste created over the last 50 years by industry and the Government. We support the isolation and vitrification of weapons-grade plutonium. Although this is an inadequate solution to the radioactive waste problem, it at least offers some assurance that these materials won't find their way into nuclear weapons in the future. 6

Finally, we have no confidence in the DOE's ability to safely and securely transport weapons-grade plutonium and MOX fuel to reactor sites. The public and their elected representatives are totally uninformed and unprepared for any nuclear mishaps that could result. And we don't think that the DOE or the nuclear industry has the will or the resources to adequately prepare the public for the possible dangers that these materials represent to their communities. We are also unwilling to give up any of our rights so that these materials can be moved "securely" through our communities. 7 Thank you and we will be sending our comments through the mail. We would like to be submitted in the public record as we have recorded them on this message of September 16, 1998. Thank you.

PD062

PD062–6 **Alternatives**

DOE acknowledges the commentor's opposition to the MOX approach and support for the immobilization approach to surplus plutonium disposition.

U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons.

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

PD062–7 **DOE Policy**

It is DOE's policy that plutonium shipments must comply with applicable DOT and NRC regulatory requirements. The highway routing of nuclear material is systematically determined according to DOT regulations 49 CFR 171 through 179 and 49 CFR 397 for commercial shipments. Transportation of special nuclear materials, including fresh MOX fuel, would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE–owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material. As indicated in Section 2.18, no traffic fatalities from nonradiological accidents or LCFs from radiological exposures or vehicle emissions would be expected for any of the surplus plutonium disposition alternatives proposed at the candidate sites. A description of the transportation activities is given in Section 2.4.4. Transportation risks and steps to mitigate the risks are analyzed in Chapter 4 of Volume I and Appendix L.

Davenport, Leslie C.
Page 1 of 2

Leslie C. Davenport
Senior Engineer, Nuclear Safety (Retired)
1922 Mahan Avenue
Richland, WA 99352-2121

August 20, 1998

U.S. Department of Energy
Office of Fissile Materials Disposition
c/o SPD EIS
P.O. Box 23786
Washington, D.C. 20026-3786

Gentlemen:

Please include the following in the record of public comments for the "Surplus Plutonium Disposition Environmental Impact Statement" (SPD EIS). If there are questions, please contact me at my home telephone, (509) 946-4409.

I support the **HYBRID APPROACH** of **ALTERNATIVE 4B** for surplus plutonium disposition. I support the use of 33 metric tons or more to make MOX fuel. I support IMMOBILIZATION of the completely unusable scrap and waste (in CERAMIC form) using the CAN-IN-CANISTER method. However, only the initial 8 metric tons that was declared as surplus (waste, low-purity, nonpit plutonium) not suitable for use in MOX fuel should be immobilized promptly. The remaining 9 metric tons that was later declared surplus/waste should be retained until the MOX fuel fabrication process is operating to see if some of this Pu could be used in producing MOX fuel after all. 1

I agree that HANFORD'S TOP PRIORITY MUST REMAIN ENVIRONMENTAL CLEANUP, but do not believe it has to be Hanford's sole mission!

Alternative 4B involves pit storage at Pantex (both continuing long term for weapons stockpile pits, and short term until surplus pits are converted). The Pit Disassembly and Conversion Facility (PD&CF) should be located at Pantex. This will provide high security for the pits at Pantex until they are reduced to an unclassified geometry, since Pantex already has most of the U.S. inventory of pits. The Fuels and Materials Examination Facility (FMEF) at Hanford should be used for MOX Fuel Fabrication Facility and possibly the Immobilization Facility. The alternative would be immobilization at the High Level Waste Vitrification Facility (HLWVF) to be constructed at Hanford. Hanford is the only DOE site with extensive experience in fabrication, irradiation, and testing of MOX fuel (e.g., MOX fuel for FFTF and other research reactors was fabricated at Hanford).

The FMEF is an existing facility that was designed for plutonium processing, is uncontaminated and hence easy to modify, is built to modern safety standards in DOE's General Design Criteria, is licensable by the NRC, and meets NQA-1 equivalent standards. DOE/MD-0005 (1996) states in part that the FMEF is the "… least cost building option… capital cost savings on the order of $200 million… Well suited to accomplish the MOX fabrication mission." FMEF has 250,000 ft^2 on six levels, in which there is space for glovebox operations, hot cell operations, facility services, radiation control, and offices. FMEF offers proven operable systems with the least cost and schedule risk and is the quickest option to address the Congressional recommendation to rapidly reduce proliferation risk through pit disassembly and MOX fuel fabrication. The National Academy of Sciences evaluated FMEF as the lowest cost, most expeditious, and leading candidate option for MOX fuel fabrication. Further, Hanford already has complete infrastructure and waste handling facilities in place, and will soon have a high-level waste vitrification facility and associated analytical laboratories. 2

Please reconsider the initial decision to locate both the PD&CF and Immobilization Facilities at the Savannah River Site (SRS). Please address timing considerations and honest comparisons to bring existing or new facilities on-line and determine the most expeditious and economical way to proceed in an ACCURATE, POLITICALLY UNBIASED manner. The significant advantages of diversification and utilization of existing resources at Hanford is extremely important, and does not make the mistake of granting one site in the DOE complex all of the new missions.

Sincerely,

Les Davenport

Leslie C. Davenport,
Senior Engineer, Nuclear Safety (Retired)
Consultant, Criticality Safety

cc: Senator Slade Gorton, Congressman Doc Hastings

MD123

MD123–1 **Alternatives**

DOE acknowledges the commentor's support of Alternative 4B for surplus plutonium disposition. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Approximately 33 t (36 tons) of clean plutonium metal and oxides would be used to fabricate MOX fuel, which would be irradiated in domestic, commercial reactors. In the *Storage and Disposition PEIS* ROD, DOE committed to immobilizing at least 8 t (9 tons) of surplus, low-purity, nonpit plutonium. Since the ROD was issued, however, DOE has identified that an additional 9 t (10 tons) of low-plutonium-content materials would require additional processing, and would therefore be unsuitable for MOX fuel fabrication due to the complexity, timing, and cost that would be involved in purifying those plutonium materials.

MD123–2 **Alternatives**

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium*

Disposition (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

August 14, 1998

The U.S. Department of Energy needs to hear you voice NOW!
What do you think about a new era of nuclear proliferation?

Hanford Action of Oregon will forward this questionnaire to USDOE. Please circle your responses.

1. Should clean-up be the sole mission at Hanford? My folks taxes made the stuff – now use mine and my kids taxes to clean up the mess. 1
   Yes No

2. Should the United States government maintain its longstanding policy opposing the use of weapons ~~plutonium~~ to fuel civilian nuclear reactors? What about the Salt talks? Who are we kidding? 2
   Yes No

3. Should commercial nuclear reactors be allowed to run on MOX fuel containing weapons-grade plutonium? Dumb ideas die hard - Kill this idea. 3
   Yes No

Clean up

3a. Should they be subsidized with tax dollars to do so? We should stop subsidizing this insane industry.
   Yes No

4. Wh~~ich alternative~~ would you prefer to see the U.S. Department of Energy pursue: 4
   Immobilization (encasement of plutonium in glass logs or in cannisters for entombment). It may be too hot to bury if we ~~can~~ actually do it, but we ~~should~~ should at least try it.
   The MOX plan (processing plutonium into fuel for use in civilian nuclear reactors).

5. How concerned are you about the transportation of plutonium ~~through the Northwest to Hanford~~ anywhere? 5
   Not concerned Slightly Concerned Very Concerned and Completely opposed

6. How concerned are you about transporting plutonium MOX fuel ~~through the Northwest to Hanford~~ anywhere?
   Not concerned Slightly Concerned Very Concerned and Completely opposed

7. Should MOX fuel be used to restart the Fast Flux Text Facility (FFTF), a risky liquid-metal reactor at Hanford, to produce tritium for nuclear bombs? Never Start up the FFTF again. 6
   Yes No

Name Rochelle Giddings
Address 12211 C St S Tacoma WA 98444-5118
Phone ______ e-mail ______

Pasco High School Class of 1954 and still waiting for clean up.

Please return to Hanford Action of Oregon by September 10, 1998.

Hanford Action of Oregon
25-6 NW 23rd Pl. #406 tel: (503) 235-2924 fax: (503) 736-0097 e-mail: hannie@aol.com

MD276

MD276–1 **DOE Policy**

DOE acknowledges the commentor's view on cleanup of former weapons production sites. Weapons production was necessary for national security in the past, and now cleanup is necessary to provide a better environment for future generations.

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

MD276–2 **Nonproliferation**

An objective of the arms reduction is to make sure that the weapons materials declared surplus would not be used for weapons again. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this objective. Turning surplus plutonium into highly radioactive spent fuel would make reuse of this plutonium technically difficult, time consuming, and very costly.

U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

MD276–3 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach to surplus plutonium disposition. Analyses provided in Section 2.18.3 and Chapter 4 of Volume I for the alternatives that include MOX fuel fabrication and irradiation show that potential impacts would likely be minor.

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

MD276–4 **Alternatives**

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Under the hybrid approach, approximately 33 t (36 tons) of clean plutonium metal and oxides would be used to fabricate MOX fuel, which would be irradiated in domestic, commercial reactors. DOE has determined that 17 t (19 tons) of the surplus plutonium would be immobilized due to the complexity, timing, and cost that would be involved in purifying those plutonium materials to make them suitable for use in MOX fuel. Therefore, fabricating all 50 t (55 tons) of surplus plutonium into MOX fuel is not considered a reasonable alternative at this time and is not analyzed; however, immobilizing all of the surplus plutonium is analyzed. Given the variability in purity of the surplus plutonium to be dispositioned, some of the plutonium currently considered for MOX fuel fabrication may also need to be immobilized. The incremental impacts that would be associated with a small shift in materials throughput are discussed in Section 4.30.

Testing is under way to confirm that the immobilized plutonium would meet the performance criteria for disposal in a potential geologic repository pursuant to the NWPA.

MD276–5 **Transportation**

The shipment of nuclear material (e.g., depleted uranium) using commercial carriers would be the subject of detailed transportation plans in which routes and specific processing locations would be discussed. These plans are coordinated with State, tribal, and local officials. The shipment of waste would be in accordance with the decisions reached on the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). The transportation of special nuclear materials is the subject of detailed planning with DOE's Transportation Safeguards Division. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in this SPD EIS. Additional details are provided in Fissile Materials Disposition Program SST/SGT Transportation Estimation (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

MD276–6 **DOE Policy**

As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source. In December 1998, the Secretary of Energy decided that FFTF would not play a role in producing tritium.

Hanford Atomic Metal Trades Council
Keith A. Smith, Jr.
Page 1 of 3

I am concerned that the U S Department of Energy may not give cost the importance it deserves when selecting a site at which Pu pit disassembly will occur and MOX fuel fabrication takes place. The Hanford Atomic Metal Trades Council believes the FMEF at Hanford to be the best location at which to perform pit disassembly and MOX fuel fabrication and should be placed high on the options list for these operations. Siting these operations elsewhere to Hanford would materially add to the taxpayer burden by necessitating the construction of an entire new facilicty in which to perform the the pit disassembly and MOX fuel prouduction. Costs to upgrade Hanford facilities would cost much less. Much more less than to what the DOE now gives credence. That is due to the way the DOE estimates costs, the result of creative perspectives designed to put the best light on the preconceived notions of certain out of touch officials. 1

The Hanford Atomic Metal Trades Council would like to propose an independent review and some cost-benefit analyses of the different Sites which have been or are now lacking in honesty and candor.

The Hanford Atomic Metal Trades Council requests the decision for Siting the MOX fuel program and Pit disassembly operation to be reexamined and the FMEF be given full consideration for implementation in the forseeable future. To fail that and wind up spendiing hundreds of millions of dolllars more than necessary would seem to the Council to result in more reductions in available clean up dollars and put the entire clean up program in jeopardy. 2

WD007

WD007–1 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion and MOX facilities in FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

WD007–2 **General SPD EIS and NEPA Process**

DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for the proposed surplus plutonium disposition facilities.

Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

In the interest of saving dollars the Council also offers the represented work force at Hanford as a source of experienced workers and those who are trained to handle fissile material for the MOX fuel and pit disassembly activity. The Council is fully prepared to engage any new employer in a cooperative spirit and to facilitate the movement of experienced and trained workers into new missions with new, private employers, even as we are doing now with Johnson Controls. British Nuclear Fuels, the Vitrification Plant contractor has already expressed and interest in forming a working relationship with the Council and that willingness has been reciprocated.

The lastest edition of the Scientific American contains the report of a study which asserts that an organized work force is sixteen percent above the baseline in efficiency while a non-union work force is eleven percent below the baseline in efficiency. That should clearly place the Hanford Workforce at an advantage for cost effectiveness and thereby free up dollars for clean up. 1

Budget crunch at Hanford has already begun to stretch the existing work force beyond reasonable limits. It has come to the place where in some cases if two people are lost due to vacations or illness, no work can be done. We do not need further cuts and to irresponsibly site the MOX fuel production and pit disassembly somewhere beside Hanford will surely result in fewer dollars for cleanup.

WD007

HANFORD ATOMIC METAL TRADES COUNCIL
KEITH A. SMITH, JR.
PAGE 3 OF 3

The Hanford Atomic Metal Trades Council represents over 2,600 workers on the Site. These are the people who do the work and bear the greatest risk and responsibility on a daily basis, for working with and around nuclear materials of evey type. The U S Department of Energy would not regret siting the disassembly of Pu pits and the manufacture of MOX fuel at the FMEF at Hanford. 1

WD007

Hanford Communities

Richland • Kennewick • Pasco • West Richland • Benton City • Benton County

P.O. Box 190, Richland, WA 9935[illegible]
Telephone (509) 943-7348 Fax (509) 943-5666

October 17, 1997

Honorable Federico Peña
Secretary of Energy
U. S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Re: Use of Hanford Facilities for Plutonium Disposition

Dear Mr. Secretary:

BACKGROUND

We sincerely appreciated the opportunity to meet with you to discuss the Hanford Communities' concerns about environmental cleanup of the Hanford Site and the potential use of Hanford facilities for plutonium disposition. As a former Mayor, you clearly understand our concerns as elected officials, to see the Hanford cleanup proceed in the most expeditious and cost effective manner possible.

In examining the budget projections for 1998 and budget targets for 1999, even in the highest case budget scenarios, funding will fall short of covering the cleanup requirements in our Tri-Party Agreement. In 1999, in addition to environmental cleanup, the Department will also need to begin to take action to meet its responsibilities for tritium production and plutonium disposition. We anticipate that funds from existing programs will be drawn down to cover costs associated with these two new initiatives. We became aware of this situation in meetings we had with staff at the Office of Management and Budget in March. They informed us that no new money would be allocated to the Department of Energy. We believe, therefore, that it is essential for the Department to put political concerns aside and look for the lowest cost alternative, which would be to use existing Hanford facilities to accomplish these new missions. 1

FAST FLUX TEST FACILITY

Hanford's Fast Flux Test Facility is the newest and most sophisticated reactor in the DOE Complex. Recently completed studies indicate that this facility merits serious consideration for the production of tritium to meet the defense needs of the United States. Its potential for producing medical isotopes is of particular importance to the advancement of medical science and the economic stability of our communities. FFTF has historically run on mixed oxide fuel and therefore should additionally be considered for the role it can play in plutonium disposition. 2

WAD04

WAD04–1 **Cost**

Funds are not being taken from DOE's budget for environmental cleanup in order to support surplus plutonium disposition. Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably.

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

WAD04–2 **DOE Policy**

As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source. In December 1998, the Secretary of Energy decided that FFTF would not play a role in producing tritium.

HANFORD COMMUNITIES
HONORABLE LARRY HALER
PAGE 2 OF 4

FUELS AND MATERIALS EXAMINATION FACILITY

At our lunch meeting a month ago we discussed the advantages of using the Fuels and Materials Examination Facility (FMEF) located directly adjacent to FFTF for various tasks associated with plutonium disposition. This unique facility was built for the purpose of manufacturing mixed oxide (MOX) fuel for the nation's breeder reactor program. It is the only existing building in the country that can house both plutonium pit disassembly and conversion and mixed oxide fuel manufacturing in the same facility. Colocating these functions in one building will save hundreds of millions of dollars in operting and capital costs. 3

We also indicated to you that we, and others in the DOE Complex, believe there appears to be a strong bias on the part of DOE Headquarters' staff to locate all aspects of plutonium disposition facilities at the Savannah River Site. We have drawn this conclusion for many reasons. Last year, the Department completed a Programmatic Environmental Impact Statement (PEIS) addressing storage and disposition options for weapons useable fissile materials. The local Advisory Committee we appointed to analyze that PEIS, came to the conclusion that decision making criteria were heavily biased to achieve a Savannah River outcome. For your information, we have enclosed the critiques submitted by our communities and comments provided by DOE-Richland regarding the PEIS and the supporting technical summary documents. While extensive analysis is included in the technical documents regarding Savannah River facilities, virtually no consideration is given to facilities at Hanford. We are seeing this same bias surface in the current Environmental Impact Statement process. 4

NOTICE OF INTENT

In March, several of our local elected officials attended an Energy Communities Alliance meeting in Washington, D.C. While there, we discovered that the Department was about to issue a Notice of Intent to proceed with an Environmental Impact Statement designating Savannah River as the preferred alternative site for both plutonium immobilization and mixed oxide fuel fabrication. When we inquired why such a decision had been made prior to a full environmental impact assessment, we were given the following answers:

1. "It will be easier and cheaper to license a new building with the Nuclear Regulatory Commission as opposed to an existing facility." The NRC has not provided such advice to the Department of Energy. 5

2. "There will be strong opposition on the part of environmentalists in the Northwest to plutonium disposition functions occurring at Hanford." We encourage Department staff to look at a letter they received from the Military Production Network in December opposing any consideration of mixed oxide fuel for plutonium disposition anywhere in the country. Most of the organizations are located in the Eastern United States.

WAD04

WAD04–3 **Alternatives**

DOE acknowledges the commentor's support for collocating pit disassembly and conversion and MOX fuel fabrication in FMEF at Hanford. Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

WAD04–4 **General SPD EIS and NEPA Process**

For this SPD EIS, DOE carefully obtained comparable data on all of the alternatives, analyzed the data in a consistent manner using well-recognized and accepted procedures, and presented the results in a full and open manner. To properly address this comment, DOE again reviewed the subject critique together with the source material on the Hanford and SRS sites. The review indicated that all information from Hanford and SRS had been evaluated and used in a consistent, unbiased manner.

WAD04–5 **NRC Licensing**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at Hanford. An NOI statement on a preferred alternative is not a decision. The DOE statement regarding the potential difficulty of NRC licensing one of a number of facilities collocated in one building was based on DOE's understanding of NRC's regulatory requirements at the time of the Richland scoping hearing. Because a number of attendees at the Richland hearing indicated that there were precedents for NRC licensing collocated facilities, DOE met with NRC to discuss the issue, and included several alternatives (4B, 6B, and 6D) in the SPD Draft EIS that

Additionally, at the EIS Scoping Meeting held in Richland on July 1, 1997, spokesmen for two of the most vocal Hanford stakeholder environmental organizations offered testimony indicating that any plutonium disposition function at Hanford must not have a negative impact on the Hanford cleanup. They did not reject a plutonium disposition role. The combined attendance at the afternoon and evening meetings was over 150 people. The Department received overwhelming testimony in support of plutonium disposition functions being located at Hanford. 5

COST COMPARISONS

During the summer we learned that the Department was not intending to include cost considerations in identifying plutonium disposition sites. We do not know if this decision has been reconsidered. However, the evaluation of capital costs and the operational cost savings of co-locating plutonium disposition tasks would be favorable only to Hanford. By rejecting this increasingly important criteria, advantages of using the Hanford Site are diminished if not eliminated. 6

NRC LICENSING

At the Richland scoping meeting on July 1, 1997, the public was also informed that there would be an NRC licensing problem with co-locating plutonium pit disassembly, plutonium conversion, and MOX fuel assembly in one building. We asked who, in the Nuclear Regulatory Commission, had provided such advice to the Department of Energy and received no response. Our own conversations with NRC indicate that not only has such a decision not been made, but that specific discussions had not begun at that time. 7

SIZE OF FMEF - CO-LOCATION COST ADVANTAGES

We were advised at the scoping meeting that FMEF is not large enough to accommodate these various functions based on an analysis that was done by the National Laboratories. We indicated that nuclear fuel manufacturers, firms who have actually made mixed oxide fuel, have carefully analyzed the layout of the facility and have drawn the conclusion that there is adequate space to accommodate the various functions. This was affirmed as recently as August 1997 when a study team sent by DOE Headquarters visited the facility. A letter submitted by Siemens Power Corporation in July also affirming that the facility has adequate space is enclosed for your information. We are enclosing other documentation about the capabilities of the facility. This material has previously been provided to the Materials Disposition (MD) Office in DOE Headquarters. We keep providing documentation and MD staff keep coming up with new and creative reasons not to accept it. Frankly, this has become extremely frustrating. 8

We recognize that the seniority and political clout of the members of Congress from the State of Washington is not equal to that of members of Congress from the vicinity of the Savannah River Site. However, Congress and the Administration appear fully committed to balancing the budget in the next several years. Based on our conversations with staff at the 9

WAD04

collocate the MOX facility with one of the other proposed facilities in FMEF at Hanford. The decision that all three facilities would not be collocated in FMEF was made not because of potential NRC licensing issues, but rather because there is not enough space in FMEF to accommodate all three facilities. While no specific issues were identified for FMEF, NRC indicated that overall regulation of a collocated facility may be complicated and burdensome, depending on the degree of integration of the MOX facility and other nuclear facilities that would not be regulated by NRC.

WAD04–6 **Cost**

This comment is addressed in response WAD04–3.

WAD04–7 **NRC Licensing**

This comment is addressed in response WAD04–5.

WAD04–8 **NRC Licensing**

Collocation alternatives continue to be considered that involve the use of FMEF at Hanford. Alternatives 2 and 11A include collocating the immobilization and pit conversion facilities; Alternative 4B, the immobilization and MOX facilities; and Alternative 6B, the MOX and pit conversion facilities. The only alternative eliminated for consideration in this SPD EIS was collocating all three proposed surplus plutonium disposition facilities in FMEF based on space requirements. The most current data available shows the size required for each of the three proposed facilities preclude the use of FMEF.

WAD04–9 **Cost**

This comment is addressed in response WAD04–3.

HANFORD COMMUNITIES
HONORABLE LARRY HALER
PAGE 4 OF 4

Office of Management and Budget, we don't anticipate that any new money will be provided to the Department for plutonium disposition or tritium production. Therefore, the merits of using existing facilities that will save the Department hundreds of millions of dollars in capital and operating costs should not be ignored. 9

LACK OF LOBBYING EFFORTS

Most recently we have been informed that we will not be chosen for a plutonium disposition role at Hanford because we have not been lobbying the Department of Energy as aggressively as Savannah River. I do not beleive that conclusions should be drawn in an Environmental Imapct Statement based on political clout or lobbying efforts in Washington D.C. 10

CONCLUSION

We are simply asking for a fair, balanced evaluation of plutonium disposition alternatives using relevant criteria. Based on what has happened in the last year and our current observations, this is not happening. We believe that a document is being constructed to justify a previously drawn conclusion. If this is the case, it opens the Record of Decision up to legal challenges and accompanying programmatic delays. We stand ready to appeal if it becomes necessary, but hope that such a legal challenge is not required.

We have been informed that last December you indicated to your future staff that you were not happy about the lack of consideration that was given to the role FFTF can play in plutonium disposition and that you would require full, fair evaluation of alternatives in the future. We believe that your personal involvement will be required to be sure that this EIS process involves a full and complete analysis of options. Many studies and reports have been written about the capabilities of FMEF. Jim Mecca and his staff from the Richland Operations Office can easily answer any questions you may have about the facility. 11

We appreciate your attention to this issue and the opportunity to provide information directly to you about the advantages of using Hanford facilities for plutonium disposition.

Sincerely,

Larry Haler
Mayor

Enclosures

WAD04

WAD04–10 **General SPD EIS and NEPA Process**

As discussed in response WAD04–1, DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

WAD04–11 **General SPD EIS and NEPA Process**

Close coordination with the Richland Operations Office was maintained during the preparation of this SPD EIS to ensure that the best possible information was used. Furthermore, personnel from that office participated in detailed reviews and revision of the EIS prior to its approval and release. Liaison with the Richland Operations Office on the disposition of surplus plutonium would continue until such time as all of the surplus plutonium at Hanford had been dispositioned.

TESTIMONY OF
LARRY HALER, CHAIRMAN,
HANFORD COMMUNITIES GOVERNING BOARD

Regarding the Surplus Plutonium Disposition
Draft Environmental Impact statement

I am Richland Mayor Larry Haler, speaking on behalf of the Hanford Communities regarding the draft surplus Plutonium Disposition Environmental Impact Statement.

The "Hanford Communities" is an intergovernmental organization formed by the cities of Richland, Kennewick, Pasco, West Richland, Benton City and Benton County to deal with Hanford related issues that affect our community.

Before I begin, please allow me to express our appreciation to the Department of Energy for holding a Public Hearing in our community. However, I must say that we were very disappointed that the new Director of the Office of Material Disposition did not choose to attend this hearing and hear the views of the people who live in this region. 1

Hanford Communities Position

The five cities and county that comprise the Hanford Communities have done a careful evaluation of the possibility of Hanford playing a role in the disposition of this nation's excess plutonium. We formed an advisory group over two years ago, comprised of 30 people with diverse backgrounds and interests, to study this issue. They divided up into subcommittees to carefully study such topics as transportation, health & safety, MOX fuel & plutonium conversion, reactor burn options, vitrification, socioeconomic issues and national security issues. As a result of their efforts and recommendations, the Hanford Communities collectively and through the unanimous votes of the five city councils and the Benton County Board of Commissioners, have taken the following positions: 2

* We strongly support the reactor burn option as the preferred plutonium disposition alternative.

WAD02

WAD02–1 **General SPD EIS and NEPA Process**

Because of scheduling conflicts, it was not possible for the Director to attend all public hearings. Please be assured, however, that MD will review and consider all public comments made on the SPD Draft EIS regardless of how they were submitted: public hearings, mail, a toll-free telephone or fax line, or the MD Web site.

WAD02–2 **Alternatives**

DOE acknowledges the commentor's support for the surplus plutonium disposition program at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

HANFORD COMMUNITIES GOVERNING BOARD
HONORABLE LARRY HALER
PAGE 2 OF 4

* We believe Hanford offers the best and most compelling cost and schedule advantage with the least environmental, health and safety and proliferation risks for plutonium processing and mixed oxide fuel assembly. 2

* Not only can mixed oxide fuel be manufactured here at Hanford, it can also be used in our Fast Flux Test Facility and in the reactor owned by the Washington Public Power Supply System. 3

EIS Process

A year ago at the scoping meeting that you held in our city, we asked you to conduct a fair analysis of the facts to determine the best location for plutonium disposition facilities.

We were aware that the Department had a strong bias to locate all of these functions at Savannah River.

We presented strong testimony supported by factual information pointing out the significant cost savings of using the only facility in the country designed and built to manufacture mixed oxide fuel. 4

We pointed out the cost savings of locating two or three Pu disposition functions in one facility. We discussed the fact that MOX fuel has been produced here before and that our workforce has the skills and experience to produce fuel again.

We defined for you the schedule savings of using an existing facility verses designing, permitting and building a new greenfield facility.

Our arguments fell on deaf ears.

The arguments you used to discredit Hanford evolved as they were proven wrong. First you said the Nuclear Regulatory Commission would never license more than one function in one facility. They disagreed. 5

Then you interpreted a letter from our Governor stressing his concern about progress on the Hanford cleanup to say that he would not accept new 6

WAD02

WAD02–3 **MOX RFP**

DOE acknowledges the commentor's support for using MOX fuel in FFTF at Hanford and in the Washington Public Power Supply System reactor. As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source. DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. As a result of this procurement process, DOE identified Catawba, McGuire, and North Anna as the reactors proposed to irradiate MOX fuel as part of the proposed action in this SPD EIS. Section 4.28 was revised to provide reactor-specific analyses and discuss the potential environmental impacts of using a partial MOX core during routine operations and reactor accidents.

WAD02–4 **General SPD EIS and NEPA Process**

The purpose of this SPD EIS is to evaluate the environmental impacts of siting and operating the proposed surplus plutonium disposition facilities at the candidate sites. Although cost will be a factor in the decisionmaking process, this EIS contains environmental impact data and does not address the costs associated with the various alternatives. Because cost issues are beyond the scope of this EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

WAD02–5 **NRC Licensing**

This DOE statement regarding the potential difficulty of NRC licensing facilities collocated in one building was based on DOE's understanding of NRC's regulatory requirements at the time of the Richland scoping hearing. Because a number of attendees at the Richland hearing indicated that there were precedents for NRC licensing collocated facilities, DOE met with NRC to discuss the issue. As a result, DOE included several alternatives (4B, 6B, and 6D) in the SPD Draft EIS that collocated the MOX facility with one of the other proposed surplus plutonium disposition facilities in FMEF at Hanford. The decision that all three facilities would not be collocated in FMEF was made not because of potential NRC licensing issues, but rather because there is not enough space in FMEF to accommodate all three facilities. While no specific issues were identified for FMEF, NRC indicated that overall regulation of a collocated facility may be complicated and burdensome, depending on the degree of integration of the MOX facility and other nuclear facilities that would not be regulated by NRC.

WAD02–6 **Alternatives**

This comment is addressed in response WAD02–2.

HANFORD COMMUNITIES GOVERNING BOARD
HONORABLE LARRY HALER
PAGE 4 OF 4

missions. This spring he wrote a new letter to the Secretary of Energy to clarify what was clearly his intent in the first letter. 6

You said FMEF was not large enough to accommodate multiple functions. Documents prepared by nuclear fuel manufacturers disagreed. 7

While **understating** Hanford's capabilities and refusing to acknowledge documentation paid for by your own Department, some believe that you have clearly **overstated** capabilities of other sites. 8

Meeting with Secretary Pena

Last September our community officials met with Secretary Pena to discuss several issues of concern to us. At that time we notified him that he could anticipate that this draft EIS would fail to acknowledge the cost and schedule savings that Hanford offers. We told him that there was a clear bias towards Savannah River that could be identified in the technical documents supporting this EIS process. He asked us to document these concerns and provide the information directly to him. We did. 9

We provided him with a notebook of information. Much of the material we cited was prepared by the Department of Energy. We never received the courtesy of a response. I am now submitting this information for the record and I want a response.

Conclusion

The preferred alternatives you have identified will cost U.S. taxpayers hundreds of millions of dollars more than the Hanford alternative. 10 Where do you plan to get this money? Do you plan to take these dollars out of the funds required for environmental cleanup? 11 We are already anticipating a significant shortfall in funding needed in FY 2000 to meet compliance agreements around the country.

We will take our arguments to the new Secretary of Energy and the new Director of the Office of Fissile Materials Disposition. Perhaps they will bring reason and common sense to this process.

WAD02

WAD02–7 **Alternatives**

Based on all available data, DOE determined that the proposed surplus plutonium disposition facilities can not be located in FMEF because there is not enough space, even if common support functions were shared. See Sections 2.4.1.1, 2.4.2.1, and 2.4.3.1 for design layouts and the amount of space required for each facility is discussed in Section 2.6. Because of space limitations, two facilities would be located in FMEF—in the case of Alternative 2, pit conversion and immobilization. The MOX facility would be located in a new building.

WAD02–8 **Alternatives**

DOE acknowledges the commentor's concern regarding DOE's assessment of Hanford's capabilities relative to the other candidate sites.

WAD02–9 **General SPD EIS and NEPA Process**

For this SPD EIS, DOE carefully obtained comparable data on all of the alternatives, analyzed the data in a consistent manner using well-recognized and accepted procedures, and presented the results in a full and open manner. To properly address this comment, DOE again reviewed the subject notebook together with the source materials provided by the Richland Operations Office. The review indicated that all information from Hanford and SRS had been evaluated and used in a consistent, unbiased manner.

WAD02–10 **Cost**

This comment is addressed in response WAD02–4.

WAD02–11 **DOE Policy**

Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably.

My name is Barry Haus. I am a resident of Richland, WA. I am calling and commenting on your plans for processing spent fuel, specifically the plutonium and processing it into commercial fuel. My comment is that Hanford, the Hanford Site would be more suited for one of the missions which should be, although it is probably not currently planned to reprocess the N Reactor fuel. As I understand, it is probably 1600 tons of spent fuel in the K Reactor basins that needs to be processed, at least handled. I believe if you check into it you will find that approximately 2% of the weight of the fuel is fissile material which would just as well be used for commercial spent fuel, excuse me, new spent, new commercial fuel elements. Anyway you might factor in your thinking that particular problem the 1600 tons of N Reactor fuel that has to be dealt with somehow. Thank you very much. 1

PD011

PD011–1 **DOE Policy**

DOE acknowledges the commentor's support of reprocessing N Reactor spent fuel. However, the U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. Therefore, reprocessing would not be an option for disposing of the N Reactor spent fuel.

HOLTZ, TED
PAGE 1 OF 1

Hello. My name is Ted Holtz and I live along the Columbia River. I built a house there and I would like to express my concerns about (being) directly affected by Hanford not being cleaned up. Express my concerns about how the issue seems to be confounded by corporate interests in creating this MOX uranium or MOX fuel. I think the focus should be on clean up and just cleanup, and proper storage and disposal of the waste and not trying to make a corporate kind of welfare system that will support the failing nuclear industry by creating a sort of taxed corporate welfare system for that industry. So I just want to express that and a household of five and everybody in my household agrees with this statement. Thank you very much. My phone number is (360) 837-3022 if there is any response or questions directed towards me. Thank you very much. Bye. 1

PD035

PD035–1 **Alternatives**

DOE acknowledges the commentor's opposition to the MOX approach and to siting the MOX facility at Hanford. Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

United States Department of Energy

Comment Form

NAME: (Optional) Leslie Johnson
ADDRESS: 43604 E Shannon Lane
TELEPHONE: (509) 967-3258
E-MAIL: beegbyte@aol.com

Over the years we have spent trillions of taxpayer dollars on making Plutonium. Now is the time for our country to reclaim some of those taxpayer dollars by conversion of surplus Plutonium into MOX. MOX fuel should be burned in commericial reactors so the citizens of this country can recieve cheap electricity. After all it is thier money. 1

The DOE should avail itself to the use of existing facilities to process excess Plutonium. New facilities are not required. 2

DOE has demonstrated a continual pattern to make decisions based on politics. I implore the DOE to make decisions based on economics and common sense. PLEASE ACT RESPONSIBLY FOR A CHANGE 3

WAD01

WAD01–1 **MOX Approach**

DOE acknowledges the commentor's support for the MOX approach. The use of MOX fuel in domestic, commercial reactors is not proposed in order to produce electricity. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

WAD01–2 **Alternatives**

DOE evaluated the use of existing facilities and identified potential facilities at Hanford (FMEF) and INEEL. Of the alternatives considered, only Hanford had existing facilities suitable for MOX fuel fabrication. After further evaluation of space requirements, DOE concluded that there is not enough space in FMEF to accommodate all three of the proposed surplus plutonium disposition facilities. Therefore, the alternatives include siting one or two of the three proposed facilities in existing facilities at Hanford, and the pit conversion facility in an existing facility at INEEL.

WAD01–3 **General SPD EIS and NEPA Process**

Siting of the proposed surplus plutonium disposition facilities is not a political decision. Decisions on the surplus plutonium disposition program will be based on technical and cost reports, environmental analyses, national policy and nonproliferation considerations, and public input.

KILBURY, CHARLES D.
PAGE 1 OF 1

Good afternoon, ladies and gentlemen:

I am Charles D. Kilbury, mayor of the city of Pasco, but I am speaking for myself only:

It is hard to justify action taken in the Draft Plutonium Disposition Environmental Impact statement. The Record of Decision for the storage and disposition of Weapons - Usable Fissile Materials Programmatic EIS included the Hanford Project for both plutonium disposition options. And certainly the Fuels and Materials Examination Facility is the best and most efficient production of the "burn" as mixed oxide fuel, and the presence of considerable Plutonium on the Hanford Project makes it much more expedient than transporting in all directions over the far reaches of the United States.

The FMEF is an existing, unused facility that has been evaluated for performing a combination of the disposition activities.

. The FMEF is operationally complete with 120,000 square feet of process space.

. Designed and constructed to NRC reactor standards and is deemed capable of NRC licensing. 1

. Hazardous or radioactive materials have never been used in the FMEF making it easy to install a plutonium disposition mission.

. An FFTF MOX fuel fabrication line was installed, but has never been used.

The evaluation by the Office of Fissile Materials Dispostion indicates that FMEF has sufficient space within the exisiting structure to perform both of the disposition functions (e.g., pit disassembly and MOX Fuel fabrication).

All this can be done cheaper than anywhere else; there is a supply of surplus Plutonium on the Hanford Project, and even reactors to accomplish the burn. It will certainly be difficult to justify not using this magnificant facility built just for this purpose.

WAD05

WAD05–1 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

US DOE needs to hear your voice NOW!

1. Should Clean Up be the sole mission at Hanford? | 1
   Yes   No

2. Should the United States Government maintain its longstanding policy against the use of weapons Plutonium to fuel civilian nuclear reactors? | 2
   Yes   No

3. Which alternative would you prefer to see the US Department of Energy pursue: | 3
   Immobilization (encasement of plutonium in glass-like tombs)
   Or
   The MOX plan (burning plutonium to fabricate fuel for use in a civilian nuclear reactor)?

4. Should Plutonium, to be used for processing and fabrication of MOX fuel, be imported to the Hanford site along the Columbia River?
   Yes   No

5. How concerned are you about the transportation of Plut~~onium through the~~ Northwest? | 4
   Not concerned   slightly concerned   very concerned   completely opposed
   B. How concerned are you about the transport through the ~~Northwest of fuel~~ containing weapons Plutonium?
   Not concerned   Slightly concerned   Very concerned   Completely opposed

6. Should commercial nuclear power plants be allowed to run on MOX fuel containing weapons Plutonium? | 5
   Yes   No
   B. Should they be subsidized ~~with tax~~ dollars to do so?
   Yes   No

7. Should MOX fuel containing weapons Plutonium be used to restart the FFTF reactor at Hanford to produce Tritium for nuclear bombs? | 6
   Yes   No

Name IAN & AIKO LOW
Address PO BOX 651
STEVENSON, WA 98648
Phone USA

Please return this to:
Hanford Action
25-6 NW 23rd Place #406
Portland, OR 97214
(503) 235-2531

Let's not make anymore mistakes. Lets clean-up Hanford now without fail! | 7
Aiko E. Low & family
we live and recreate in and along the Columbia

MD288

MD288–1 **DOE Policy**

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

MD288–2 **Nonproliferation**

U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

MD288–3 **Alternatives**

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Under the hybrid approach, approximately 33 t (36 tons) of clean plutonium metal and oxides would be used to fabricate MOX fuel, which would be irradiated in domestic, commercial reactors. DOE has determined that 17 t (19 tons) of the surplus plutonium would be immobilized due to the complexity, timing, and cost that would be involved in purifying those plutonium materials to make them suitable for use in MOX fuel. Therefore, fabricating all 50 t (55 tons) of surplus plutonium into MOX fuel is not considered a reasonable alternative at this time and is not analyzed; however, immobilizing all of the surplus plutonium is analyzed. Given the variability in purity of the surplus plutonium to be dispositioned, some of the plutonium currently considered for MOX fuel fabrication may also need to be immobilized. The incremental impacts that would be associated with a small shift in materials throughput are discussed in Section 4.30.

MD288–4 **Transportation**

The shipment of nuclear material (e.g., depleted uranium) using commercial carriers would be the subject of detailed transportation plans in which routes and specific processing locations would be discussed. These plans are coordinated with State, tribal, and local officials. The shipment of waste would be in accordance with the decisions reached on the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). The transportation of special nuclear materials is the subject of detailed planning with DOE's Transportation Safeguards Division. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in this SPD EIS. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

MD288–5 **MOX Approach**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

MD288–6 **DOE Policy**

As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source. In December 1998, the Secretary of Energy decided that FFTF would not play a role in producing tritium.

MD288–7 **DOE Policy**

As described in Section 4.26.1.2, surface water would not be used in construction and operation of proposed surplus plutonium disposition facilities at Hanford Due to the dilution capability of the Columbia River, as well as FMEF's location relative to the Columbia River, there would be no discernible contamination of aquatic biota (fish) or drinking water resulting from the proposed facilities at Hanford, either from minute quantities of air deposition into the river or from any other potential wastewater releases. Therefore, no discernible impacts on the Columbia River would be expected.

The remainder of this comment is addressed in response MD288–1.

LUMPKIN, CHARLES L.
PAGE 1 OF 2

RESPONCE TO

SPD EIS

BY

CHARLES L. LUMPKIN

Charles L. Lumpkin
603 N. 48th Ave.

FD114

LUMPKIN, CHARLES L.
PAGE 2 OF 2

Yakima, wa 98908
Ph.(509)965-8707

August 18,1998

To Whom it may concern;

After reviewing the S.P.D. E.I.S, It is my belief that the decisions to not name Hanford as the primary site for either or both the sites for the MOX Fuels and Immobilization is based solely on POLITICS! It is my opinion that the politicians and D.O.E. department heads that reside in Washington D.C., have once again failed to recognize the true assets of the Hanford Works Area, these being the people and the contributions that they have made to our country over the last fifty years! It is my contention that the bureaucrats in D.C. are afraid to take on the State of Washington, And the Washington Department of Ecology. Since the Honorable Henry M. Jackson passed away, thier have been no new projects at the Hanford Works area related to defense, and all the environmental projects have been delayed or refered to other D.O.E. sites, this political environment has allowed numerous technically advanced projects and facilities to decay to their ruin, F.F.T.F. and F.M.E.F. etc..

To the mater at hand, since F.F.T.F., F.M.E.F. and an already existing D&D work force are already in existence and the vitrification plant slated to be built and on line by the year 2003, I cant understand economically why the Hanford Works wouldn't be the preferred choice site for the MOX Fuels and Immobilization projects. It amazes me that across the river in Oregon a project is on going that poses more danger to the environment and health of people, (Umatilla Army Depot Incinerator Project) than the Hanford works projects now poses, or any future projects will pose! 1

I would like to point out that since 1987, the Hanford works Project has changed its mission from a Department of Defense complex to an Environmental clean-up project, this I believe makes us the leaders in environmental issues and Hanford has a better working knowledge and understanding about environmental issues, I believe that we meet or exceed the other sites in the topics analyzed criteria for the SPD EIS (S.5) pg.S-21 of the summary and should be reconsidered for these projects.

Thank you

Charles L. Lumpkin

FD114

FD114–1 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

MADISON, JIM
PAGE 1 OF 1

Hello, this is Jim Madison from West Pasco. Of course, I grew up as a kid in Richland and stuff like that and spent most of my life there. I personally see no problem with bringing the material back here to dispose of it or whatever. I don't see any problems with transportation and stuff like this, that some of the worry warts are really concerned about because after all the majority of that material originated here. The biggest majority of it got shipped out OK to wherever it went. And I would assume it could be shipped back here the same way with the same care and accident free manner. So I know that some of the hand wringers are going to be all fluttered and everything else, but I hope you really don't pay too much attention to them because most of them really don't know anything about anything anyway except they do make noises on the media. But practically speaking, its the only place to take it. And you will be foolish to take it somewhere else and then have to stockpile it somewhere and build, reduplicate the money for building a building like in the 400 Area that is equipped to do that plus the lead time to wait for the building to be designed and built. So that would push any disposal process several years down the road. And that I think is probably not the best process, not the best procedure either. So all in all, the only thing that makes any sense is to use what you got where it is, which is here. Thank you. 1

PD008

PD008–1 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

MERHAR, DON
PAGE 1 OF 1

I believe that it would be a travesty to bury this very valuable fuel source. DOE would spend billions to prepare it for storage when it could be processed into fuel for commerical nuclear reactors, benefiting all Americans. Various MOX projects are ready to go and should be used to turn weapons materials into electricity. In concept, this is no different than the demobilization of ships, tanks, and planes into commercial materials after WW2. 1

WD004

WD004–1 **MOX Approach**

DOE acknowledges the commentor's support of the MOX approach. The use of MOX fuel in domestic, commercial reactors is not proposed in order to produce electricity. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

MERRILL, DAVID M.
PAGE 1 OF 1

David M. Merrill
513 Wagon Court
Richland, WA 99352
phone: 509 375-8408
E-mail: david_merrill@nfuel.com
4 August 1998

Dear Sirs

I feel the Plutonium Mixed Oxide Fuel fabrication facility should be located on or near the Hanford site, for the following reasons.

First as a chemist and member of the American Chemical Society I am familiar with the talent and skills of many of my colleges who live in this area. Many of these chemists have had experience working with plutonium, and know the safety and handling procedures for both the chemical hazards and criticality safety issues.

Please consider the talent base from which to draw employees when considering where to locate the MOX facility.

Second as Co-president of the "Citizens Advisory Committee to the Richland School Board" I am familiar with the educational concerns and desires of many of the Richland parents. I have worked with parent volunteers to assure our children are given a good education. In this association I have noticed that many of the parents are very interested in providing their children with mathematical, engineering and scientific skills. We would like to see challenging jobs provided for them here. I see the MOX facility as an opportunity for our children to work in an industry we believe in. 1

Please consider the education base of the future employees when considering where to locate the MOX facility.

Third as a quality control chemist I know how important a dry climate is when working with various hygroscopic materials. I realize all facilities handling plutonium use extensive air conditioning systems, but a dry climate provides a much better starting point for facilities which require large amounts of conditioned air. It makes physical sense to locate the MOX facility in this dry climate area where power is inexpensive. As an Example the Siemen's Power Corporation - Nuclear Division facility requires over $1,000,000/year in electricity to operate. A similar MOX facility here would require close to that same amount, but in the south where electricity is more expensive and air conditioning more severe I would guess you are looking at more than 3 times the cost in electricity. 2

Please consider these types of technical and cost details as you review the location for a new MOX facility.

Sincerely

David M. Merrill

David M. Merrill

WAD22

WAD22–1 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

Although the education base of the community is not a factor in facility siting selection, site workforce expertise and the existence of complementary activities and missions are considered. Decisions on the surplus plutonium disposition program at Hanford will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

WAD22–2 **Cost**

Power requirements at each of the candidate sites were taken into consideration, and it was determined that the sites under consideration had sufficient available capacity to cover the needs of the proposed MOX facility.

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

Hello my name is David M. Merrill. I live at 513 Wagon Court, Richland WA 99352. I'm interested in the MOX facility and in the documentation of that MOX facility. I would like to attend the meeting scheduled for tomorrow evening at the Hotel here in Richland. I have some opinions about the plutonium mixed oxide fuel fabrication facility and feel it should be located on or near the Hanford Site for the following reasons: First, as a chemist and member of the American Chemical Society, ACS, I am familiar with the talent and skills of many of my colleagues who live in this area. Many of these chemist have had experience working with plutonium and know the safety in handling procedures for both the chemical hazards and criticality safety issues. Please consider the talent base from which to draw employees when considering where to locate the MOX facility. Second, as co-president of the Citizens Advisory Committee to the Richland School Board, I am familiar with the educational concerns and desires of many of the Richland parents. We love this area and would like to see our children given a broad base education, however, we have a large percentage of parents very interested in providing their children with mathematical, engineering, and scientific skills. We would like to see challenging jobs provided for them here and we see the MOX facility as an opportunity for our children to work in an industry we believe in. Please consider the education base of the future employees when considering 1

where to locate the MOX facility. Third, as a quality control chemist, I know how important a dry climate is when working with various hygroscopic materials. I realize all facilities handling plutonium use extensive air conditioning systems. 2

PD006

PD006–1 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

Although the education base of the community is not a factor in facility siting selection, site workforce expertise and the existence of complementary activities and missions are considered. Decisions on the surplus plutonium disposition program at Hanford will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PD006–2 **Cost**

Power requirements at each of the candidate sites were taken into consideration, and it was determined that the sites under consideration had sufficient available capacity to cover the needs of the proposed MOX facility.

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

MERRILL, DAVID M.
PAGE 2 OF 2

But a dry climate provides a much better starting point for which, for facilities which require large amounts of conditioned air. It makes physical sense to locate MOX facility in this dry climate area where power is less expensive than say down south. As an example, the Seiman's Facility requires over a million dollars per year in electricity to 2
operate. A similar MOX facility here would require close to that same amount. But in the south where electricity is more expensive and air conditioning more severe, I would guess you are looking at three times the cost in electricity. Please consider these types of technical details as a review for location for a new MOX facility.

PD006

United States Department of Energy

Comment Form

NAME: (Optional) David M Merrill
ADDRESS: 513 Wagon Ct
TELEPHONE: (509) 375-8408
E-MAIL: david_merrill@nfuel.com

1) Did you consider converting to oxide at Pantex and using the comercial work force to run the MOX facility at FMEF, and sending immobilization to SRS? 1

2) Is there a potential for much more Pu either from within the US or even offer to convert foreign Pu to MOX. 2

For further information contact: Department of Energy, Office of Fissile Materials Disposition, [illegible] Building, 1000 Independence [illegible], SW, Washington, [illegible] 1-800-820-5156

WAD09

WAD09–1 **Alternatives**

The range of reasonable alternatives analyzed in this SPD EIS were developed using criteria listed in Section 2.3.1. The alternative suggested by the commentor was considered and eliminated because it involves placing the three proposed surplus plutonium disposition facilities at three different sites.

WAD09–2 **DOE Policy**

The end of the Cold War has resulted in unprecedented reductions in nuclear arms in both the United States and Russia. During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile. Further agreements on disarmament between the two nations may increase the amount of surplus plutonium in the future.

Understanding the economic dilemma in Russia, the U.S. Congress has appropriated funding for a series of small-scale tests and demonstrations of plutonium disposition technologies jointly conducted by the United States and Russia. For fiscal year 1999 (starting October 1998), Congress further appropriated funding to assist Russia in design and construction of a plutonium conversion facility and a MOX fuel fabrication facility. This funding would not be expended until the presidents of both countries signed a new agreement. Although the amount appropriated by Congress is not sufficient to fund the entire Russian surplus plutonium disposition program, the United States is working with Russia and other nations to resolve this issue.

MOORE, VICTOR AND ROBERTA
PAGE 1 OF 1

From Victor + Roberta Moore
9149 W. Clearwater Pl.
Kennewick, WA. 99336
8/4/98

Concerning a Draft Environmental Impact statement to expand the Role of Hanford in plutonium Disposition.

After years of inadequate funding to clean up Hanford – why would Anyone want to expand Facilities to accomodate Materials sent from other places? 1

What evidence does anyone have that by getting more processes + more materials, that the old waste Disposal problems will be Addressed + Funded?

Contaminated Environments should Not be Looking for MORE contaminates if clean up is a priority.

WAD06

WAD06–1 **Alternatives**

DOE acknowledges the commentor's opposition to the surplus plutonium disposition program at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

August 4, 1998 Public Meeting Comments on
Surplus Plutonium Disposition Draft Environmental Impact Statement

Good Evening. My name is Walt Apley and I am the Deputy Director for Operations at the Pacific Northwest National Laboratory. One of the Laboratory's primary missions is to help apply Hanford Site assets to emerging national and international needs as well as new science-based missions. Given that role, I would like to offer three specific comments on the Surplus Plutonium Disposition Draft Environmental Impact Statement:

(1) Importance of Plutonium Disposition

There are few issues today in the world as important as safely and securely withdrawing plutonium from nuclear military programs and taking steps to ensure that such material can never again be used to build a nuclear weapon. To that end, Pacific Northwest National Laboratory staff are working in a wide range of technical areas, including detection, safe handling, and disposition - both in the United States and internationally. The EIS for Surplus Plutonium Disposition is an extremely important document that we all want to see completed as a sound, technically-defensible basis for moving forward for the timely disposition of this material. 1

(2) Role of Hanford

Currently the Draft EIS states a preference for using the Savannah River Site. Hanford was not selected, with one of the arguments being that DOE prefers that the cleanup mission remain Hanford's top priority. The cleanup mission is and will remain this site's #1 and overriding priority. But Hanford does have major assets (both physical and personnel) which are capable of making major contributions to the surplus plutonium disposition mission. The DOE budget will continue to face significant pressure and since existing facilities such as the Fuels and Materials Examination Facility may be able to do the job sooner and at a lower cost, we must retain the ability to use those resources. 2

(3) Fast Flux Test Facility

Currently the draft EIS states that DOE's preference is to produce MOX fuel and "irradiate in existing, commercial reactors". However, the U.S. - Russian Agreement on Management of Used Plutonium announced at the Gore-Kiriyenko working meeting on July 23-24, 1998 called for using "MOX fuel for nuclear power reactors of various types". Studies have shown that the Fast Flux Test Facility, if dedicated to the mission, could disposition the 33 *t* of surplus weapons plutonium well within the 25 year *Storage and Disposition Final PEIS* criterion using traditional enrichments and a standard core configuration, as well as produce valuable and needed medical isotopes. The FFTF disposition option should be given strong consideration. 3

I'd like to thank the people putting together this draft EIS: I know that it is both a challenge and an ordeal. But it is also critically important to a safe and secure future for all of us. Thank you.

WAD21

WAD21–1 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's reviews on the importance of this SPD EIS.

WAD21–2 **Alternatives**

DOE acknowledges the commentor's support for the surplus plutonium disposition program at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

WAD21–3 **Alternatives**

DOE acknowledges the commentor's support of using MOX fuel to restart FFTF at Hanford. As discussed in Appendix D of the SPD Draft EIS, DOE did consider FFTF in the Storage and Disposition PEIS, but it was eliminated from further study because it was in a standby status and it could not satisfy the criterion of completing the disposition mission within 25 years using the historic FFTF plutonium enrichment specifications. Further, compared with the 2-3 percent plutonium content of spent fuel from commercial reactors, the spent fuel from FFTF would contain approximately 35 percent plutonium by weight. It is questionable whether this greater concentration of plutonium in the FFTF MOX spent fuel would meet repository acceptance criteria. Also, the FFTF liquid-metal reactor would not produce electricity, whereas using commercial light water reactors to dispose of surplus plutonium would generate revenues from the sale of electricity, which in turn would help defray the overall cost of using the MOX approach. As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source.

PEARSON, CHRISTINE
PAGE 1 OF 4

US DOE needs to hear your voice NOW!

1. Should Clean Up be the sole mission at Hanford?
Yes No 1

2. Should the United States Government maintain its longstanding policy against the use of weapons Plutonium to fuel civilian nuclear reactors?
Yes No 2

3. Which alternative would you prefer to see the US Department of Energy pursue:
Immobilization (encasement of plutonium in glass-like tombs) Immobilization !!
Or
~~The MOX plan (burning plutonium to fabricate fuel for use in a civilian nuclear reactor)?~~ 3

4. Should Plutonium, to be used for processing and fabrication of MOX fuel, be imported to the Hanford site along the Columbia River?
Yes No

5. How concerned are you about the transportation of Plutonium ~~through~~ the Northwest? 4
Not concerned slightly concerned very concerned completely opposed
B. How concerned are you about the transport through the Northwest of fuel containing weapons Plutonium?
Not concerned Slightly concerned Very concerned Completely opposed

6. Should commercial nuclear power plants be allowed to run on MOX fuel containing weapons Plutonium?
Yes No 5
B. Should they be subsidized with tax dollars to do so?
Yes No

7. Should MOX fuel containing weapons Plutonium be used to restart the FFTF reactor at Hanford to produce Tritium for nuclear bombs? 6
Yes No

Name Christine Pearson
Address #8 Strong Rd.
Phone Trout Lake, Wa. 98650

Please return this to:
Hanford Action
25-6 NW 23rd Place #406
Portland, OR 97214
(503) 235-2531

MD296

MD296–1 **DOE Policy**

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

MD296–2 **Nonproliferation**

U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

MD296–3 **Alternatives**

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Under the hybrid approach, approximately 33 t (36 tons) of clean plutonium metal and oxides would be used to fabricate MOX fuel, which would be irradiated in domestic, commercial reactors. DOE has determined that 17 t (19 tons) of the surplus plutonium would be immobilized due to the complexity, timing, and cost that would be involved in purifying those plutonium materials to make them suitable for use in MOX fuel. Therefore, fabricating all 50 t (55 tons) of surplus plutonium into MOX fuel is not considered a reasonable alternative at this time and is not analyzed; however, immobilizing all of the surplus plutonium is analyzed. Given the variability in purity of the surplus plutonium to be dispositioned, some of the plutonium currently considered for MOX fuel fabrication may also need to be immobilized. The incremental impacts that would be associated with a small shift in materials throughput are discussed in Section 4.30.

MD296–4 **Transportation**

The shipment of nuclear material (e.g., depleted uranium) using commercial carriers would be the subject of detailed transportation plans in which routes and specific processing locations would be discussed. These plans are coordinated with State, tribal, and local officials. The shipment of waste would be in accordance with the decisions reached on the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). The transportation of special nuclear materials is the subject of detailed planning with DOE's Transportation Safeguards Division. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in this SPD EIS. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

MD296–5 **MOX Approach**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

MD296–6 **DOE Policy**

As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source. In December 1998, the Secretary of Energy decided that FFTF would not play a role in producing tritium.

Additional Comments:

We need to continue to stop the madness of Nuclear proliferation & spend $'s on Research on cleaning up waste sites. The Tri cities area is one of the highest incidence areas of Cancer in the Nation. The Hanford being so close to the River is and has created a distribution system for Nuclear leaks & waste products. 7

More energy needs to be devoted to alternative power sources such as solar & wind generated power. Also we need more education to help people understand how to use less energy & conserve more energy so there is not as much demand for Nuclear power. 8

MD296

MD296–7 **DOE Policy**

DOE is implementing the President's nonproliferation policy by converting surplus plutonium to forms that cannot be reused in nuclear weapons again. Cleanup of DOE's former weapons production sites including research and development has continued to receive substantial funding allocations from the U.S. Congress every year. Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably.

MD296–8 **DOE Policy**

DOE acknowledges the commentor's support for alternative energy sources. The purpose of the surplus plutonium disposition program is not to provide an alternative source of energy but to disposition plutonium in an environmentally safe and timely manner. Further, DOE acknowledges and supports the importance of public education. DOE has established reading rooms near DOE sites to provide easy access to information about DOE programs and encourages the use of this source of information. DOE has numerous Web sites, including one for MD (http://www.doe-md.com), that also provide up-to-date information about DOE programs. Likewise, a number of utilities also have their own Web sites with educational material.

RICHLAND
PAM BROWN
PAGE 1 OF 1

MEMORANDUM *CITY OF RICHLAND*
City Manager's Office

TO: Brook Anderson

FROM: Pam Brown, Hanford Analyst

SUBJECT: Response to an Invitation From Secretary Peña to Send Him Information about Cost & Schedule Savings of Locating Plutonium Disposition Functions at Hanford and Documentation of a DOE-HQ Bias Towards Savannah River in the Previous Fissile Material EIS

DATE: October 17, 1997

When Secretary Peña visited Hanford, the local elected officials discussed our strong interest in seeing existing Hanford facilities used for plutonium disposition functions. We pointed out the significant time and schedule savings of using existing Hanford facilities that were built to house mixed oxide fuel fabrication, rather that build new facilities at another site.

We explained that in observing the process followed in developing the Fissile Material Environmental Impact Statement (EIS) last year, we believe that there was a clear bias on the part of Materials Disposition Staff towards placing these functions at the Savannah River Site. In the current EIS process, MD staff are discrediting the usefulness of our Fuels & Materials Examination Facility (FMEF) by ignoring and even denying the existence of reports that explain in detail the capabilities of FMEF. 1

Secretary Peña invited us to send him a package of material documenting the capabilities of our Hanford facilities. He also asked that we provide documentation of what we believe is a clear bias by DOE-HQ staff in favor of the Savannah River Site. He asked that we send this package to you so that it would actually get to him.

The documents enclosed have been submitted by our communities, DOE-Richland and the Siemens Power Corporation to the Office of Fissile Materials Disposition over the last year and a half. Due to the large volume of material we are sending, I have tried to highlight the information that is of most concern. If you have any questions about our position or the documents enclosed please call me at 509-943-7348.

WAD16

WAD16–1 **Alternatives**

DOE acknowledges and appreciates the commentor's continued interest in the surplus plutonium disposition program, and support for siting the proposed surplus plutonium disposition facilities at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for surplus plutonium disposition facilities. The use of FMEF in the surplus plutonium disposition program is considered in this EIS under Alternatives 2, 4, 6, 8, 10, and 11. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

The attachments to the commentor's letter represent comments previously submitted and reviewed by MD, and thus addressed in separate responses at that time.

Gordon J. Rogers
1108 N Road 36
Pasco, WA 99301
Phone/ Fax 509 547-7403

September 16, 1998

Mr. Howard R. Canter
Acting Director
Office of Fissile Materials Disposition
U.S. Department of Energy
P.O. Box 23786
Washington, DC 20026-3786

Dear Mr. Canter:

I submit the following comments on the Surplus Plutonium Disposition Draft Environmental Impact Statement.

I find the preferred alternatives for the subject EIS to be fatally flawed and completely unacceptable for the following reasons.

- Cost savings from the use of the FMEF at Hanford are not considered.
- The cleanup mission is critical at all the candidate sites. No evidence is given to support the dismissal of Hanford, and the implication is that cleanup at SRS is not equally vital. New missions at a site are accommodated by management actions, and are not an environmental issue.
- There is essentially no difference between the sites in terms of environmental impacts. Therefore, we taxpayers demand that least cost to the government should be the deciding factor.
- The transportation impacts are essentially the same if the pit disassembly and conversion and the MOX fuel fabrication are located at the same site. The statement that the FMEF cannot house both function without new construction is not supported by available studies.

1

The draft EIS is not a balanced and objective assessment and does not provide a legitimate basis for a decision. Instead, it omits comparative costs and makes unjustified assumptions favoring the SRS site. An objective evaluation of comparative costs must be made; and the document

2

MD241

MD241–1 **Alternatives**

DOE acknowledges the commentor's opposition to the announced preference for siting immobilization and MOX facilities at SRS rather than at Hanford. The preferred alternative was chosen based on the best information and analyses available; all sites were equally considered based on this information. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

MD241–2 **General SPD EIS and NEPA Process**

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for proposed surplus plutonium disposition facilities.

ROGERS, GORDON J.
PAGE 2 OF 2

must be extensively revised to have a credible basis for site selection. | 2

I will appreciate receiving a copy of the response to comments and any future documents on this subject.

Sincerely,

Gordon J. Rogers

MD241

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. Cost impacts are addressed in the reports identified in response MD241–1.

ROYAL, STEVE
PAGE 1 OF 1

United States Department of Energy

Comment Form

AUG 23, 1998

NAME: (Optional) STEVE ROYAL

ADDRESS: PO BOX 4871 VANCOUVER, WA 98662

TELEPHONE: ( )

E-MAIL: RE: SURPLUS PLUTONIUM DISPOSITION DRAFT ENVIRONMENTAL IMPACT STATEMENT

U.S. DOE OFFICE OF FISSILE MATERIALS DISPOSITION

I'm TELLING YOU THIS:

1) I DO NOT WANT NOR NEED A UNITED STATES WHICH IS ENGAGING, DANGEROUSLY, IN THE PROLIFERATION OF NEUCLEAR (LONG ½ LIVES) MATERIAL WHICH HAS NO ABILITY TO BREAKDOWN & BE ERADICATED AFTER ASSEMBLY.

2) I DO NOT WANT NOR NEED A UNITED STATES WHICH IS ENGAGING & OR APEARS TO BE ENGAGING IN THE COMINGELING OF NEUCLEAR (LONG ½ LIVES) MATERIAL.

3) I DO NOT WANT NOR NEED A UNITED STATES WHICH IS ENGAGING & OR APEARS TO BE ENGAGING IN THE MOVEMENT OF NEUCLEAR (LONG ½ LIVES) MATERIAL ON THE U.S. INTERSTATE ROADS, HIGHWAYS, & COUNTY ROADS; ON U.S. WATERWAYS OR INTERNATIONAL WATERWAYS. ON RAILROAD LINES; OR IN THE AIR TRAFFIC LANES ANYWHERE. 1

4) GET OUT OF THE U.S. MILITARY/MONOPOLY ENERGY/GRADUATE COLLEGE RESEARCH/CORPORATE WELFARE INDUSTRIAL COMPLEX SYNDROM BUSINESS, IN ORDER TO SAVE OUR ONE & ONLY EARTH FROM THE MOST LETHAL POISION KNOWN.

S.R.

FD143

FD143–1 **DOE Policy**

DOE acknowledges the commentor's opposition to nuclear material management. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. This would require the handling and transportation of the surplus plutonium. Transportation of special nuclear materials would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material.

SEYER, SAUL
PAGE 1 OF 1

Saul Seyler
Holden Village
HC00 Stop 2
Chelan, WA 98816

Secretary of Energy;
U.S. Department of Energy
1000 Independence Avenue, SW
Washington D.C. 20585

Dear Secretary:

I'm writing in concern to the burning of MOX Fuels, at sites such as Hanford. This is unacceptable and cannot continue. The preservation of our environment is by far more important than the additional energy that can be gained. It is better to dispose of the stuff now instead of increasing the toxicness of it. Thank you for your understanding on the matter. 1

Sincerely, A concerned voter,

Saul Seyler

FD330

FD330–1 **Alternatives**

DOE acknowledges the commentor's opposition to the MOX approach. Use of MOX fuel in domestic, commercial reactors is not proposed in order to produce electricity. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. With immobilization or MOX, the material would be disposed of in the same potential geologic repository.

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

STMC Sisu Technical and Management Consulting
Ronald C. Liikala
Page 1 of 3

Re: Comments on the Plutonium Disposition Draft Environmental Impact Statement

I provided oral comments at the meeting in Richland, Washington on the Draft EIS and stated that I would submit my comments in writing, which are on the attached 2 pages.

Ronald C. Liikala Ron Liikala
STMC Sisu Technical and Management Consulting
718 Lynnwood Loop
Richland, WA. 99352

FD320

My three principal concerns about the draft EIS are 1) the alternatives selected for evaluation, 2) omission of a cost-benefit analysis, and 3) the justification for locating the MOX fuel fabrication facility at SRS.

1) The alternatives evaluated omits what appears to me to be a reasonable alternative, namely:
   - Pu Disassembly and Conversion at Pantex;
   - MOX Fuel Fabrication in the FMEF at Hanford;
   - Pu Conversion and Immobilization at SRS.

Section 1502.14 of 40 CFR Chapter V states, "agencies shall rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their being eliminated." 1

The reason why I believe it is reasonable is because it takes advantage of existing infrastructure (i.e., Pit storage at Pantex, the FMEF at Hanford, and the capabilities at SRS for storing and converting nonpit plutonium materials into plutonium dioxide suitable for immobilization coupled along with the immobilization capabilities at SRS. Completion of the existing FMEF for fabricating MOX fuel should cost less than building a new fuel fabrication facility at any of the DOE sites.

2) A cost-benefit analysis was not included in the draft EIS. I question whether the omission of such analysis is in keeping with the letter/spirit of NEPA.

I refer you to the Final Generic Environmental Statement on Use of Recycle Plutonium in Mixed Oxide Fuel in Light Water Cooled Reactors issued by the NRC in August 1976.

In a January 20, 1975 letter to the NRC, the Presidents Council on Environmental Quality expressed the view that, the draft EIS was incomplete because it failed to present a detailed and comprehensive analysis of the environmental impacts of potential diversion of special nuclear materials and of alternative safeguards programs to protect the public from such a threat. The Council believed that such a presentation should be made by the NRC before its final decisions on plutonium recycle. Reflecting on this, the NRC took the position that a cost-benefit analysis of alternative safeguards programs should be prepared and set forth in draft and final environmental impact statements before any Commission is reached in draft and final environmental impact statements. 2

FD320

FD320–1 **General SPD EIS and NEPA Process**

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for surplus plutonium disposition facilities.

As discussed in Section 2.3.1 of the SPD Draft EIS, the range of reasonable alternatives analyzed was developed using equally weighted screening criteria. Over 64 options were evaluated, yielding a range of 23 reasonable alternatives that met all the criteria. Options that involved siting the proposed surplus plutonium disposition facilities at three different sites were eliminated because the goals of minimizing worker and public exposure to radiation, minimizing proliferation concerns associated with transportation, and reducing infrastructure costs would not be met.

FD320–2 **Cost**

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

I believe that the draft EIS is incomplete without including the alternative on Pit Disassembly and Conversion at Pantex, MOX fabrication in FMEF at Hanford and Pu Conversion and Immobilization at SRS and by not including a cost-benefit analysis of alternatives. 2

3) The draft EIS makes mention SRS is preferred for the MOX facility because this activity complements existing missions and takes advantage or existing infrastructure and staff expertise. There was no delineation of in the draft EIS how it compliments existing missions or takes advantage of existing infrastructure and staff expertise. Since the MOX facility will be leased to the contractor and the contractor is responsible for obtaining a license from the Nuclear Regulatory Commission (NRC), I am wondering about why DOE feels its field office and current site contractors will have a significant role in the construction and operation of the MOX facility. For example, here at Hanford, the Washington Power Supply System (WPPSS) leases the site for its plants from DOE and the role of the field operations office is basically limited to site-wide emergency planning. Safety, safeguards and security at the WPPSS site at Hanford are the under the purview of NRC. 3

FD320

FD320–3 **Alternatives**

DOE does not plan for facility site contractors to have a significant role in the construction and operation of the MOX facility. The MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

DOE entered into a contract with DCS to construct and operate the MOX facility at one of the four candidate sites evaluated in this SPD EIS. This contract was awarded through a competitive procurement process. Since the MOX facility would use existing site services and infrastructure, the site contractor would be responsible for supporting the construction and operation of the facility to the extent required to ensure availability of those services. The DOE field office would also be involved to a limited extent, in its oversight role for the entire DOE site, and for services such as those identified by the commentor.

SUNDSTROM, GLENN
PAGE 1 OF 1

DEPT. OF ENERGY
OFFICE OF FISSILE MATERIALS DISPOSITION
P.O. BOX 23786
WASHINGTON, D.C. 20026-3786

8/13/98

GENTLEPEOPLE:

I OPPOSE ANY USE OF MOX FUEL IN CIVILIAN OR COMMERCIAL REACTORS IN THE UNITED STATES, AS LONG AS THE LIMIT OF LIABILITY CLAUSE IS INCLUDED IN ANY FEDERAL LEGISLATION SUCH AS THE PRICE ANDERSON ACT.

PUBLIC REACTION WAS DECISIVE IN 1994 WHEN MR FERGUSON AND HIS "ISSIAH" PROJECT WERE TOLD TO COME BACK TO GRAYS HARBOR WITH THEIR PROPOSAL TO "BURN" PLUTONIUM, AT THE THEN DECOMISSIONED WPPSS #3 AND #5 SITE AT SATSOP, WHEN THEY (COLUMBIA NUCLEAR) HAVE BECOME SUCCESSFUL IN REMOVING THE LIMIT OF LIABILITY CLAUSE IN THE PRICE ANDERSON ACT. 1

EVERY CITY COUNCIL, HOQUIAM, ABERDEEN, MONTESANO, ELMA AND McCLEARY GAVE MR FERGESON THE SAME MESSAGE. "WHEN YOU THE BONDHOLDERS, STOCKHOLDERS AND CEO'S ASSUME THE LIABILITY LIKE ANY OTHER AMERICAN INDUSTRY, THEN WE WILL WELCOME YOU WITH OPEN ARMS."

SINCERELY,
Glenn Sundstrom O.D.
45 E SATSOP RD.
ELMA, WA 98541

360 482 5120

MD088

MD088–1 **MOX Approach**

DOE acknowledges commentor's opposition to the use of MOX fuel in domestic, commercial reactors.

TEAL, JOSEPH
PAGE 1 OF 2

United States Department of Energy

TO: OFFICE OF FISSILE MATERIALS DISPOSITION @fax 1-800-820-5156

Comment Form

Page 1

NAME: (Optional) Joseph Teal
ADDRESS: 86103 N. YAKIMA RIVER DRIVE ; WEST RICHLAND, WA. 99353
TELEPHONE: (—) —
E-MAIL: —

COMMENTS ON THE DRAFT SURPLUS PLUTONIUM DISPOSITION ENVIRONMENTAL IMPACT STATEMENT

These comments document my amazement at and protest of the recent decision to construct new facilities for pit disassembly and mixed-oxide fuel fabrication at Pantex and Savannah River rather than take advantage of existing facilities. The justifications for construction of new facilities that were presented in the PEIS, particularly the cost estimates and transportation issues, are so notably wrong as to display departure from sound judgment and common sense. Careful review of the analyses in these two areas may reveal a contrived backfit to justify a predetermined decision. It is requested that an unbiased independent review of these two justifications be performed by an agency such as the OMB.

Over the past 20 or so years, the U.S. Department of Energy has launched projects involving approximately one hundred new major facilities. Of these, perhaps twenty-five have actually been started, a dozen have been completed, and of the twelve, over half have either failed to perform due to technical inadequacies or have never been used due to program direction change. Notable examples of plans and/or intentions gone awry include the 371/374 Buildings at Rocky Flats, the PF-41 Storage Vault at Los Alamos, the Fuels and Materials Examination Facility (FMEF) at Hanford, the Fuel Processing Facility at INEEL, the New Special Recovery Facility at SRS, etc. It is hoped that DOE does not repeat or continue this cycle. (continued on page 2 →) 1

FD301

FD301–1 **Cost**

DOE acknowledges the commentor's support for involving existing facilities such as FMEF at Hanford to disposition surplus plutonium. However, according to a technical review of available facilities and an independent cost study, constructing new facilities is the option involving the least risk and the best use of DOE's limited resources. Frequently it is more expensive to try to retrofit for a particular mission a building that was originally designed for another mission. While it is true that FMEF was originally designed to produce MOX fuel for FFTF, it was not designed to accommodate a pit conversion facility as well. Space requirements would make it extremely difficult to use the facility for two missions.

Location of the MOX facility in FMEF by itself was never considered because locating a single proposed facility at three different sites would not meet the screening criteria of minimizing worker and public exposure to radiation, minimizing proliferation concerns associated with transportation, and reducing infrastructure costs.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

TEAL, JOSEPH
PAGE 2 OF 2

United States
Department
of Energy

Comment Form
Page 2

NAME: (Optional) Joseph Teal
ADDRESS: —
TELEPHONE: (–) —
E-MAIL: –

These major facility acquisition efforts have averaged expenditures in the range of one-half billion dollars per year for the last twenty years.

How comes another acquisition program to build all-new facilities for disassembly of weapons pits, fabrication of mixed-oxide fuel, and storage of plutonium? 1

DOE's failure to make use of existing facilities, particularly the FMEF at Hanford, for this work displays egregious disregard and departure from common sense and sound conduct of business.

Additionally the DOE arbitrarily refused to consider and analyze the use of the WNP-1 Support Building for this work. This facility, in combination with the FMEF offers an abundance of readily available, clean, hardened, NRC licensable space that eliminates the need for any new construction and thus poses very substantial cost savings with no environmental impacts. 2

CC: ATTENTION: DOC HASTINGS
@fax 1-202 225-3251

FD301

FD301–2 **Alternatives**

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

TRIDEC TRI-CITY INDUSTRIAL DEVELOPMENT COUNCIL

901 N. Colorado, Kennewick, WA 99336-7685 USA 1-800-TRI-CITY 509-735-1000 509-735-6609 fax tridec@owt.com www.owt.com/tride

STATEMENT REGARDING THE
DEPARTMENT OF ENERGY'S DRAFT
ENVIRONMENTAL IMPACT STATEMENT
FOR
SURPLUS PLUTONIUM DISPOSITION
RICHLAND, WASHINGTON
AUGUST 4, 1998

Thank you for the opportunity to present the views of our organization on this issue, which is of great importance to the Tri-City area. The Tri-City Industrial Development Council (TRIDEC) is a local non-profit organization whose interests are in the economic development and vitality of this area. Our membership is composed of over 500 local business firms, individuals and organizations having a commitment to the Tri-City area.

As we have indicated in previous statements and testimony on this subject, we support the plans to vitrify and dispose of the scrap plutonium containing materials in a national repository. We also support the Department's plans to dispose of the excess plutonium by irradiation in a commercial power reactor through the use of a mixed oxide fuel (MOX). 1

However, we have substantial and significant concerns with the adequacy, objectivity, and balance evident in the Draft EIS that we are commenting on tonight. This document as written is so faulted that it should be withdrawn and extensively revised to reflect a comprehensive and balanced assessment of the siting alternatives for the plutonium disposal program in accordance with NEPA program requirements. The document as written does not provide such an assessment. I will illustrate some of our concerns in this regard. 2

- Scrap Plutonium Immobilization Facility

  The draft EIS states that a selection of Savannah River as the site for this facility was made in 1997 in the NOI for this EIS. This selection decision was made in effect without the performance of EIS evaluations. 3 A review of the site impacts contained in this Draft EIS does not show any significant difference between the sites from the construction of new immobilization facilities. Consideration was not given in this Draft EIS to the construction of new plutonium storage facilities at Savannah River to support the scrap disposal program.

  It is recognized that Savannah River currently has a waste vitrification facility, the DWPF, in operation, which would be utilized to encase the solidified plutonium disposal capsules. 4

1

WAD18

WAD18–1 **Alternatives**

DOE acknowledges commentors' support for the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself.

WAD18–2 **General SPD EIS and NEPA Process**

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for surplus plutonium disposition facilities.

WAD18–3 **General SPD EIS and NEPA Process**

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). In accordance with CEQ Section 1502.14(e), DOE identified its preferred alternative in the SPD Draft EIS so the public could understand DOE's orientation and provide comment. Prior to the SPD Draft EIS being published, DOE indicated using the can-in-canister technology at SRS would be part of DOE's preferred alternative for immobilization. Although SRS has been identified as the preferred site for the immobilization facility, this is only DOE's preference; it is not a decision. Decisions on the surplus plutonium disposition program at INEEL will be based on public input, environmental analyses, technical and cost reports, and national policy and nonproliferation considerations. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

TRI-CITY INDUSTRIAL DEVELOPMENT COUNCIL
PAGE 2 OF 6

Hanford is in the process of awarding contracts for the construction of a waste vitrification facility for the processing of its tank wastes, which could perform this same function. 4

The comparative environmental impacts at the two sites for the new facilities were essentially equal. The additional cost for new plutonium storage facilities at Savannah River were apparently not a factor in this evaluation. 5

- MOX Fuel Fabrication Facility

The decision to locate this facility at Savannah River in preference to Hanford is based upon the administrative decision that this program would complement other Savannah River site missions and utilize existing site infrastructure and site expertise. Since DOE is currently soliciting proposals from vendors for the installation and operation of the MOX process in DOE provided facilities, this logic is questionable to say the least since Savannah River has not had previous experience with either MOX fuels or commercial reactor fuel development or manufacturing. 6

Another example of the lack of objectivity in this report is the utilization of a commercial $UF_6 - UO_2$ commercial facilities located in North Carolina in the evaluations of Hanford. Commercial facilities, which are located in Richland, should have been utilized in the Hanford evaluations to provide a balanced perspective. 7

The most significant issue; however, is the lack of a cost comparison between utilization of the existing Fuels and Materials Examination Facility (FMEF) at Hanford and the construction of a new MOX manufacturing facility at Savannah River. In a time of limited DOE budget the added costs for new unnecessary facilities can only reduce the already constrained Environmental Management cleanup program funding. We understand that DOE has studies available, which identify the potential cost savings available from the siting of this facility in the FMEF. These studies should be available for public review, rather than not addressing this issue in the Draft EIS. 8

A final issue is the rationale that the Hanford cleanup program is critical and should not be distracted by new programs at Hanford. Savannah River has a critical cleanup program underway which is of approximately the same yearly size as the Hanford program. What we are really addressing in this case is management effectiveness and available EM program funding. 9

The Governor of the State of Washington, Gary Locke, has stated in a letter to Secretary Peña that he would accept a MOX program at Hanford so long as DOE cleanup program commitments under the TPA are met. (Copy attached for entry into hearing record.)

WAD18

WAD18–4 **Alternatives**

For immobilization alternatives, modification of FMEF at Hanford was considered, with construction of new immobilization facilities considered only at SRS. In addition, this SPD EIS analyses assume that either the SRS DWPF or the Hanford HLWVF would be available to support canister-filling immobilization operations associated with the surplus plutonium disposition program. DOE is presently considering a replacement process for the in-tank precipitation (ITP) process at SRS. The ITP process was intended to separate soluble high-activity radionuclides (i.e., cesium, strontium, uranium, and plutonium) from liquid HLW before vitrifying the high-activity fraction of the waste in DWPF. The ITP process as presently configured cannot achieve production goals and safety requirements for processing HLW. Three alternative processes are being evaluated by DOE: ion exchange, small tank precipitation, and direct grout. DOE's preferred immobilization technology (can-in-canister) and immobilization site (SRS) are dependent upon DWPF providing vitrified HLW with sufficient radioactivity. DOE is confident that the technical solution will be available at SRS by using radioactive cesium from the ion exchange or small tank precipitation process. A supplemental EIS (DOE/EIS-0082-S2) on the operation of DWPF and associated ITP alternatives is being prepared.

WAD18–5 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

WAD18–6 **Alternatives**

The preferred alternative for siting the MOX facility at SRS was chosen based on the best information and analyses available; all sites were equally considered based on this information.

WAD18–7 **MOX Approach**

Depleted uranium dioxide is required for the ceramic immobilization of plutonium, and can be used for the fabrication of MOX fuel. It could be produced at a commercial site by the conversion of uranium hexafluoride shipped from one of DOE's storage areas at a gaseous diffusion plant in Kentucky, Ohio, or Tennessee. The GE Nuclear facility in Wilmington, North Carolina was used for the purpose of determining the potential environmental impacts of the conversion of uranium hexafluoride to uranium dioxide as part of the surplus plutonium disposition program (see Section 1.5). Results of the environmental analysis indicate that the radiological risks of shipping either depleted uranium hexafluoride or depleted uranium dioxide would likely be minor, and would contribute little to the total risk of any alternative. The decision on the source of uranium dioxide will depend on DCS, the team selected by DOE to provide the MOX fuel fabrication and irradiation services.

WAD18–8 **Cost**

Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. The remainder of this comment is addressed in response WAD18–5.

WAD18–9 **Alternatives**

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

- Pit Disassembly and Conversion

  Hanford was again not considered for this portion of the plutonium disposition program on the bases of site cleanup and transportation issues. We have addressed the site cleanup program issue above. 9

  In regards to transportation, the Draft EIS displays an unusual display of creative but fallacious logic in regards to transportation. By making the decision to site the MOX facility at Savannah River, the location of the Pit facility at Hanford would entail an extra transportation step to move the pits from storage at Pantex to Hanford for disassembly and conversion and then to Savannah River for MOX fuel manufacturing. This ignores the more logical and economical approach of co-locating both the MOX fuel manufacturing and pit conversion facilities in the FMEF at Hanford. This dual utilization of both processes at Hanford would provide capital cost savings of over $500M. This potential cost savings cannot be ignored. The current Draft EIS does not address the cost issue. We understand that there is adequate space available in the FMEF for both of these process facilities with appropriate separation to meet anticipated security and safeguards requirements. 10

We wish to make the following general statements in regards to this Draft EIS.

- The draft EIS statement does not address the comparative costs of the preferred alternatives. By eliminating this analysis the capital cost savings, which could be realized by use of the Fuels and Materials Examination Facility (FMEF) at Hanford for the pit conversion and MOX fuel manufacturing operations, have been ignored. Previous studies have identified these savings at over $500 M in capital cost alone. 11
- In considering inter-site transportation issues the EIS identifies an additional 2300 truck shipments which would be required over the 15 year estimated life of the program for location of the plutonium disposition facilities at Hanford. The comparable number of shipments to the Savannah River site is estimated at 2500 over the same 15-year program life. This leads to the conclusion that with both the new MOX and pit conversion facilities located at one site there are no differences between the sites. 12
- The draft EIS analyses a number of environmental issues for each of the four sites, Hanford, Savannah River, INEEL, and Pantex. Although there are some differences between the sites for the various environmental impacts considered, these differences are not significant and no site is clearly less or more acceptable than the others from an environmental standpoint. 13
- In the case of Hanford, the report assumes that a new spent MOX facility will be required to be constructed adjacent to the FMEF, with the pit conversion process installed in the FMEF. Previous Hanford studies have shown that both of these operations can be accommodated within the FMEF with an adequate degree of security and process isolation provided. 14
- Based upon current congressional budget policies the total DOE budget will be held essentially flat or decreasing for the foreseeable future. In order to accommodate potentially expensive programs such as the plutonium disposition and tritium production programs, it is 8

WAD18

WAD18–10 **Alternatives**

DOE acknowledges the commentor’s support for siting the pit conversion and MOX facilities using FMEF at Hanford. Of all the alternatives analyzed in this SPD EIS, none include siting the pit conversion facility at Hanford and the MOX facility at SRS.

The remainder of this comment is addressed in response WAD18–5.

WAD18–11 **Cost**

This comment is addressed in response WAD18–5.

WAD18–12 **Transportation**

DOE recognizes that there is not a significant difference in the number of intersite truck shipments if all of the proposed surplus plutonium disposition facilities were located at one site, either Hanford or SRS. However, there are larger differences, but still not significant, between some of the other alternatives analyzed in this SPD EIS.

WAD18–13 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor’s position on the lack of significant differences in the environmental impacts of the alternatives reflected in this SPD EIS. A separate report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), analyzes the cost and schedule estimates for each alternative, and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), covers recent life-cycle cost analyses associated with the preferred alternative. These reports, along with the SPD EIS and other relevant documents, will be available to the decisionmaker and the public. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

WAD18–14 **Alternatives**

DOE agrees that both the pit conversion and MOX facilities could be collocated in FMEF at Hanford, and has analyzed this scenario as Alternative 6B (see Sections 2.10.2 and 4.11). Also analyzed, as Alternative 6A, is a scenario that involves siting the pit conversion facility in FMEF and the MOX facility in new construction adjacent to FMEF.

expected that the Environmental Management budget, which is a major portion of the total DOE budget will be utilized in part for the required funding for these programs. Reductions in the EM budget will impact Hanford cleanup programs, which are already underfunded. Therefore, we do not see how the issue added program costs for the plutonium disposition program can be ignored in an environmental assessment of the plutonium disposition program. 8

- There are a number of other issues in the Draft EIS where assumptions have been made which are clearly prejudicial to a balanced and objective evaluation of the alternatives. In the case of the supporting depleted uranium UF_6 to UO_2 conversion process it would be located in North Carolina at an existing commercial facility due to its proximity to Savannah River. A similar facility located at the Siemens plant in Richland was not considered in the Hanford or INEEL evaluations. 7

- The rationale for focusing on Savannah River or Pantex for the proposed facilities was based upon the need for DOE management to focus on cleanup program issues at Hanford and INEEL. This is an issue of requiring effective site management performance at these sites, which should not be an issue in selecting a site based upon the EIS process. Governor Locke supports Hanford for this mission. 9

This Draft EIS must be revised to give balanced consideration to the following issues:

- Potential cost savings resulting from the use of the FMEF at Hanford must be considered. The EIS is not credible without consideration of this issue. 11

- The avoidance of new program assignments to Hanford in order to avoid the diversion of effort from the cleanup program is a management issue – not an environmental assessment issue. 9

- There is no essential difference between the environmental impacts between the sites; therefore, the least cost for the program is an environmental issue. 13

- The data in the draft EIS clearly shows that actual transportation impacts between sites are not significant. 12

- The document as written clearly does not provide a basis for a selection decision between sites. Only by omitting comparative costs and making assumptions favoring a specific site can the preferred site conclusion contained in the draft assessment be supported. 11

- The draft EIS is not a balanced and objective assessment. It must be extensively revised to reflect an objective evaluation for it to be acceptable and without challenge. 2

- An objective evaluation of comparative plutonium disposal program costs including facility comparisons must be made. Current DOE studies and documentation regarding these costs must be made available for public review. 8

WAD18

TRI-CITY INDUSTRIAL DEVELOPMENT COUNCIL
PAGE 6 OF 6

The Draft EIS as written does not comply with the legal requirements of the National Environmental Policy Act for a balanced evaluation of all feasible alternatives. This document could be the subject of litigation if it is not withdrawn and ~~reviewed~~ revised to comply in all respects with the National Environmental Policy Act. 2

WAD18

TRI-CITY INDUSTRIAL DEVELOPMENT COUNCIL
SAM VOLPENTEST
PAGE 1 OF 3

TRIDEC TRI-CITY INDUSTRIAL DEVELOPMENT COUNCIL

901 N. Colorado, Kennewick, WA 99336-7685 USA 1-800-TRI-CITY 509-735-1000 509-735-6609 fax tridec@owt.com www.owt.com/tridec/

September 15, 1998

Mr. Howard Canter, Acting Director
Office of Fissle Materials Disposition
U.S. Department of Energy
PO Box 23786
Washington, D.C. 20026-3786

Surplus Plutonium Disposition
Draft Environmental Impact Statement

During the August 4, 1998 public meeting in Richland, Washington we submitted a statement regarding the subject EIS. In this statement we identified a number of issues with the EIS related to siting this program at Hanford which resulted from erroneous costing data faulty logic and unsupported assumptions contained in the draft EIS. Specifically we were astonished at the cost estimates contained in the EIS, which did not identify the savings which would result from use of the FMEF at Hanford for the plutonium disposition program. 1

The purpose of the Environmental Impact Statement process is to provide an objective, balanced, and defensible evaluation of all viable alternatives to the proposed governmental action. Environmental Impact Statements that are severely flawed and which do not meet the criteria for the evaluation of feasible alternatives, are subject to legal challenges and significant programmatic delays. This EIS and its supporting documentation such as DOE/MO-0009 Rev.0 "Cost Analysis in Support of Site Selection for Surplus Weapons Usable Plutonium Disposition" does not meet any criteria for an objective evaluation of reasonable program alternatives. 2

This document has a publication date of July 22, 1998, yet it was not made available for public review and comment prior to the August 4 hearing in Richland. It has not been widely made available to the public since that date. Perhaps due to the erroneous and faulty analysis contained in this document your office has been reluctant to have it reviewed and commented on by the public. 3

We have worked with local firms and individuals who are knowledgeable regarding the FMEF in the review of the cost data contained in your documentation. These reviews indicated that the cost estimates for surplus plutonium disposition alternatives are biased against the Fuels and Materials Examination Facility at Hanford. Because of this [illegible] estimates are of limited value for comparing costs of different alternatives. 4

MD326

MD326–1 **Cost Report**

Neither the SPD Draft EIS nor the SPD Final EIS contain cost estimates. It is assumed the cost estimates referred to were observed in the associated cost analysis report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998). This comment has been forwarded to the cost analysis team for consideration. The *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. The information presented in the cost report was based on the best information available from the candidate sites at the time it was published. DOE continues to gather information on the costs associated with constructing the proposed surplus plutonium disposition facilities and has prepared the life-cycle costs document to address changes in the expected costs as well as respond to public comment.

Responses to the issues identified in the August 4, 1998, statement can be found under the comment identification code WAD18.

MD326–2 **General SPD EIS and NEPA Process**

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for surplus plutonium disposition facilities. Use of FMEF in the surplus plutonium disposition program is considered in this SPD EIS under Alternatives 2, 4, 6, 8, 10, and 11. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

TRI-CITY INDUSTRIAL DEVELOPMENT COUNCIL
SAM VOLENTEST
PAGE 2 OF 3

Our analysis of your documentation indicates that installing a MOX line in the FMEF would save just $40 million compared to building a new, stand-alone facility. It is not reasonable that using an existing facility would save less than 10% of total Design and Construction Costs (estimated at $530 million for a new, stand-alone facility).

Examination of the engineering documents from which these figures were derived indicates that Total Estimated Cost (TEC) for Design and Construction of MOX at Hanford is $410 M for a new facility and $340 M for the FMEF. This is less than a 20% reduction for avoiding the construction of a 140,000 S.F. earthquake and tornado resistant, Category 1 facility.

Detailed analysis of the estimates reveals that they are based upon erroneous assumptions. For example, both estimates assume a completely new HVAC system is required for the FMEF at a cost of $36 M. This may be reasonable for a new facility but is not applicable to FMEF, which already has a complete HVAC system for a MOX line.

The cost of upgrading the FMEF is estimated to be 65% of the cost of a new facility. This is not reasonable with the FMEF costs significantly overstated. Previous detailed cost estimates prepared at Hanford indicate that $24 M is required to modify the FMEF to accommodate MOX program including $9 M in security upgrades.

The cost estimate for the FMEF alternative also includes $38 M for support equipment and facilities that are not needed. All of the required capabilities already exist for the FMEF alternative. Subtracting these costs from the FMEF estimate and substituting in the Hanford estimate for building modifications reduces the TEC for the FMEF alternative to about $250 M or about 60% of the cost of a new facility. 4

However, an independent estimate done at Hanford shows that the MOX process can be installed in the FMEF for about $160 M. This represents savings of $250 M compared to the estimates for a new, stand-alone facility. This estimate was prepared by staff knowledgeable of the facility and was based on detailed equipment lists and glove box layouts. It was prepared and reviewed by experienced estimators.

It is clear that using the FMEF would be substantially cheaper than building a new facility. There are also technical and programmatic risks involved with starting a new major systems acquisition (MSA) in the current federal budget situation. The contingency will be higher for a new facility than for an existing facility. The configuration of the FMEF is well defined and the available space is more than adequate.

The FMEF alternative can be implemented on a shorter schedule than the construction of a new facility. The design and construction of a new facility increases the risk of schedule delays and budget cuts that slow progress and add to the overall life-cycle costs. The FMEF alternative has the unrecognized benefit of being able to proceed immediately and the possibility of accelerating the schedule rather than delaying it.

Finally, in order to understand the best possible benefit to DOE and the taxpayers, it would be appropriate to allow the commercial fuel fabricators to provide their input regarding the

2

MD326

MD326–3 **Cost Report**

The cost analysis report and the life-cycle cost document are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. The cost analysis report was posted on the Internet for public review shortly after its release.

MD326–4 **Cost Report**

Because this comment relates directly to the cost analysis report, it has been forwarded to the cost analysis team.

preferred option for a MOX fuel fabrication facility owned by DOE, but operated by the private sector. Economic factors clearly favor utilizing and existing facility and the private sector is best equipped to advise DOE on the relative cost advantages of using the FMEF. 4

Based on these identified deficiencies and erroneous conclusions in the EIS and its supporting documentation we recommend that the documents be withdrawn and rewritten to provide a factual, balanced, and objective evaluation of the program alternatives including utilization of the FMEF for both the pit disassembly and conversion process and the MOX fuel fabrication. 2

These actions on your part will avoid the potential programmatic delays resulting from potential stakeholder legal action and congressional inquiries.

Thank you for your consideration of these comments.

Very truly yours,

Sam Volpentest

Sam Volpentest
Executive Vice President

C: Secretary Richardson
Senator Slade Gorton
Senator Patty Murray
Congressman Doc Hastings
Congressman Norm Dicks

3

MD326

VENETZ, TED
PAGE 1 OF 1

Public Comment to DOE's Materials Disposition EIS
Richland Public Meeting, August 4, 1998

I disagree with the statement that siting the MOX fuel fabrication facility at Hanford would interfere with the cleanup mission. I believe it would in fact complement it. For example:

A continuing federal interest in the site, such as future site use for material Disposition Activities, is a definitive way to ensure a continued commitment to site cleanup. 1

A new Materials Disposition mission would share some of the overhead and infrastructure costs for the site, freeing more of the site cleanup budget and resources for actual cleanup work.

Use of the Hanford site FMEF facility would save hundred of millions of taxpayer dollars over the alternatives that involve construction of new facilities. As Congress appears unwilling to increase the overall DOE budget, this money would likely come out of existing budget at the expense of cleanup programs, including those at Hanford. 2

Ted Venetz
1101 So Irby
Kennewick, WA

WAD23

WAD23–1 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

WAD23–2 **Cost**

Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably.

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

WA MFG. SERVICES, WSU-TRICITIES
WILLIAM T. SELLERS
PAGE 1 OF 1

I oppose the MOX facility at the Hanford Site for the folowing reasons:

1. Politically impossible to get approval in PacNW, the delays & ill-will would threaten the DOE itself.

2.Other than WPPSS who would burn the fuel? Transport out of here would be impossible 1

3. Other states (TX or SC) actually want the project, and have powerplants close by to burn it.

4. This dilutes the basic mission at the Hanford Site, which should be to "clean it up and shut it down", period.

WD005

WD005–1 **Alternatives**

DOE acknowledges the commentor's opposition to siting the MOX facility at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

Washington, Office of the Governor
Honorable Gary Locke
Page 1 of 1

GARY LOCKE
Governor

STATE OF WASHINGTON
OFFICE OF THE GOVERNOR
P.O. Box 40002 • Olympia, Washington 98504-0002 • (360) 753-6780 • TTY/TDD (360) 753-6466

April 30, 1998

The Honorable Federico Peña, Secretary
U.S. Department of Energy
1000 Independence Avenue SW
Washington, D.C. 20585

Dear Secretary Peña:

This letter is a follow-up to our discussions earlier this year regarding Hanford.

Department of Energy (Department) compliance with the cleanup program commitments contained in the Tri-Party Agreement (TPA) is of overriding concern to the citizens of Washington state. As I have previously stated, the Department must demonstrate a commitment to the achievement of the TPA milestones and cleanup goals before we can support new programs at Hanford. In particular, effective progress must be made in the removal of spent fuel from the K-Reactor basins and treatment of the tank wastes. Washington State needs the Department to advocate strongly for budgets which will move us ahead in these areas and we need to see substantive progress in these areas this year. 1

I recognize Hanford is potentially a valuable asset for the Department of Energy. The Hanford site can continue to make a contribution, providing that new programs not interfere with the Department's cleanup responsibilities. Just as Hanford fulfilled a critical role for the nation during World War II and the Cold War, we know it could contribute toward international disarmament regarding plutonium disposition. I have also indicated my support for the medical isotope mission for the Fast Flux Test Facility, recognizing tritium production would serve as an interim bridge to meet this goal. 2

In looking ahead at these issues, it would be very helpful to see how the Department proposes to allocate new missions across its facilities nationwide. Washington has served as one of the nation's principal facilities for production of nuclear weapons, an activity that has left us with two-thirds of the Department's high level radioactive waste and seventy-five percent of its spent nuclear fuel. Washington is willing to do its share, but there must be a fully shared responsibility in this regard with other facilities across the country. 3

I look forward to working with the Department of Energy on these issues in the future.

Sincerely,

Gary Locke
Governor

WAD19

WAD19–1 **DOE Policy**

DOE acknowledges the Governor's concern that Tri-Party Agreement commitments be met before new programs at Hanford be initiated. As stated in Chapter 5, it is DOE's policy to conduct its operations in an environmentally safe manner in compliance with all applicable statutes, regulations, and standards, which include the Tri-Party Agreement.

WAD19–2 **DOE Policy**

DOE acknowledges the Governor's support for siting the proposed surplus plutonium disposition facilities at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

WAD19–3 **DOE Policy**

Section 4.32.1 takes into consideration existing missions (e.g., cleanup at Hanford) at candidate sites, as well as analyzes the potential cumulative impacts of surplus plutonium disposition activities and other programs' current (as well as past and reasonably foreseeable future) activities at the sites. DOE's various program offices individually develop strategic planning documents for their programs. For example, the Office of Environmental Management, whose mission is to manage the HLW and spent nuclear fuel, recently issued *Accelerating Cleanup: Paths to Closure* (DOE/EM-0362, June 1998).

West Richland
Honorable Ken Dobbin

Pu Disposition EIS Public Hearing in Richland WA **8-4-98**

I am Ken Dobbin, Councilman from the City of West Richland.

I represent a public fed up with government tax and squander policies.

DOE, what part of NO don't you understand?

The public says NO to ignoring Hanford facilities just to rebuild them in another state.

The Fuels and Materials Examination Facility (FMEF) here at Hanford is well suited to the MOX mission and represents at least $500M of the taxpayers'resources that they want you to utilize.

Those of us who have spent the last 4 years working on restarting the Fast Flux Test Facility (FFTF) in the battle on cancer continue to hear that the DOE funding is a zero-sum game. 1

If so, where will the funds come from you plan to squander on the MOX mission?

Will you eventually tell us cancer fighters that there is no money to restart the FFTF?

The resources saved by using Hanford facilities for plutonium disposition could operate the FFTF in the fight on cancer for a decade. That takes us past the 8-year breakeven point on medical isotope revenues for the FFTF.

DOE, are you telling us cancer fighters that you have additional money to restart the FFTF, or are you telling us that you will let those with cancer continue to suffer and die?

I represent a public that wants answers!

WAD24

WAD24–1 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility in FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source. In December 1998, the Secretary of Energy decided that FFTF would not play a role in producing tritium.

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

WEST RICHLAND
HONORABLE JERRY A. PELTIER
PAGE 1 OF 1

CITY OF WEST RICHLAND
3801 Van Giesen St. ❖ West Richland, WA 99353 ❖ Tele: (509) 967-3431 ❖ FAX (509) 967-2251

TESTIMONY OF JERRY A. PELTIER, MAYOR
CITY OF WEST RICHLAND, WASHINGTON

Regarding the Draft Environmental Impact Statement for Plutonium Disposition

One year ago the Department of Energy held scoping meetings on the Surplus Plutonium Disposition Environmental Impact Statement. At those meetings in Richland, a clear message was delivered to the Department. "We want an objective, unbiased assessment of all of the Plutonium disposition challenges and opportunities. Pre-determined outcomes must not drive the EIS and Record of Decision process." The Draft EIS in front of us today is an excellent example of a technical justification of a pre-determined outcome. I would think, with the Department of Energy's current standings with the Congress of the United States, that every effort possible would have been made to write a balance and unbiased document. This draft EIS should be withdrawn and revised to give a fair evaluation of each of the alternatives.

- The EIS does NOT address comparable costs, especially the Fuels and Materials Examination Facility (FMEF) at Hanford.
- The EIS is clearly not a balanced and objective assessment.
- An objective evaluation of comparable disposal programs must be made. 1
- Misrepresents Hanford by a claim that an additional facility would be required, when in fact both the Pit Dissembly and MOX fuel could be performed in the same facility.
- Ignores the potential cost savings of co-locating the Pit Dissembly and Mox in the same facility.
- Does not address, with the current flat and/or declining budgets, how the additional costs of Plutonium disposition will be programed.

Let me conclude by saying once again I am very disappointed in the Department of Energy's process for developing this EIS. We pre-determined a year ago, based on the political climate, what this EIS was going to say. Believe me the Department has not let us down, this draft EIS is political statement that ignores the tax payers best interest. Hanford is a proud community and we have paid an enormous price in the name of National Defense. We feel that we deserve a fair and unbiased evaluation in regard to Platinum Disposition.

WAD17

WAD17–1 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at Hanford. DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for surplus plutonium disposition facilities. Section 2.10.2 describes Alternative 6B which involves collocating the pit conversion and MOX facilities in FMEF and Section 4.11 presents the potential environmental impacts.

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for response. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

SEPT 16, 1998

TO: USDOE,Office of Fissile Materials Disposition,
MD-4 Forrestal Building
1000 Independence Ave., Washington , D.C. 20585

FROM: Tim Young and MB Condon
380 Ilsa Way,Goldendale, WA 98620

RE: Surplus Plutonium Draft EIS

Enclosed is a written text of our comments regarding the SPDEIS. These comments were left by voice on the answering machine at 1-800-820-5156 on Sept. 16,1998 after we were unable to transmit them by fax to your office. Clearer instructions for sending a fax in your message would be helpful.

Tim Young

MD246

FOR THE PUBLIC RECORD

SEPT 16, 1998

TO: USDOE,Office of Fissile Materials Disposition,
MD-4 Forrestal Building
1000 Independence Ave., Washington , D.C. 20585

FROM: Tim Young and MB Condon
380 Ilsa Way,Goldendale, WA 98620

RE: Surplus Plutonium Draft EIS

We want the following questions, concerns, and assumptions addressed in the SPD EIS:

1. What classified toxic elements are contained in nuclear warhead pits and how much toxic pollution is going to be created by the separation of those elements from plutonium? Where are the toxic waste products going to be stored and how are they going to be handled? 1

2. Which specific reactors in the US are going to be licensed to "burn" plutonium? How are reactors that were never designed for this fuel going to be tested and certified before allowing plutonium radiation to be generated by them? How are the safety records of commercial reactor operators going to be factored into the decisions to allow them to use plutonium as a reactor fuel? Why should reactors that are scheduled for de commissioning be allowed to continue operating beyond their scheduled life span and then be allowed to utilize a fuel they were never designed to burn? 2

3.Specifically, how much radioactive waste will be created by each step of plutonium reprocessing, from the removal of plutonium oxide from bomb cores, the creation of MOX fuels, the transportation of all radioactive materials including the waste products, to the generation of electricity and possibly the production of tritium? How much more radioactive waste will be generated by each reactor that would be allowed to operate beyond its de-commissioning date ,compared to the amount of radioactive waste created if the reactors were retired on schedule? 3

4. How are DOE and the commercial reactor operators going to protect the public and the environment from the radioactive hazards posed by the generation of more nuclear waste from the burning of MOX fuels, when both the DOE and commercial operators have no idea of how to protect the public and the environment from the radiation hazards presently posed by the burning of uranium in reactors? 4

5. What specific transportation means and routes will be used to transport the weapons grade plutonium, MOX fuels, and the resulting nuclear and toxic waste? How will the public be notified, so their elected officials can participate in the creation of disaster plans in the case of a 5

MD246

MD246–1 **Pit Disassembly and Conversion**

A pit is made of plutonium, which consists mainly of the isotope plutonium 239. Pit plutonium can contain trace amounts of a variety of hazardous impurities such as beryllium and lead. These contaminants are expected to remain entrained in the plutonium dioxide material. The very low levels of contaminants do not adversely affect the immobilization and MOX approaches, and inclusion of the polishing step in the MOX facility would remove much of the contaminants. Some pits may also be contaminated with tritium, a radioisotope of hydrogen which can be removed by heating the pit material in a vacuum furnace to drive off the tritium gas. Another element which may be present in pit plutonium at low levels, but above trace amounts, is gallium, which is added as an alloying agent. Because high levels of gallium may adversely affect MOX fuel performance, it is largely removed during the pit conversion process, as discussed in Section 2.4.3.2. The pit conversion process would generate some LLW and TRU waste and a very small amount of mixed LLW and hazardous waste. These wastes include spent filters, used containers and equipment, paper and cloth wipes, protective clothing, shielding, solvents, and cleaning solutions. In general, these wastes contribute to less than 4 percent of the existing wastes at all the candidate sites and would be handled as part of the site waste management practice. A description of waste generation and management is provided in Appendix H.

MD246–2 **MOX Approach**

Although no U.S. commercial reactors are licensed to use plutonium-based fuel, several are designed to use MOX fuel, and others can easily accommodate a partial MOX core. Therefore, DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. As a result of this procurement, DOE identified Catawba, McGuire, and North Anna as the reactors proposed to irradiate MOX fuel as part of the proposed action in this SPD EIS. In accordance with a stipulation of its RFP for MOX Fuel Fabrication and Reactor Irradiation Services, these are new reactors, that is, reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program. The selected team, DCS, would have to apply for a reactor operating license amendment for each individual reactor before it can use MOX fuel. For this amendment, the licensee would have to demonstrate that all safety, testing, and environmental impacts have been addressed as well as complete the public hearing process. In addition, NRC would evaluate license applications and monitor the operations of both the MOX facility and the commercial reactors selected to use MOX fuel to ensure adequate margins of safety. Section 4.28 was revised to provide reactor-specific analyses and discuss the potential environmental impacts of using a partial MOX core during routine operations and reactor accidents.

MD246–3 **Waste Management**

DOE acknowledges the commentors' concerns regarding waste generation and management. Waste streams that would be generated by the pit conversion, immobilization, and MOX facilities are detailed in the Waste Management sections in Chapter 4 of Volume I and Appendix H. As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

The transportation requirements for the surplus plutonium disposition program are also evaluated in this SPD EIS. The shipment of waste will be done in accordance with the decisions reached on the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997).

The production of tritium in a commercial light water reactor is being evaluated in a separate DOE EIS, *Final EIS for the Production of Tritium in a Commercial Light Water Reactor* (DOE/EIS-0288, March 1999).

In choosing reactors to use the MOX fuel fabricated under the surplus plutonium disposition program, DOE looked at the criteria of reactor age. DOE chose only reactors whose planned operating life extended through the full life cycle of the surplus plutonium disposition program.

MD246–4 **Human Health Risk**

DOE and NRC are committed to protecting the health and safety of the public. This includes designing, constructing, and operating DOE- and NRC-regulated facilities (e.g., domestic, commercial reactors) in such a way as to continually provide a level of safety and reliability that meets or exceeds established standards. DOE and commercial reactors also have plans and programs for the safe management and ultimate disposal of their nuclear waste. Section 4.28 addresses the issue of waste generation by those domestic, commercial reactors designated to irradiate MOX fuel.

The remainder of this comment is addressed in the spent fuel portion of response MD246–3.

MD246–5 **Transportation**

DOE anticipates that transportation of plutonium pits, nonpit plutonium, MOX fuel, and HEU (i.e., special nuclear materials) required to disposition surplus plutonium would be done through the DOE Transportation Safeguards Division using SST/SGTs as described in Appendix L.3.2. The shipment of nuclear material (e.g., depleted uranium) using commercial carriers would be the subject of detailed transportation plans in which routes and specific processing locations would be discussed. These plans are coordinated with State, tribal, and local officials. For emergency response planning, all shipments are coordinated with appropriate law enforcement and public safety agencies. If requested, DOE will assist these officials with response plans, and, if necessary, with resources in accordance with DOE Order 5530.3. DOE has developed and implemented a Radiological Assistance Program to provide assistance in all types of radiological accidents. Through this coordination and liaison program, DOE offers in-depth briefing at the State level.

The transportation of depleted uranium oxide and waste (i.e., non-special nuclear materials) would be done using commercial carriers. Nuclear material shipments must comply with both NRC and DOT regulatory requirements. Appendix L.3.3 provides details on the transportation of this type of materials and the transportation route selection process. DOT routing regulations require that shipments of radioactive material be transported over a preferred highway network including interstate highways, with preference toward bypasses around cities, and State-designated preferred routes.

mishap? What specific plans are in place for nuclear mishaps along the transportation routes and are they adequate to protect the public, crops, livestock, and the environment from exposure in the case of an accident or intentional destructive act? 5

We are totally opposed to the reprocessing of weapons-grade plutonium into MOX fuels to be burned in commercial nuclear reactors. Furthermore there should be no taxpayer subsidies to commercial operators to allow them to use MOX fuels in reactors that were never designed to do so and to allow the life of reactors to be extended beyond their scheduled de-commissioning date.

The DOE and the commercial nuclear industry should not be allowed to initiate any programs that will create more radioactive and toxic waste when the technology doesn't exist to deactivate and neutralize the waste created over the last fifty years by industry and the government. 6

We support the isolation and vitrification of weapons-grade plutonium. Although this is an inadequate solution to the radioactive waste problem, it at least, offers some assurance that these materials won't find their way into nuclear weapons in the future.

Finally, we have no confidence in the DOE's ability to safely and securely transport weapons-grade plutonium and MOX fuels to reactor sites. The public and their elected representatives are totally uninformed and unprepared for any nuclear mishaps that could result and we don't think that the DOE or the nuclear industry has the will or the resources to adequately prepare the public for the possible dangers that these materials represent to their communities. 7

We are also unwilling to give up any of our rights so that these materials can be moved "securely" through our communities.

Tim Young and MB Condon

Tim Young
MB Condon

MD246

The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in this SPD EIS. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http:\\www.doe-md.com.

MD246–6 **Alternatives**

DOE acknowledges the commentors' opposition to the MOX approach and support for the immobilization approach to surplus plutonium disposition.

U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons.

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the cost and schedule estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

MD246–7 **DOE Policy**

It is DOE's policy that plutonium shipments must comply with applicable DOT and NRC regulatory requirements. The highway routing of nuclear material is systematically determined according to DOT regulations 49 CFR 171 through 179 and 49 CFR 397 for commercial shipments. Transportation of special nuclear materials, including fresh MOX fuel, would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material. As indicated in

Section 2.18, no traffic fatalities from nonradiological accidents or LCFs from radiological exposures or vehicle emissions would be expected for any of the surplus plutonium disposition alternatives proposed at the candidate sites. A description of the transportation activities is given in Section 2.4.4. Transportation risks and steps to mitigate the risks are analyzed in Chapter 4 of Volume I and Appendix L.

ZEPEDA, BARBARA
PAGE 1 OF 2

FOR: FORMAL COMMENT
DUE 9-16-98
ON SPD-EIS
PLEASE ADD
THIS 2 PAGE
LETTER

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

98-AMF-009

JUL 16 1998

JUL 27 RECD

? WHY DOESN'T IAEA MONITOR CLEANUP? 1

PHONE 206-324-8571

FROM
Ms. Barbara Zepeda
~~1937 25th~~ MOVED TO 308 E REPUBLICAN #708
Seattle, Washington ~~98112~~ 98102

Dear Ms. Zepeda:

INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA) ACTIVITIES AT HANFORD

Thank you for participating in the March 10, 1998, public meeting in Seattle, Washington, relating to Hanford's Fiscal Year 2000 budget. I am responding to your request for IAEA reports concerning Hanford plutonium-bearing inventories, which have been placed under the IAEA Safeguards regime through international agreement.

First, let me explain the IAEA's role at Hanford, since I believe it to be much more limited than you perceive. The IAEA routinely visits Hanford about once a month for about two days. They visit only the Plutonium Finishing Plant (PFP) complex and specifically, visit only one of the PFP buildings. Their only role at Hanford is to ensure that the quantity of plutonium-bearing materials, approximately one metric ton, placed under their safeguard regime by international agreement at the PFP is stored and monitored in a configuration which assures no possible diversion for weapons or other use. They employ a series of cameras, tamper-indicating seals, and other electronic monitoring systems to ensure that none of the plutonium has been tampered with since their last visit. As part of the IAEA and United States Agreement (INFCIRC 288), the IAEA has the option to do random selection and sampling of this inventory to further ensure that the containers still have the reported plutonium quantities.

? The IAEA only verifies that the Hanford plutonium inventory under IAEA control is safe from diversion and is in the exact quantities as declared by the U. S. Department of Energy (DOE). The IAEA does not look at site safety. They do not oversee any waste operations or cleanup operations at Hanford or at any other DOE site. Their charter does not include "safety oversight," but is restricted by charter to international safeguards and nonproliferation.

To assist you further, I recommend a review of the IAEA's Information Circular (INFCIRC/288, dated December 1981), entitled "The Text of the Agreement of November 18, 1977, Between the United States of America and the Agency for the Application of Safeguards in the United States of America." ? This document will assist you in understanding the specific roles and responsibilities of both the IAEA and the United States. If you have internet access, you may visit the IAEA webpage at www.iaea.or.at/worldatom for information in acquiring unclassified IAEA reports.

INFCRC/288 SHOULD BE AVAILABLE AT ALL PUBLIC MEETINGS ON HANFORD. 2

MD002

MD002–1 **General SPD EIS and NEPA Process**

IAEA serves as the world's intergovernmental forum for scientific and technical cooperation in the nuclear field, as well as the international inspector for the application of nuclear safeguards and the verification measures covering civilian nuclear programs. This includes verifying compliance with international nonproliferation policies. IAEA would monitor the surplus plutonium disposition program activities except those involving classified activities. Domestic, commercial reactors that would use MOX fuel are already subject to IAEA inspection.

IAEA also has a Radioactive Waste Safety Standards Programme and an International Waste Management Advisory Committee. DOE's Office of Environmental Management represents the United States on this committee, which oversees and directs the activities of RADWASS. RADWASS has produced standards for construction, operation, and closure of disposal facilities; standards for decommissioning nuclear power plants and nuclear research facilities; and standards for deriving cleanup levels for contaminated land areas. IAEA also provides an international peer review service for radioactive waste management, the Waste Management Assessment and Technical Review Program. Information on these programs can be found on the IAEA Web site for radioactive waste management at http://www.iaea.or.at/worldatom/inforesource/annual/anr9404.html.

MD002–2 **General SPD EIS and NEPA Process**

It is not possible to have every potential source of information about plutonium disposition in each DOE reading room. Therefore, DOE strives to have, as a minimum, a copy of each of its environmental documents (e.g., this SPD EIS). For cases in which a document is not available, the DOE reading room staff will attempt to obtain a copy or provide information on how a copy can be obtained.

ZEPEDA, BARBARA
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Ms. Barbara Zepeda -2-
98-AMF-009

The official DOE material balance reports to the IAEA are detailed listings of Hanford plutonium under the IAEA safeguard regime by discrete location. Official IAEA inspection reports to both the State Department and DOE are similarly detailed. I regret that, due to the specificity of the information, both ? the IAEA and DOE reports are not available for disclosure.

I hope that this information answers your questions regarding the IAEA role at Hanford. If you have any questions regarding this letter, please contact Mr. Angel Joy, of my staff, at (509) 373-7834.

Sincerely,

Peter M. Knollmeyer, Assistant Manager
for Facility Transition

AMF:PMK

MD002

NATURAL RESOURCES DEFENSE COUNCIL

15 September, 1998

Mr. Howard Canter, Acting Director
Office of Fissile Material Disposition
U.S. Department of Energy
P.O. Box 23786
Washington, D.C. 20026-3786

Subject: **NRDC Comments on the Surplus Plutonium Disposition Draft Environmental Impact Statement**

Dear Mr. Canter:

We are writing to provide you with the Natural Resources Defense Council's (NRDC's) comments on the Department of Energy's (DOE's) *Surplus Plutonium Disposition Draft Environmental Impact Statement* (SPD DEIS) (DOE/EIS-0283-D), July 1998.

The SPD DEIS is deficient in the following respects:

I. The SPD DEIS fails to identify the current (and proposed future) locations, chemical and physical forms, isotopic mix, purity and related information concerning the various categories of plutonium that make up the 52.5 tonnes (t) of U.S. excess plutonium (Pu). Consequently, we are unable to judge whether the proposed disposition options are appropriate for each category of plutonium. 1

II. The United States and Russia completed a "Joint United States/Russian Plutonium Disposition Study" in September 1996. In this study Russia is on record as agreeing that, "The United States and Russia need not use the same [plutonium] disposition technology."[1] Thus, there is no compelling argument for allocating most of the U.S. excess plutonium to the mixed-oxide fuel (MOX) disposition alternative. The U.S. and Russian disposition options are not so inextricably linked to require the maximum possible amount of U.S. excess plutonium to be converted into MOX. NRDC believes that the United States should place a much higher priority on implementing the vitrification option in both countries. The SPD DEIS fails to discuss the process and criteria for deciding how much of the 33 t of Pu that is technically suitable for MOX will actually be fabricated into MOX, and it fails to discuss the timing of any decisions to vitrify any of this material. There is no discussion of the implications of this determination on the sizing of the 2

1 "Joint U.S./Russian Plutonium Disposition Study," September 1996, Executive Summary, p. ExSum-2.

1200 New York Ave., N.W.
Suite 400
Washington, DC 20005
202 289-6868
Fax 202 289-1060

Suite 1625
San Francisco, CA 94105
415 777-0220
Fax 415 495-5996

Suite 250
Los Angeles, CA 90048
213 934-6900
Fax 213 934-1210

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FD314–1 **DOE Policy**

The locations of the surplus plutonium were provided in the *Storage and Disposition PEIS*, and the information in that document has been summarized in Section 1.1 and incorporated by reference into this SPD EIS. The current locations, with the exception of the pits that were moved from RFETS to Pantex, are the same as those given in the *Storage and Disposition PEIS*. The future locations of the surplus plutonium are specified in the *Storage and Disposition PEIS* ROD and will be documented in the ROD for this EIS. The detailed chemical and physical forms, isotopic mix, purity, and related information on surplus plutonium exist in classified reports that were used as source material in preparing the Storage and Disposition PEIS and this SPD EIS. An unclassified version of this information was prepared and made available to the public in a report titled *Feed Materials Planning Basis for Surplus Weapons-Usable Plutonium Disposition* (MD-0013, April 1997). The bounding isotopic composition of surplus plutonium is provided in Appendix J of this EIS.

In order to support the early closure of RFETS and the early deactivation of plutonium storage facilities at Hanford, DOE modified some of the decisions made in its *Storage and Disposition PEIS* ROD. In the amended ROD for the *Storage and Disposition PEIS*, DOE announced the following actions: (1) the accelerated shipment of all nonpit, surplus weapons–usable plutonium (about 7 t [7.7 tons]) from RFETS to SRS beginning in about 2000 if SRS is selected as the site for the immobilization facility, and (2) the relocation of all Hanford surplus weapons–usable plutonium (about 4.6 t [5.1 tons]) to SRS between about 2002 and 2005.

FD314–2 **Nonproliferation**

Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

DOE reviewed the chemical and isotopic composition of the surplus plutonium and determined in the *Storage and Disposition PEIS* ROD that about 8 t (9 tons) of surplus plutonium were not suitable for use in making MOX fuel. Furthermore, DOE has identified an additional 9 t (10 tons) for a total of 17 t (19 tons) that have such a variety of chemical and isotopic compositions that it is more reasonable to immobilize these materials and avert the processing complexity that would be added if these materials were made into MOX fuel. The criteria used in this identification included the level of impurities, processing requirements, and the ability to meet the MOX fuel specifications. If at any time it were determined that any of the 33 t (36 tons) currently proposed for MOX fuel fabrication was unsuitable, that portion would be sent to the immobilization facility. The addition of this material would not require the immobilization facility to operate longer because it is being designed to handle a throughput of up to 50 t (55 tons) over a 10-year period. Likewise, the MOX facility is being designed to handle up to 33 t (36 tons) of surplus plutonium, but would have the flexibility to operate at a lower throughput. Under either the immobilization-only approach or the hybrid approach, all 50 t (55 tons) of surplus plutonium would be processed out of the proposed plutonium disposition facilities over a 10– to 15–year period beginning in about 2006.

proposed MOX fabrication plant. In addition, the DEIS fails to provide the information needed respond to the following important questions: 2

1. Is the MOX option more or less expensive than the vitrification option? The SPD Final EIS should provide a comparative cost analysis of the vitrification and MOX methods that would clarify the relative costs of each to better inform future decisions on how much plutonium should be disposed of via each of these methods. 3

2. Does DOE agree that disposing of a given quantity of plutonium using the MOX disposition option is more likely to take longer than disposing of the same quantity of plutonium using the vitrification option? The SPD Final EIS should provide a comparison of the time required to dispose of a given quantity of plutonium by each option that would clarify the relative processing times of each to better inform future decisions on how much plutonium should be disposed of via each of these methods. 4

3. Does DOE agree that the MOX option is inherently more dangerous than the vitrification option? The SPD Final EIS should provide a comparison of nuclear material security and proliferation risks associated with each option that would clarify the relative magnitude of the dangers of each to better inform decisions on how much plutonium should be disposed of via each of these methods. 5

III. The current DOE policy makes construction of the U.S. MOX fabrication plant contingent on "significant progress with Russia on plans for plutonium disposition" by the end-FY 2000 [September 30, 2000].[2] There is no discussion in the SPD DEIS of this policy or its implications.

1. Exactly what is meant by "significant progress?"

2. What did the DOE have in mind when it adopted this policy? 6

3. Where in DOE's submissions to Congress is this policy set forth?

4. Will DOE move ahead with vitrification of the 17 t of Pu that is unsuitable for MOX even if there is no progress on the Russian side?

IV. In 1996, the U.S. and Russia agreed that "...disposition of U.S. and Russian excess weapons plutonium should proceed in parallel, with the goal of reductions to equal levels of military plutonium stockpiles."[3] However, the DEIS lacks the basic information needed to allow 7

2 Statement of Howard Cantor, Acting Director, Office of Fissile Material Disposition, at the Council on Foreign Relations "The Management and Disposition of Excess Nuclear Weapons Material," March 9, 1998.

3 "Joint U.S./Russian Plutonium Disposition Study," September 1996, Executive Summary, p. ExSum-2.

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FD314–3 **Cost**

As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons–Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach, which includes both immobilization and MOX fuel, would be more expensive than the immobilization–only approach. However, as discussed in response FD314–2, pursuing the hybrid approach provides the United States important insurance against potential disadvantages of implementing either approach by itself. For an update of the cost of the preferred alternative, see the new report, *Plutonium Disposition Life–Cycle Costs and Cost–Related Comment Resolution Document* (DOE/MD-0013, October 1999). These reports are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS and Washington, D.C. DOE will continue to refine the cost estimates for the proposed surplus plutonium disposition facilities as decisions are made in the ROD and design of the facilities progresses.

FD314–4 **Alternatives**

Operation of the proposed surplus plutonium disposition facilities is expected to take approximately the same amount of time for either approach. The difference in timing for the hybrid approach is associated with the amount of time that MOX fuel would be irradiated in domestic, commercial reactors. However, none of the proposed reactors are expected to operate longer under the hybrid approach than they would if they continued to use LEU fuel.

FD314–5 **Nonproliferation**

DOE does not agree that the MOX approach is inherently more dangerous than the immobilization approach. DOE and NAS have conducted studies to compare risks, including the nuclear material security and proliferation risks of alternatives analyzed in this SPD EIS. These studies include the *Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Materials Storage and Excess Plutonium Disposition Alternatives* (DOE/NN-0007, January 1997), *Proliferation Vulnerability Red Team Report* (SAND 97-8203, October 1996), *Management and Disposition of Excess Weapons Plutonium* (March, 1994), and *Management and Disposition of*

Excess Weapons Plutonium, Reactor–Related Options (1995). As discussed in Section 4.28.2.5, studies by NAS have led it to the following conclusion: "no important overall adverse impact of MOX use on the accident probabilities of the LWRs involved will occur; if there are adequate reactivity and thermal margins in the fuel, as licensing review should ensure, the main remaining determinants of accident probabilities will involve factors not related to fuel composition and hence unaffected by the use of MOX rather than LEU fuel."

FD314–6 **Nonproliferation**

The term "significant progress" is not intended to be a singular formulaic benchmark. Rather, it is intended to be used in judging progress in the Russian program by a combination of political actions and commitments, practical steps, and concrete plans and timetables such that the U.S. and Russian programs can reasonably be said to be heading in the same general direction in the same overall timeframe. The United States would not construct new surplus plutonium disposition facilities until that expectation was satisfied. While joint U.S. and Russian efforts to disposition surplus plutonium are part of DOE's mission and while this SPD EIS notes the U.S. policies, the U.S. policies on this issue are beyond the scope of this SPD EIS. The Secretary of Energy has testified on numerous occasions regarding those policies. A recent testimony, to the House Committee on Science on May 20, 1999, can be found on the DOE Web site at http://www.doe.gov. Regardless of Russia's progress, DOE would begin immobilizing surplus plutonium in accordance with the decisions made in the SPD EIS ROD.

FD314–7 **Nonproliferation**

During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile. This document was added to Appendix A of this SPD EIS. The quantities and location of Russian plutonium, military or civil, are beyond the scope of this SPD EIS and are the subject of sensitive negotiations between the United States and Russia. It has never been a requirement or expectation of the United States that Russia's plans and programs for surplus plutonium

3

Congress, the public, and other government agencies to assess whether disposition is in fact "proceeding in parallel."

1. Exactly what is required on the Russian side in this regard?

2. What is the U.S. Government's best estimate of the total inventory of plutonium in Russia, exclusive of that still in spent civil power reactor spent fuel?

3. What is the U.S. Government's best estimate of Russia's weapon-grade plutonium inventory?

4. What are the U.S. Government's best estimates of Russia's separated fuel-grade and reactor grade inventories?

5. What are the U.S. Government's best estimates of Russia's "military and non-military plutonium stockpiles? 7

6. Where are these materials located in Russia to the best of the U.S. Government's knowledge?

7. Is the plutonium recovered from Russian naval reactor fuel that is currently stored at Mayak (along with Pu separated from VVER-440 spent fuel) considered to be part of Russia's military or civil plutonium stockpile?

8. Is the plutonium currently being recovered from plutonium production reactor fuel at Tomsk-7 and Krasnoyarsk-26 considered to be part of Russia's military or civil plutonium stockpile?

9. The terms "military plutonium" or "weapons plutonium" need to be more precisely defined; in particular, do these terms include plutonium derived from research or civil reactors and how do these terms relate to U.S. and Russian plutonium stockpiles as they are currently defined.

10. Please elaborate on the what is military and what is civil plutonium in the two countries.

11. For example, is plutonium in FFTF spent fuel military or civil?

V. On September 2, 1998, Presidents Clinton and Yeltsin signed an agreement that directs officials in both countries to draw up detailed plans and schedules for each country to dispose of 50 t of excess plutonium. The DEIS fails to provide information regarding the following questions:

1. Has Russia identified the sources of its 50 t of excess plutonium? 8

2. What fraction is weapon-grade?

3. What fraction is from pits removed from dismantled nuclear weapons, and what fraction, if any, is in other forms?

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disposition would proceed in lock-step with the U.S. program. The intermediate steps of the two programs and their precise timing do not have to be the same, provided the Russians are drawing down their stocks of surplus plutonium along agreed paths and in general consonance with the timing of the U.S. program. What is required of Russia is a combination of political actions and commitments, practical steps, and concrete plans and timetables such that the two programs can reasonably be said to be heading in the same general direction in the same overall timeframe.

The terms "military plutonium" and "weapons plutonium" are not used in this EIS. Weapons-grade and weapons-usable material are defined in Chapter 6. All the plutonium that is the subject of this EIS is considered weapons usable. The vast majority of this material, with the exception of fuel for FFTF, was associated with military use.

FD314–8 **Nonproliferation**

The sources, composition, form, and quantities of Russian surplus plutonium are the subject of sensitive negotiations between the United States and Russia and are beyond the scope of this SPD EIS.

4

4. Assuming it is all from pits, which is NRDC's current understanding, if the U.S. and Russia each completed the disposition of their respective 50 t of excess plutonium in accordance with the above cited presidential agreement but disposed of no more plutonium, would the U.S. and Russia have achieved approximately equal levels of military plutonium stockpiles, and therefore be in accord with the 1996 agreement cited above?

5. If the answer to V.4. above is "no," how much additional plutonium would Russia and/or the U.S. have to dispose of to achieve approximately equal military plutonium stockpiles? 8

VI. The SPD DEIS fails to discuss any of the important physical security, material accounting and control, or international safeguards issues that concern the facilities used under the MOX and vitrification options. With regard to physical security, what are the design-basis external-assault threats and internal threats that will be used to judge the adequacy of the physical security at the proposed MOX fabrication facility? 9

VII. For safeguards purposes, the IAEA defines a "significant quantity" (SQ) of nuclear material as "the approximate quantity of nuclear material in respect of which, taking into account any conversion process involved, the possibility of manufacturing a nuclear explosive device cannot be excluded."[4] For direct-use material, the IAEA currently assumes an SQ of 8 kilograms (kg) of plutonium.

The SQ values were recommended to the IAEA by a group of experts, namely, the IAEA's Standing Advisory Group for Safeguards Implementation (SAGSI), and "relate to the potential acquisition of a first nuclear explosive by a non-nuclear weapon state."[5] The direct-use values—8 kg of plutonium, 8 kg of uranium-233, or 25 kg of HEU—are also referred to by the IAEA as "threshold amounts," defined as "the approximate quantity of special fissionable material required for a single nuclear device."[6] The IAEA cites as a source for these threshold amounts a 1967 United Nations document.[7] The IAEA states: 10

> "These threshold amounts include the material that will unavoidably be lost in manufacturing a nuclear explosive device. They should not be confused with the minimum critical mass needed for an explosive chain reaction, which is smaller.[34]

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[4] *IAEA Safeguards Glossary, 1987 Edition*, IAEA, IAEA/SG/INF/1 (Rev. 1), 1987, p. 23.

[5] Thomas Shea, "On the Application of IAEA Safeguards to Plutonium and Highly Enriched Uranium from Military Inventories," IAEA, (June 1992, with additions: December 1992).

[6] *IAEA Safeguards Glossary*, p. 23.

[7] *Effects of the Possible Use of Nuclear Weapons ...*, United Nations, A/6858, 6 October 1967.

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FD314–9 **DOE Policy**

DOE has studied these issues in the *Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Materials Storage and Excess Plutonium Disposition Alternatives* (DOE/NN-0007, January 1997). As described in Chapter 2 (Volume I) of this SPD EIS, all of the proposed surplus plutonium disposition facilities would be built to DOE's highest security standards and are being proposed at sites where there is already a security force in place. Additional guards and security personnel would be hired to work at each of the facilities as needed and are included in the estimated workforce requirements evaluated in this EIS. Once it is determined where the proposed facilities would be located, a specific security plan would be developed and implemented, which considers all of the threats that could affect the facility. With regard to the MOX facility, physical security would be in accordance with NRC standards and be part of the NRC licensing process. The international safeguards associated with these facilities are the subject of ongoing sensitive negotiations between the United States and Russia. However, space has been allocated in each of the proposed facilities to accommodate such inspections.

FD314–10 **Nonproliferation**

As discussed in Section 2.4, it is likely that the United States would voluntarily offer to have the proposed surplus plutonium disposition facilities placed under international safeguards. However, the process of implementing international safeguards is not as yet fully defined. If these proposed facilities come under IAEA oversight, it is expected that the "significant quantity" as defined by IAEA in safeguarding the proposed facilities would be the same as that used by IAEA for safeguarding plutonium in other nations. Any discussion on the amount of plutonium needed to build a 1-kiloton weapon is classified and is beyond the scope of this SPD EIS.

The remainder of this comment is addressed in response FD314–9.

> [34] Using highly sophisticated techniques available to NW States, the critical mass and the corresponding threshold amount can also be significantly reduced, but these are special cases that need not be considered here."

For decades the IAEA has set invalid technical thresholds for the minimum quantity of nuclear material needed for a nuclear weapon, even for a low-technology first nuclear explosive by a non-nuclear weapon state, including consideration of unavoidable losses.

First, the current 8 kg SQ value for plutonium is consistent with assuming a 24 percent loss in fabricating a solid 6.1 kg plutonium core similar to the Trinity device or the Nagasaki bomb—equivalent to losing the outer 0.4 cm of the 4.5 cm core during casting and machining. This degree of imprecision seems exceptionally high for the numerically controlled techniques now available in the commercial marketplace.

Second, if one took the same *Fat Man* design, first tested at the *Trinity* site in New Mexico and dropped on Nagasaki in 1945, and simply substituted a three kg plutonium core for the 6.1 kg core that was used in 1945, the yield of this device would be on the order of one kiloton, still a very respectable atomic bomb that could create catastrophic losses in dense urban areas. Thus, based on this evidence alone, the IAEA is in error to assert that "highly sophisticated techniques available to NW States" are needed to make nuclear weapons with "significantly reduced" quantities of materials.

Third, since the early 1950's, the nuclear-weapon states have been producing nuclear explosives with yields in the several kiloton range from as little as 2 kg of plutonium. The so-called "highly sophisticated techniques available to NW States" referenced by the IAEA were known to U.S. weapons designers in the late-1940s and early 1950s—and are now available to anyone with the patience and skills to search the open technical literature. Nuclear devices using very small quantities of plutonium and HEU—so-called "fractional crit" weapons—with yields on the order of one Kt were tested during the Ranger series in 1951. 10

Finally, a well advised safeguards program for a given country or group of countries would set the "significant quantity" levels at values less than the minimum amount needed for a weapon, to guard against the fact that materials can be diverted from more than one source. The practice of setting higher levels to account for manufacturing losses is likewise imprudent, particularly in view of the fact that a significant fraction of these "losses" are technically recoverable. In sum, *safeguards apply to all non-weapons countries, irrespective of their technological sophistication, and safeguards effectiveness should be assessed with this fact in mind.*

Many IAEA-member countries, including Israel, India and Pakistan and several that are not declared nuclear weapon states, such as Japan, Germany, South Korea, have highly developed nuclear infrastructures, and must be considered technologically sophisticated. Israel is presumed to have deployed boosted fission weapons, and possibly two stage thermonuclear weapons. India claims to have tested a two-stage thermonuclear device this year. This claim is certainly credible given that it has been 24 years since its first nuclear weapon test in 1974. Even for countries that

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are in general not sophisticated technologically, such as North Korea, the key technical information needed to establish a program for achieving substantial compression via implosion techniques is now accessible in the unclassified literature. The quantities defining safeguards significance, therefore, must be based on the assumption that the proliferator has access to "advanced" technology (*i.e.*, at least 1950's era). Whatever the nonproliferation "disinformation benefit" that may have flowed from the under-protective IAEA SQ values in the past, it is now far too late in the proliferation game to base the international nuclear control regime on flawed technical premises. As a consequence, the IAEA's SQ value should be lowered to no more than one eighth of the current value.

In 1994, NRDC released a report, "The Amount of Plutonium and Highly-Enriched Uranium Needed for Pure Fission Nuclear Weapons" (NRDC, Revised April 1995). In this report and in accompanying letter to the IAEA, NRDC requested that the IAEA revise its SQ value downward by a factor of eight. At about the same time the NRDC also requested that the United States Government, represented on the IAEA Board of Governors, take appropriate action to have IAEA make this revision.

DOE never responded to NRDC's request. It is our understanding that DOE had drafted a letter to NRDC endorsing lowering the IAEA SQ value by a factor of two—to four kg of plutonium—but that the State Department objected to it and that it was never sent.[8] 10

1. Will the proposed MOX fabrication plant be subject to IAEA and/or bilateral safeguards?

2. What in DOE's view is the technically indicated SQ value that the IAEA should be using?

3. What in DOE's view is the technically indicated SQ value that DOE is, or should be, using?

4. What constitutes a "significant quantity" of plutonium for purposes of judging the adequacy of the material control and accounting measures at the MOX fabrication plant?

5. Is the SQ value for the MOX fabrication plant different from that used by the IAEA? If so, explain why.

6. Does DOE agree that a one-kiloton-yield fission weapon can be made with as little as one to three kilograms of weapon-grade plutonium?

8 The letter was prepared for Mr. Ken Luongo, Director of the Office of Nonproliferation at DOE, and it was killed by Mr. Robert Einhorn at the State Department.

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VIII. NRDC does not believe the proposed MOX fabrication plant can be operated with adequate material control and accounting procedures. In the parlance of nuclear material accounting, the inventory difference (ID) is defined as:

$$ID = BI + I - R - EI,$$

where BI is the beginning inventory, EI is the ending inventory, and I and R are, respectively, the material added and removed during the inventory period.[9] For the minimum amount of diverted plutonium (assumed by the IAEA to be the SQ value—currently 8 kg of plutonium) to be resolvable from measurement noise with detection and false alarm probabilities of 95% and 5%, respectively, it can be shown that 3.3 σ_{ID} must be less than the SQ value, where σ_{ID} is the uncertainty in the inventory difference.[10] For an SQ of 8 kg the σ_{ID} would have to be about 3 kg; and if the SQ value for plutonium were lowered to one kg, σ_{ID} should not exceed about 300 grams.

At Japan's Tokai Plutonium Fuel Production Facility (PFPF), where MOX fuel has been fabricated for Japan's Joyo and Monju fast-breeder reactors since 1988, the production line consisted of 17 interconnected glove boxes monitored by unattended, tamper-proof instruments, such as neutron coincidence counters. Following an April 1994 inspection conference with the IAEA, Japanese sources disclosed that on the order of 70 kg of plutonium was "held up" in the remotely monitored process line, and that the uncertainty in the hold-up material exceeded the 8 kg SQ value used by IAEA. 11

1. Identify the limit on σ_{ID} that DOE believes must be achieved in the MOX fabrication plant to provide technical detection with high confidence of the theft or diversion of a technically valid SQ of special nuclear material.

2. Explain how this limit will be achieved?

3. Please provide the historical ID data for other MOX and related facilities relevant to making an informed judgment as to whether technically adequate material control and accounting standards can be achieved at the proposed MOX plant.

4. What is the basis, if any, for believing that the proposed MOX plant would achieve inventory differences significantly less than those experienced at Japan's PFPF.

IX. To improve material control, large facilities that process or store nuclear weapon-usable materials are subdivided into numerous "material balance areas." The inventories and inventory differences within individual balance areas can be significantly smaller than those for the entire 12

9 In the literature "inventory difference" (ID) is sometimes called "material unaccounted for" (MUF).

10 Marvin Miller, "Are Safeguards at Bulk-Handling Facilities Effective?, Nuclear Control Institute, Washington, D.C., August 1990.

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FD314–11 **Nonproliferation**

NRC material control and accountability requirements would apply to the MOX facility, or potentially a combination of NRC and DOE requirements. If the decision is made in the SPD EIS ROD to go forward with the MOX facility, a limit on σ_{ID} would be established based on discussions with NRC and the approved NRC facility design. Any material control and accountability requirements would have to also satisfy international safeguards requirements agreed to between the United States and Russia. Existing IAEA standards, which would likely be similar to those implemented at the proposed MOX facility, are in place at MOX fuel fabrication facilities in Europe. These facilities have been able to meet the IAEA standards supporting DOE's belief that the proposed MOX facility would be able to meet similar standards. DOE is aware of the issues surrounding the problems referred to by the commentor in the Japanese facility and would work to avoid similar problems at the MOX facility.

FD314–12 **Nonproliferation**

The specific arrangements for applying international safeguards (including significant quality limits) at the MOX facility have not been fully determined. As discussed in response FD314–9, international safeguards are part of the sensitive negotiations between the United States and Russia. Final arrangements would be made during design and construction of the facility. Safeguards and security requirements, as well as material control and accountability requirements, would take into consideration internal and external threats involving the theft and diversion of nuclear materials and limits would be set accordingly.

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facility. The SQ limits are often applied to the separate material balance areas. It must be recognized, however, that this approach does not afford adequate protection against state-sponsored diversions or a collusion of individuals removing materials from separate material balance areas. 12

1. In the SPD Final EIS indicate whether DOE agrees that the SQ limits should apply to the entire MOX facility? If not, explain why.

X. NRDC does not believe an adequate timely detection criterion can be met. Detection time (the maximum time that should elapse between diversion and detection of a significant quantity) should be in the same range as the conversion time, which is defined as the time required to convert different forms of nuclear material into components of nuclear weapons. For metallic plutonium, the conversion time is 7-10 days; for other forms of plutonium, it is 1-3 weeks. These conversion times are already much shorter than the period between inventories at any MOX plant operating today. Thus, there can be no assurance that the primary objective of safeguards—the timely detection of the theft, loss, or diversion of significant quantities of plutonium—will be met at the proposed MOX fabrication plant. 13

1. What timely warning criterion will be used for judging the adequacy of safeguards at the proposed MOX fabrication plant?

2. What is the basis for DOE's belief that the timely detection criterion can be met?

This concludes NRDC's comments on the SPD DEIS.

Sincerely,

Thomas B. Cochran
Director, Nuclear Program

FD314

FD314–13 **Nonproliferation**

Specific domestic and international safeguards would be developed during design and construction of the MOX facility. Because the surplus plutonium is weapons usable, the safeguards would include physical inventories as well as several active and passive measures. A single, integrated system of material control measures and accountability measurements would be used to monitor storage, processing, and transfer of nuclear material in the MOX facility. The facility accountability program would include an accounting system, a measurement and measurement control program, physical inventory programs, a material transfer program, and a program to assess material control indicators.

The accounting system would be a near real–time system that would require the prompt reporting of any change in the accountable quantity, location, user, or form of the nuclear material. This system would include measurement subsystems, and both destructive and nondestructive assay to ensure that quantities of nuclear materials were stated with the timeliness, accuracy, and precision required in DOE/NRC regulations and any international agreements. These material control and accountability measures would ensure that potential theft, loss, or diversion of material would be detected well before that material could be converted into a nuclear weapon.

NUCLEAR CONTROL
INSTITUTE

1000 CONNECTICUT AVE NW SUITE 804 WASHINGTON DC 20036 202•822•8444 FAX 202•452•0892
E-mail nci @access.digex.net Web http://www.nci.org/nci/

September 16, 1998

Office of Fissile Materials Disposition
c/o SPD EIS
U.S. Department of Energy
P.O. Box 23786
Washington, DC 20026-3786

Comments of the Nuclear Control Institute
on the Surplus Plutonium Disposition
Draft Environmental Impact Statement

The Nuclear Control Institute ("NCI") submits the following comments on the Department of Energy's Surplus Plutonium Disposition Draft Environmental Impact Statement (DOE/EIS-0283-D, July 1998) ("draft EIS"). Bracketed page numbers in these comments refer to this document.

1. The Department of Energy should utilize exclusively the immobilization approach to surplus plutonium disposition in the United States. The MOX approach under the "dual track" disposition policy is not justified even if there is a need to proceed in parallel with Russia.

DOE's January 1997 Record of Decision on Plutonium Disposition outlined a "dual track" approach utilizing both immobilization and MOX. The Department has defended this approach as a prerequisite to working in parallel with Russian counterparts who view plutonium as "national treasure" and are unwilling to dispose of it as waste. NCI remains unconvinced by this argument, for reasons explained in detail elsewhere.[1] 1

However, DOE's rationale for the "dual track" was recently superseded by the plutonium disposition agreement signed by Presidents Clinton and Yeltsin at their Moscow summit meeting. This agreement marked Russia's first formal acknowledgement of the acceptability of the immobilization approach. The agreement specifies that "[t]he two governments will cooperate to pursue this goal [of each nation disposing of 50 metric tons of surplus weapons plutonium] through consumption of plutonium fuel in existing nuclear reactors (or reactors which may enter

[1] Edwin S. Lyman and Paul Leventhal, "Bury the Stuff," Bulletin of the Atomic Scientists, March/April 1997, pp. 45-48.

Strategies for stopping the spread and reversing the growth of nuclear arms.

FD327

FD327–1 **Nonproliferation**

DOE acknowledges the commentor's opposition to the use of plutonium in MOX fuel. Russian cooperation is not the only reason DOE has identified as its preferred alternative the hybrid approach for the disposition of U.S. surplus plutonium. The environmental impacts associated with the immobilization-only alternatives—as well as the hybrid (MOX and immobilization) and the no action alternatives—are discussed in this SPD EIS. Costs are discussed in two reports prepared by DOE, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, and *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative. These reports are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

DOE believes the hybrid approach provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again. Pursuing both the immobilization and MOX approaches also provides important insurance against potential disadvantages of implementing either approach by itself. DOE reserves the option to immobilize all the surplus plutonium as discussed in Alternatives 11 and 12 and has evaluated the environmental impacts of these alternatives (including considering the number of facilities, the number of processing stages, and the transportation requirements).

In regard to the MOX facility, DOE intends to design, construct, and operate it in such a fashion as to provide a level of safety that meets or exceeds applicable Federal, State, and local requirements. The MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition

NUCLEAR CONTROL INSTITUTE
STEVEN DOLLEY
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into service during the duration of our cooperation) or the immobilization of plutonium in glass or ceramic form mixed with high-level radioactive waste."[2] [emphasis added]

In light of this agreement, and DOE's acknowledgement in both the ROD and draft EIS that it is technically feasible to immobilize all 50 tons of surplus U.S. weapons plutonium, there is no imperative to pursue a MOX approach in the United States at all. DOE's own studies demonstrate that immobilization would be cheaper, faster and safer than the MOX approach,[3] and is therefore the more desirable method now that it is clear MOX need not be pursued in the United States to satisfy Russian concerns. 1

In the most straightforward sense, immobilization has clear-cut environmental and safety advantages. Fewer processing stages, fewer facilities, and less transportation are involved with immobilization than with MOX. The immobilization-only approach also offers great flexibility for the U.S. disposition program. If desired, the United States could promptly and unilaterally immobilize all 50 tons of its surplus plutonium, as a demonstration and incentive to Russian disposition. If parallelism and Russian reciprocity were deemed important but did not materialize, a U.S. immobilization-only approach could be put on hold with far less disruption than a MOX/reactor approach.

2. The draft EIS comparison of MOX and immobilization is unfairly skewed in favor of MOX.

The draft EIS assesses site-specific environmental impacts of the immobilization process all the way through to production of the final waste form. The MOX approach, on the other hand, is only analyzed on a generic basis after the point at which fresh MOX fuel is fabricated. Analysis of environmental and safety questions related to use of specific reactors and storage of spent MOX fuel is relegated to a separate "environmental critique" which will not be available until the final EIS is released. This provides an unbalanced comparison of the MOX and immobilization options. NCI is preparing an in-depth technical analysis of safety issues related to the use of weapons-plutonium MOX fuel in light-water reactors, and this analysis would be greatly enhanced by the availability of reactor-specific data. Environmental impacts of MOX fuel use could vary widely from site to site (i.e., the North Anna plant vs. WNP-2). Therefore, issuance of the final EIS should be deferred until the public has a reasonable opportunity to 2

[2] Joint Statement of Principles for Management and Disposition of Plutonium Designated as No Longer Required for Defense Purposes," September 2, 1998.

[3] For example, ceramic can-in-canister immobilization could begin two years sooner than a MOX-immobilization "hybrid option," and be completed six years sooner. U.S. DOE, Office of Fissile Materials Disposition, Technical Summary Report for Surplus Weapons-Usable Plutonium Disposition, Rev. 1, October 31, 1996, Table ES-2, p. ES-11. DOE estimates that an immobilization-only alternative would cost from \$1.7 to \$1.9 billion, whereas the hybrid alternatives would cost from \$1.8 billion to \$2.1 billion (with fuel offset) or from \$2.7 to \$2.9 billion (without fuel offset). U.S. Department of Energy, Office of Fissile Materials Disposition, Cost Analysis and Support of Site Selection for Surplus Weapons Usable Plutonium Disposition, DOE/MD20009, July 22, 1998, Table 3-2, p. 3-17; Table 3-3, p. 3-18.

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of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provides general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials.

FD327–2 **MOX RFP**

The SPD Final EIS was not issued until the proposed reactors had been identified and the public had an opportunity to comment on the reactor-specific information. As part of the procurement process, bidders were asked to provide environmental information to support their proposals. This information was analyzed in an Environmental Critique prepared for the DOE source selection board prior to award of the MOX fuel fabrication and irradiation services contract. DOE then prepared an Environmental Synopsis on the basis of the Environmental Critique, which was released to the public as Appendix P of the *Supplement to the SPD Draft EIS* in April 1999. This *Supplement* included a description of the affected environment around the three proposed reactor sites, and analyses of the potential environmental impacts of operating these reactors using MOX fuel (Sections 3.7 and 4.28 of this SPD EIS, respectively). During the 45-day period for public comment on the *Supplement*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. Responses to those comments are provided in Volume III, Chapter 4.

review and comment upon the reactor-specific environmental critique. 2

3. Issues related to plutonium oxide "hold up" in the MOX fuel fabrication facility should be addressed.

In modern MOX fuel fabrication facilities, almost all operations are carried out by remote handling in glove boxes. Significant portions of the plutonium oxide throughput of these plants can become "held up" in these glove boxes. Since opening in 1988, the small, pilot PFPF MOX plant in Japan accumulated a hold-up of over 70 kilograms of plutonium, and the plant operator was eventually required by the International Atomic Energy Agency to clean out and account for this material, at a cost of over $100 million. 3

NCI has expressed concern about the hold-up issue in a non-proliferation and safeguards context.[4] From a NEPA perspective, it should be noted that plutonium hold-up constitutes a safety and health risk, not only to MOX plant workers but to the general public by increasing the plant's source term in case of an accident. If required later because of excessive hold-up, a full facility clean-out would also pose significant risks of worker exposure to plutonium. The draft EIS does not address the hold-up issue. It is important that the final EIS do so.

4. The "plutonium polishing" option should not be pursued.

DOE has offered respondents to its request for proposals for MOX disposition work the opportunity to propose aqueous processing, so-called "plutonium polishing," to remove gallium and other impurities from plutonium prior to its fabrication into MOX fuel. The detrimental effects of gallium on fuel cladding and reactor safety have not been fully documented and could prove significant. "Plutonium polishing" would significantly increase the environmental impact of the MOX option by creating large amounts of TRU and low-level waste, an increase of 10 to 20 percent over non-polishing options.[5] It would also contravene U.S. non-proliferation policy, in that it would be likely to provide strong support of Russia's plans for aqueous treatment of its own surplus weapons plutonium. Because trace amounts of gallium do not affect the immobilization process or final waste form, the plutonium polishing step could be avoided entirely if the U.S. were to pursue an immobilization-only approach. 4

5. Lengthy storage of fresh MOX fuel at reactor sites poses security risks and should be avoided.

The draft EIS foresees a 10-year operational life for the MOX fabrication plant, but considerable additional time, possibly years, would be required to cycle all this MOX fuel through reactors. NCI objects to long-term storage of fresh MOX fuel at reactor sites on security grounds. Such fresh MOX fuel lacks a radiation barrier, and if stolen, weapons-grade plutonium 5

[4] Steven Dolley, Nuclear Control Institute Comments on the Draft PEIS for Plutonium Disposition, June 7, 1996.

[5] "Appendix N: Plutonium Polishing," draft EIS, pp. N-8 - N-9.

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FD327–3 Nonproliferation

DOE is aware of a Japanese plutonium processing incident in which the holdup of a significant amount of MOX powder in the processing lines made it difficult to measure the exact quantity of materials from outside the sealed gloveboxes. The design and operation of the MOX facility would incorporate lessons learned (regarding procedures and equipment) to ensure a low net plutonium loss and would be compatible with NRC and international safeguards. Physical inventories, measurements, and inspections of material both in process and in storage would be used to verify records and ensure that there was no significant holdup of plutonium in the gloveboxes.

FD327–4 Plutonium Polishing and Aqueous Processing

DOE acknowledges the commentor's opposition to the MOX approach and plutonium polishing. On the basis of public comments received on the SPD Draft EIS, and the analysis performed as part of the MOX procurement, DOE has included plutonium polishing as a component of the MOX facility to ensure adequate impurity removal from the plutonium dioxide. While it is true that plutonium polishing would add to the amount of LLW and TRU waste generated, this amount should be a small fraction of the total amount of these waste types generated at the candidate sites. For example, at SRS, which is the preferred site for the MOX facility, the addition of the plutonium-polishing process would be expected to increase the site's projected generation of LLW and TRU waste by less than 1 percent and 2 percent, respectively. Section 4.32.4 discusses the cumulative impacts of the proposed action at SRS; Sections 4.32.1, 4.32.2, and 4.32.3, the cumulative impacts of the proposed action at Hanford, INEEL, and Pantex, respectively.

FD327–5 MOX Approach

DOE acknowledges the commentor's concern about the storage of fresh MOX fuel at reactor sites. The proposed action does not involve lengthy storage of fresh fuel at reactor sites. Moreover, as discussed in Section 2.4.3.2, the MOX fuel would be managed in essentially the same way as fresh LEU fuel (with tighter security because of the plutonium), which is usually received at the reactor site shortly before it would be inserted into the reactor. The MOX facility includes space for storage of up to 2 years' worth of fresh fuel could be separated from this MOX by straightforward chemical means. EDF, the French nuclear utility, does not permit fresh MOX fuel to be stored at its reactor sites for more than two weeks, and does not allow any dry storage of such fresh fuel.[6] The same strict security requirement should be imposed on MOX fuel storage, and the additional costs of meeting this storage standard, and of additional security at reactor sites, should be included in the EIS. 5

6. The "216 process" is an inappropriate approach to safety analysis of MOX candidate reactors.

DOE proposes to analyze environmental impacts of specific commercial reactors offered by consortia for MOX fuel irradiation by means of the process specified in 10 CFR 1021.216 (the "216 process"). This regulatory language is part of DOE's NEPA Implementing Regulations, and provides for an "environmental critique," to be prepared by DOE, which "may contain proprietary information which will, therefore, not be made available to the public." [p. S-12] A synopsis will be published in the final EIS, but the full environmental critique would never be made public.

The proposed implementation of the 216 process is entirely unacceptable. First, DOE has indicated that consortia bidders will have complete discretion to determine which information they submit to DOE should be considered "proprietary" and withheld from the public. Thus, any information bearing on the safety of reactors fueled with MOX that the industry does not want subjected to public scrutiny could be withheld. Second, the public synopsis would not be made available until the *final* EIS is released, i.e., after the public input process under NEPA is completed. Public comments on the final EIS are unlikely to have any significant impact on DOE's record of decision. 6

An example of the abuse that can arise from excessive discretion to withhold release of "proprietary" data in regulatory proceedings is the recent revelation in Great Britain that "a supposedly independent report by the accountancy firm Touche Ross - used to provide the economic justification for the Thorp reprocessing plant - had never been drawn up....Environmentalists, independent scientists and the Labour Party in opposition all called for the report to be published, but BNFL which runs Sellafield, refused to do so on the grounds that it was commercially confidential. Recently the Environment Minister, Michael Meacher, asked to see the report but was told, to his amazement, that it did not exist."[7]

DOE has discretion to apply the standards of law in order to determine whether data that the consortia want to be withheld in fact meets these standards. DOE should review this material, with a presumption in favor of public release. The provisions of DOE NEPA regulations which require withholding of "commercially confidential" information should be narrowly interpreted

[6] D. L. Williams Jr., "Licensing Issues Associated with the Use of Mixed-Oxide Fuel in U.S. Commercial Nuclear Reactors," Oak Ridge National Laboratory Report, ORNL/TM-13421, April 1997, p. 9.

[7] Geoffrey Lean, "Report that Justified Thorp Nuclear Plant Never Existed," Independent on Sunday, September 13, 1998.

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assemblies, which was included in the cost estimates for the MOX facility. Any actual restrictions or requirements related to the storage of fresh MOX fuel at the proposed reactor sites would be imposed by NRC as part of the operating license amendment process.

FD327–6 **MOX RFP**

DOE has withheld no information regarding reactor-specific safety analyses conducted for this SPD EIS. Those analyses are discussed in Section 4.28.2.5.

The remainder of this comment is addressed in response FD327–2.

and applied, in order to assure that the maximum amount of data is made available to the public consistent with the requirements of law. The Department should err on the side of disclosing, rather than withholding, and this policy governing the 216 process should be stated clearly in the final EIS. 6

7. Issues related to burnup levels of irradiated MOX fuel should be addressed.

The draft EIS merely refers to the 1996 PEIS's generic safety analysis of MOX fuel irradiation in LWRs. It does not incorporate new information on safety issues related to the burnup level of MOX fuel. In light of recent findings that "MOX fuel shows a higher failure potential than UO_2 at comparable burn up," as revealed by a recent MOX fuel experiment at the Cabri test reactor in France,[8] significant consideration should be given to limiting average burnup of MOX fuel to the regulatory ceiling of 36,000 MW-D/MTHM now imposed in France.[9] This is the only way to avoid with assurance the risks associated with the propensity of high-burnup MOX fuel to catastrophically rupture in the event of reactivity transients or loss-of-coolant accidents (LOCAs). 7

This problem may be more severe for weapons-grade MOX because the phenomenon believed to be responsible for the inferior behavior of MOX fuel (locally high burnups and fission gas release because of the inhomogenous distribution of plutonium in MOX fuel) would be exacerbated by the higher fission rates that occur in weapons-grade plutonium.

8. Additional NEPA analyses might be required.

A number of significant federal actions are mentioned in the draft EIS as potential options that might be pursued in the disposition program. These actions include the "plutonium polishing" option, irradiation of U.S. and Russian MOX in CANDU reactors in Canada, and fueling the Fast Flux Test Reactor (FFTF) with weapons-plutonium MOX to produce tritium for the U.S. nuclear arsenal. We note and concur with DOE's position in the draft EIS that, in each case, additional NEPA analysis beyond the SPD EIS would be required if any of these actions were to be pursued. 8

Sincerely,

Steven Dolley
Research Director

[8] F. Schmitz, Institute de Protection et de Surete Nucleaire (IPSN), "The Status of the Cabri REP-Na Test Programme: Present Understanding and Still Pending Questions," presentation to the NRC/Industry Meeting on High-Burnup Fuel Issues, Rockville, Maryland, November 18-20, 1997.

[9] Jean-Luc Provost, Electricite de France, "Plutonium Recycling and Use of MOX Fuel in PWR: EDF Operating Experience," Industry Presentation to NRC on the Use of MOX Fuel, Rockville, Maryland, February 21, 1997.

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FD327–7 **MOX Approach**

Section 4.28 was revised to provide reactor-specific analyses and discuss the potential environmental impacts of using a partial MOX core during routine operations and reactor accidents. The referenced failure of the Cabri fuel in the French experiment was not related to the fact that the failure involved MOX fuel. Even if the test failure were actually related to MOX fuel, the significance would be questionable, for tests were conducted on a contrived set of conditions to explore regions of performance well outside the operating regime for commercial reactors. The tests were designed to test enthalpies of high burnup fuels, both LEU and MOX, under severe transient conditions. Although other factors would also invalidate the application of the Cabri test data to the U.S. MOX fuel case, the most important characteristic of the test fuel—high burnup—would not apply because the MOX fuel is planned for irradiation for only two cycles, resulting in a maximum burnup of only 45,000 MW-day/MTHM. The acceptability of burnups at this level has been aptly demonstrated in Belgian, French, and German reactors.

FD327–8 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's views that additional NEPA analysis beyond this SPD EIS would be required for the use of CANDU reactors and the restart of FFTF. In the SPD Draft EIS, DOE retained the option to use some of the surplus plutonium as MOX fuel in CANDU reactors, which would have only been undertaken in the event that a multilateral agreement were negotiated among Russia, Canada, and the United States. Since the Draft was issued, DOE determined that adequate reactor capacity is available in the United States to disposition the portion of the U.S. surplus plutonium that is suitable for MOX fuel and, therefore, while still reserving the CANDU option, DOE is no longer actively pursuing it. However, DOE, in cooperation with Canada and Russia, proposes to participate in a test and demonstration program using U.S. and Russian MOX fuel in a Canadian test reactor. A separate environmental review, the *Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment* (DOE/EA-1216, January 1999), analyzes the fabrication and proposed shipment of MOX fuel rods for research and development activities involving the use of limited amounts of U.S. MOX fuel in a Canadian test reactor. A FONSI was signed on August 13, 1999.

Both of these documents can be viewed on the MD Web site at http://www.doe-md.com. If a decision is made to dispose of Russian surplus plutonium in Canadian CANDU reactors in order to augment Russian's disposition capability, shipments of the Russian MOX fuel would take place directly between Russia and Canada.

As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source. DOE has included plutonium polishing as a component of the MOX facility. Section 2.18.3 and the hybrid alternatives analyses in Chapter 4 of Volume I were revised to include the impacts associated with plutonium polishing.

NEI
NUCLEAR ENERGY INSTITUTE

Felix M. Killar
DIRECTOR,
MATERIAL LICENSEES
& NUCLEAR INSURANCE

September 21, 1998

Mr. G. Bert Stevenson
NEPA Compliance Officer
Office of Fissile Materials Disposition
U.S. Department of Energy
SPD EIS
P.O. Box 23786
Washington, DC 20026-3786

Subject: Request for Comments on "*Surplus Plutonium Disposition Draft Environmental Impact Statement*" (SPD EIS) (DOE/EIS-0283-D)

Dear Mr. Stevenson:

The Nuclear Energy Institute (NEI)[1] is pleased to provide comments on "*Surplus Plutonium Disposition Draft Environmental Impact Statement*". The U.S. nuclear industry supports the disposition of weapons grade plutonium, in the United States and Russia as a very important national security and nonproliferation initiatives. We believe that consistent with the recommendation of the National Academy of Science, both mixed oxide fuel and the immobilization options must meet the spent fuel standard. As indicated in our attached comments we are concerned that the EIS and therefore the program may not be bringing the immobilization option to this standard. 1

We look forward to your consideration of our comments and to effectively and expeditiously implement this critical non-proliferation initiative. The industry has a great deal of interest in the MOX program and you will certainly receive comments from individual companies as well as those

[1] NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

1776 I STREET, NW SUITE 400 WASHINGTON, DC 20006-3708 PHONE 202.739.8000 FAX 202.785.4019

MD283

MD283–1 **DOE Policy**

DOE acknowledges the commentor's concern regarding the ability of the immobilization approach to meet the Spent Fuel Standard. In the *Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Excess Plutonium Disposition Alternatives* (DOE/NN-0007, January 1997), DOE identified two potential liabilities of the immobilization alternatives relative to the Spent Fuel Standard. These liabilities involve ensuring sufficient radiation levels and providing removal-resistant can-in-canister designs. Since that time, DOE has modified the can support structure inside the canisters and has focused its research on the ceramic form of immobilization. As part of the form evaluation process, an independent panel of experts determined (*Letter Report of the Immobilization Technology Peer Review Panel*, from Matthew Bunn to Stephen Cochran, LLNL, August 21, 1997) that the can-in-canister design would meet the Spent Fuel Standard. In terms of plutonium 240 content, it is not necessarily required that isotopic dilution be used to make the material as inaccessible and unattractive for weapons use as the plutonium that exists in highly radioactive spent nuclear fuel from commercial reactors. In addition, NAS is currently conducting studies to confirm the ability of the ceramic can-in-canister immobilization approach to meet the Spent Fuel Standard. DOE is confident that immobilization remains a viable alternative for meeting the nonproliferation goals of the surplus plutonium disposition program.

NUCLEAR ENERGY INSTITUTE
FELIX M. KILLAR
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Mr. G. Bert Stevenson
U.S. Department of Energy
Page 2

submitted herein. If you have any questions concerning the information contained in this letter, please do not hesitate to contact me.

Sincerely,

Felix M. Killar

Attachment

MD283

Comments on the Department of Energy's (DOE's)
Surplus Plutonium Disposition Draft Environmental Impact Statement

Location	Comment
Executive Summary p. S-8	Specification of "can-in-canister" immobilization as a preferred alternative. DOE is proposing "can-in-canister" immobilization as its preferred alternative for immobilization. However, the DOE's own reports[2,3] indicate that "can-in-canister" immobilization does not currently meet the Spent Fuel Standard for long-term nonproliferation resistance. The United States must deploy an effective, accepted plutonium disposition technology or technologies if it wants to encourage international support for plutonium disposition. NEI expects that concurrent action on the part of Russia to dispose of its surplus plutonium will be predicated on the disposition of United States material in a manner that provides high confidence in its resistance to theft, diversion, or re-use.

1

Recommendations:
DOE should consider only those alternatives that meet the Spent Fuel Standard [i.e., mixed oxide (MOX) fuel and homogeneous immobilization] as preferred alternatives.
If the DOE pursues deployment of "can-in-canister" immobilization, the DOE should explain how it will demonstrate, in an open, objective, and peer-reviewed process, that the "can-in-canister" plutonium disposition approach will meet this fundamental program requirement - the Spent Fuel Standard. DOE should also explain why immobilized/"can-in-canister" does not have to meet the denatured aspect of the spent fuel standard i.e. the Plutonium 240 content will not be greater than 20%.

Location	Comment
Executive Summary p. S-14.	Quantities of plutonium considered in the EIS for disposal using the two approaches. The draft EIS states, "Since the ROD was issued, however, DOE has determined that an additional 9 tonnes of low plutonium content materials would require additional processing and would, therefore, be unsuitable for MOX fuel fabrication." DOE alternatives include disposing of a maximum of 33 tonnes of plutonium as MOX fuel, while the alternatives include immobilizing 50 tonnes of surplus plutonium.

2

DOE has never provided justification that any surplus plutonium is not suitable for MOX use. The DOE has not explained what form this "unsuitable" plutonium is in. The technology descriptions in the draft EIS make it clear that various kinds of processing will be used in the Conversion and Immobilization Facility. It would appear to be possible that some of this processing would render material that is suitable for fabrication into MOX fuel. Finally, the DOE has specified no requirements that the plutonium destined for either MOX fuel or immobilization must satisfy. Therefore, it seems very unlikely that there is any technical basis for any decision about quantities of plutonium that are suitable or unsuitable for either option.

[2] Sandia National Laboratories, SAND97-8203 - Proliferation Vulnerability Red Team Report, October 1996.

[3] U. S. Department of Energy, DOE/NN-0007 - Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Excess Plutonium Disposition Alternatives, January 1997.

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MD283–2 **Feedstock**

DOE reviewed the chemical and isotopic composition of the surplus plutonium and determined in the *Storage and Disposition PEIS* ROD that about 8 t (9 tons) of surplus plutonium were not suitable for use in making MOX fuel. Furthermore, DOE has identified an additional 9 t (10 tons) for a total of 17 t (19 tons) that have such a variety of chemical and isotopic compositions that it is more reasonable to immobilize these materials and avert the processing complexity that would be added if these materials were made into MOX fuel. The criteria used in this identification included the level of impurities, processing requirements, and the ability to meet the MOX fuel specifications. Section 2.2 includes a description of the forms of plutonium that would be used for MOX feed and immobilization feed. None of the material planned for immobilization is in the form of spent fuel, and all of it is considered weapons usable. A further description of the types and amounts of plutonium currently planned for disposition can be found in *Feed Materials Planning Basis for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0013, April 1997).

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Recommendation:
Given the lack of justification for any decision about quantities of material for the two options, DOE should include the evaluation of a 100% (50 tonne) MOX fuel alternative in the SPD EIS. This is the only way to preserve all appropriate options until the time that the DOE can make a technically defensible evaluation and decision on the allocation of material to the two plutonium disposition approaches. We have recently learn that the Russians do not believe the material that is planned for immobilization is truly weapons grade plutonium. If it is already in the form of spent fuel or contains contaminants such that it can't be used for weapons then it should not be considered as part of this program and additional pits should be identified. 2

Location	Comment
Appendix D, p. D-2	The appendix states "If it were determined that MOX fuel (rather than uranium-only fuel) were needed for the FFTF operations, the MOX fuel fabrication alternatives may be eliminated, depending on the amount of surplus plutonium that would be required for tritium production." However, it is our understanding that the capability to fabricate significant quantities of MOX fuel for the FFTF does not currently exist within the DOE complex.

Recommendation:
DOE should acknowledge that use of the FFTF with plutonium fuel in this manner would require the design and construction of a MOX fuel fabrication facility for the FFTF fuel or consider off shore production of MOX fuel. It is the light water reactor irradiation of MOX fuel that might be eliminated by such a course of action. 3

Location	Comment
Sections 2.17 and 2.18.	Hot cell examinations of irradiated lead assembly fuel. The environmental impacts in the draft EIS do not appear to include those impacts associated with hot cell examinations. In particular, there is no acknowledgment that the hot cell facilities would be responsible for the disposal of the spent nuclear fuel that results from destructive hot cell examinations.

Recommendation:
DOE should revise the EIS to include these impacts, or note that such impacts are already included in other environmental evaluations. 4

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MD283–3 **DOE Policy**

As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source.

MD283–4 **Lead Assemblies**

Section 2.18 was revised to include a description of the impacts of postirradiation examination of lead assemblies.

Nuclear Information and Resource Service

1424 16th St. NW, Suite 404, Washington, DC 20036; 202-328-0002; fax:202-462-2183; e-mail:nirsnet@igc.apc.org web:www.nirs.org

September 15, 1998

Laura Holgate, Director
Office of Fissile Materials Disposition
US Department of Energy
PO Box 23786
Washington, DC 20026-3786

Ms Holgate:

Thank you for this opportunity to comment on the Surplus Plutonium Draft Environmental Impact Statement (EIS) of the U.S. Department of Energy. These comments are supplemental to comments already submitted by me on behalf of Nuclear Information and Resource Service in North Augusta, SC in August (provided again below to insure their inclusion in the record).

We remain unalterably opposed to the use of plutonium fuel in reactors, here in the US, in Russia, Canada, anywhere. 1

I take this opportunity to formally protest the fact that a major federal action is being undertaken without providing side by side parallel levels of information on the various options. Plutonium disposition via immobilization only should be compared to a specific analysis of the dual track putting MOX in an existing light water reactor (LWR) and immobilization. It seems the Department of Energy (DOE) is already completely committed to following the dual track MOX option prior to the issuance of the Record of Decision (ROD) on this EIS (which is ostensibly to inform that decision) and prior to any substantive analysis of the impacts that the MOX option would have on specific existing reactors. 2

The evidence for this is DOE's issuance of a Request for Proposal from MOX fabricators and irradiators (reactors) and the intention to forge a contract on MOX work, possibly before the ROD is out.

It would seem that communities around the DOE sites under consideration for plutonium processing and MOX fuel fabrication can look for protection under the National Environmental Policy Act, but those who will be directly affected by the introduction of experimental, never-been-tried-before fuel in the local nuclear power reactor. This is not acceptable. (European MOX does not have gallium added, not is it pure Pu-239.) 3

It is also not acceptable the on three separate occasions members of your Office staff have offered to me the advice that reactor communities can impact the federal decision-

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FD328–1 **Alternatives**

DOE acknowledges the commentor's opposition to the MOX approach. Currently, there is no domestic or international consensus on a single approach to be employed to dispose of surplus plutonium. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

FD328–2 **General SPD EIS and NEPA Process**

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for proposed surplus plutonium disposition facilities. DOE has not precluded any alternative, including immobilizing all the surplus plutonium or taking no action. A side-by-side comparison of the various alternatives are shown in Table 2–4, which summarizes the environmental impacts for all of the alternatives on an individual basis by DOE candidate site.

The SPD Final EIS was not issued until the proposed reactors had been identified and the public had an opportunity to comment on the reactor-specific information. As part of the procurement process, bidders were asked to provide environmental information to support their proposals. This information was analyzed in an Environmental Critique prepared for the DOE source selection board prior to award of the MOX fuel fabrication and irradiation services contract. DOE then prepared an Environmental Synopsis on the basis of the Environmental Critique, which was released to the public as Appendix P of the *Supplement to the SPD Draft EIS* in April 1999. This *Supplement* included a description of the affected environment around the three proposed reactor sites, and analyses of the potential environmental impacts of operating these reactors using MOX fuel (Sections 3.7 and 4.28 of this SPD EIS, respectively). During the 45-day period for public comment on the *Supplement*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. Responses to those comments are provided in Volume III, Chapter 4. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD. As stipulated in DOE's phased contract with DCS, until and depending on the decisions regarding facility siting and approach to surplus plutonium disposition are made and announced in the ROD, no substantive design work or construction can be started by DCS on the MOX facility. Should DOE decide to pursue the No Action Alternative or the immobilization-only approach, the contract with DCS would end. The contract is phased so that only nonsite-specific base contract studies and plans can be completed before the ROD is issued, and options that would allow construction and other work would be exercised by DOE if, and only if, the decision is made to pursue the MOX approach.

FD328–3 **General SPD EIS and NEPA Process**

Irradiation of MOX fuel in reactors is a well–established technology with commercial application in several countries. Because MOX fuel derived from weapons–usable plutonium has not been produced on a commercial scale, DOE has conducted experiments in a test reactor to obtain detailed engineering performance information. It will also conduct a lead assembly project to ensure the availability of all information (including safety parameters) necessary to obtain a license modification for the irradiation of this specific type of MOX fuel.

As discussed in response FD328–2, the public was provided an opportunity to comment on reactor- specific information. In addition, an opportunity for public comment will likely be provided by NRC during DCS's application for making process by intervention in the Nuclear Regulatory Commission's (NRC) license amendment process for any reactor that may use MOX fuel.

This is completely inappropriate. It is almost like saying – the automobile manufacturer doesn't have to bother with any safety analysis or tests of a completely new design of an automobile – just go ahead and build it and sell it and then we will see what happens with the local license inspection. Your office, the Secretary of Energy and the President and Vice President have the responsibility to make a decision based on information about all of the impacts that a MOX program may have. The current document is completely lacking in any consideration of the reactor impacts. 3

In a recent conversation with members of your staff, I was referred to the Programmatic Environmental Impact Statement (PEIS) on Plutonium Disposition when I raised issues associated with the use of aging power reactors for this challenging mission. A return to this document yields the comments I offer below. By the way, they left the existing civilian reactor so-called "low-level" waste out of the PEIS, no matter what the NEPA officer says! 4

I do however, want to assure you that the reactor communities across the country are well aware of their right to intervene on the license amendment process. I also want to point out that even in areas where the community is not what might be called "anti-nuclear," there is already official and documented willingness to oppose use of weapons plutonium in existing reactors. We recommend that you add this information to the uncertainty factor on any cost estimates you make for this program. 3

I would also commend to you the fact that novel procedures such as using environmental reports previously filed with the NRC that may be decades old or the invocation of "proprietary information" under a vendor procurement deal which may require that a local community has to "take DOE's word for it" will not build DOE credibility. In fact, such an approach by your office may also provide procedural loopholes that could result in administrative or legal delays. 5

We sincerely hope that your office retains and pursues its stated high level of commitment to the non-MOX options for plutonium disposition, since there is wide consensus that this disposition should proceed. 1

FOR CONSIDERATION UNDER A TRUE NEPA PROCESS:

Utilization of the environment reports filed at the time of reactor licensing may be decades out of date. What are the plans to upgrade and update this information? 6

Given the aging of nuclear reactors—including embrittlement of major components that has caused multiple reactor shut downs (permanent) well in advance of license expiration (Trojan, Yankee Rowe, Big Rock, Oyster Creek (soon), Maine Yankee to name a few in the last 5 years), combined with the environment of utility restructuring and competition 7

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the reactor operating license amendments required for each individual reactor before it can use MOX fuel pursuant to 10 CFR 50.91 should the MOX approach be selected.

FD328–4 **Waste Management**

Section 3.7 was added and Section 4.28 was revised to include information specific to operating Catawba, McGuire, and North Anna, the reactors that would use the MOX fuel.

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

FD328–5 **General SPD EIS and NEPA Process**

In analyzing the reactors proposed to use MOX fuel, DOE has not relied on information from the original environmental reports filed with NRC. Furthermore, DOE has withheld no information regarding reactor-specific safety analyses conducted for this SPD EIS. Those analyses are discussed in Section 4.28.2.5.

FD328–6 **MOX Approach**

The data used in the SPD EIS analyses of the reactors that would use the MOX fuel were provided by DCS and independently reviewed and verified by DOE. In addition, some information was supplemented by DOE, as discussed in Section 4.28.

The remainder of this comment is addressed in response FD328–5.

FD328–7 **MOX Approach**

The MOX approach is not intended to affect the viability of nuclear power generation at any particular reactor. The reactor owner(s) does (do) not have to continue to use MOX fuel if it determines that it is uneconomical to operate among electrical service providers, it is plausible (even likely) that tax-dollars for the service of plutonium irradiation will keep reactors on-line that would other-wise close.

THEREFORE, a true NEPA analysis of the existing reactor MOX option MUST include the shut-down scenario. It is not only a comparison between LEU (scenario: reactor continues to operate on LEU but all surplus plutonium is immobilized) and MOX (scenario: plutonium fuel is loaded in x many specified existing-LWRs and they get costs plus some financial benefits). It must go one step further: LEU vs MOX vs no reactor (scenario: all plutonium is immobilized and the reactor closes due to market forces). 7

In any economic analysis running parallel to the NEPA analysis, there must be a consideration of the impact of federal tax-dollar protectionism of these reactors on the utility markets that they are part of. What are the long-term environmental consequences of privileging nuclear over bio-mass, wind, solar, small hydro and energy efficiency? 8

If we assume that there will be full-core MOX, which is widely assumed by the industry, and we assume a fast thru-put rate, which will be required if predictions hold on the relatively small number of reactors that will remain viable through the entire program, then the MOX program will have extensive impact on the on-site storage of irradiated fuel. The requirement of ten years wet storage for irradiated MOX will certainly force accelerated movement of LEU fuel into dry storage. Once MOX fuel is being put in dry storage, the requirement of relatively few assemblies per container will expand the overall total number of dry casks required. 9

This NEPA analysis should consider how to factor any local or state requirements and restrictions applied to on-reactor-site interim storage. For instance, the Minnesota Supreme Court ruled that cask storage is different than pool storage and is subject to State Legislature approval. Nevada has outlawed storage and Vermont and California also have restrictions in place, to name a few. There has yet to be the constitutional test over the ability of the federal programs to override state law on behalf of nuclear enterprises. This should not be forgotten.

Does DOE intend to start exerting "National Security" type arguments over civilian facilities and the communities and States that host them? If so, we had best know that now, and Governors should be advised as well. Again, it is completely unsupportable that these decisions are being made with a systematic exclusion of the reactor impacts analysis at any level where it can inform this decision, and without the active inclusion of the reactor communities. 3

USE OF A GENERIC REACTOR AS PROXY FOR SITE SPECIFIC ANALYSIS

There is no such thing as a generic nuclear power reactor. Each was built in a unique place, as a unique fabrication, and many on effectively unique designs. Over the years they have become MORE unique, as can be demonstrated by the very high percentage that are now out of compliance with their own Final Safety Analysis Report and Design 10

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the reactor. If a reactor withdraws from the team, DCS must accommodate the loss of capacity. The actions to accommodate might include changing MOX fuel loadings in the remaining reactors and finding a replacement reactor. This ensures that DOE is not driving the continuation of reactor operations solely for the surplus plutonium disposition program. Furthermore, DCS would only be reimbursed for costs that are solely and exclusively related to MOX fuel irradiation. This would ensure that the taxpayers were not underwriting otherwise uneconomical electricity-generating assets.

The purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program. If DOE were to choose the immobilization-only approach, these reactors are expected to continue to operate using LEU fuel for at least as long as it would otherwise take to complete the irradiation of the MOX fuel. So, while this SPD EIS does consider the immobilization-only approach (Alternatives 11 and 12) advocated by the commentor, it does not analyze the environmental impacts associated with shutting down the specific reactors proposed to use MOX fuel before the end of their useful life because DOE did not choose to use MOX fuel in those reactors.

FD328–8 **Cost Report**

Because this comment relates directly to the cost analysis report, it has been forwarded to the cost analysis team for consideration. The *Plutonium Disposition Life–Cycle Costs and Cost–Related Comment Resolution Document* (DOE/MD–0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS and Washington, D.C. Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this

Bases documents. It is not at all credible to suggest that the generic analysis provided (such as it is) in the PEIS can stand for a reactor impacts analysis.
Some reactor items which are NOT generic:

Reactor design
Reactor modifications, historic and needed for MOX use
Reactor vessel chemistry
Reactor vessel and internal component aging
Irradiated Fuel storage—wet and dry status, physical, social, political
Fuel storage siting issues and authorities
So-called "Low-Level" waste disposal factors, handling, on-site issues
Transport factors
Population
Emergency planning
History of management/regulatory issues including safety factors and performance
History of emissions
Degree of extant contamination and radiological impact on humans/environment 10

This is not the complete list.

The PEIS references Appendix E for information about the waste associated with the existing-LWR MOX option. Nowhere in Appendix E is the existing-LWR option listed. There is a very cursory discussion of so-called low-level (civilian LLRW includes plutonium even in class A waste, and reactor "low-level waste" may also include sludges from primary coolant and components such as steam generators and the reactor vessel as well as reactor internals that will deliver a lethal dose if unshielded) waste, associated with the Evolutionary LWR scenario There is no section on the existing-LWR option in Appendix E. 11

References to reactor-site burial of such waste certainly require a site-specific analysis, not a generic dismissal. Disposal off site is simply given as the other option; end of analysis. There is no documentation of the array of radionuclides in so-called low-level radioactive waste (LLRW) that would result from irradiation of MOX fuel vs LEU fuel. There is no consideration of the environmental impacts of shipment to or emplacement of this MOX LLRW in any of the existing "low-level" unlined trench dump sites: Barnwell in South Carolina near SRS, Envirocare in Utah or Richland in Washington State next to Hanford.

Needless to say, there is no analysis of the potential impacts of this plutonium fuel generated waste in any of the proposed new "low-level" dumps – of greatest interest being Ward Valley in California and Sierra Blanca in Texas because of the ongoing debates about whether these facilities may jeopardize major water supplied in the Colorado and Rio Grande rivers. 12

Another area of nuclear infrastructure completely ignored by the PEIS are all the nuclear services that reactor operators require. These include: nuclear laundries, incineration and 13

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proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The comparison of the environmental impacts of nuclear power with those of alternative energy sources is beyond the scope of this EIS.

FD328–9 **MOX Approach**

As discussed in Section 4.28, a partial, not full, MOX core is proposed. After irradiation, the MOX fuel would be removed from the reactor and managed with the rest of the spent fuel from the reactor, eventually being disposed of at a potential geologic repository built in accordance with the NWPA, as amended. As described in response FD328–4, additional spent fuel would be produced, but in amounts that are not expected to dramatically change the reactors' spent fuel storage plans (e.g., no new cooling ponds would be required at the proposed reactor sites). State requirements applicable to the reactors' spent fuel storage plans would be considered during the NRC operating license amendment process pursuant to 10 CFR 50.90.

FD328–10 **MOX Approach**

Reactor-specific analyses are presented in the revised Section 4.28 and replaced the generic reactor analysis presented in the SPD Draft EIS.

FD328–11 **Waste Management**

The estimated waste generation associated with the proposed reactors is discussed in Sections 3.7 and 4.28 of this SPD EIS.

FD328–12 **Waste Management**

None of the proposed reactors plan to bury LLW on the site. LLW would continue to be disposed of at offsite commercial facilities licensed by NRC. There are differences in fission product inventories and activation products between an LEU and MOX core during a fuel cycle. The only time significant quantities of fission products could be released to the environment would be in the event of a large–scale fuel leak. In regard to normal operations, FRAGEMA's (a subsidiary of COGEMA; one of the companies chosen to operate the proposed MOX facility) experience with fabricating MOX fuel indicates a leakage rate of less than one-tenth of 1 percent. FRAGEMA alone has provided 1,253 MOX fuel assemblies, with more than 300,000 fuel rods for commercial reactor use. There have been no failures and leaks have occurred in only 3 assemblies (a total of 4 rods). All leaks occurred as a result of debris in the reactor coolant system and occurred in 1997 or earlier. The French requirements for debris removal were changed in 1997 to alleviate these concerns. Since that time, there have been no leaks in MOX fuel rods. In the event of a leaker, fission products are released into the primary containment and are ultimately either passed through a series of resins (for liquid releases) or through a HEPA filtration system (for releases to the atmosphere) that would capture approximately 99.99 percent of the radionuclides.

The use of MOX fuel would not be expected to result in any additional LLW from refuelings because the reactors would continue to operate on the same schedule as if they were using only LEU fuel.

FD328–13 **Human Health Risk**

As indicated in the revised Section 4.28 of this SPD EIS, the use of MOX fuel would not significantly change the reactor effluents or the amounts of spent nuclear fuel and wastes generated. Therefore, wastes and emissions from reactor nuclear services would not appreciably change. As such, any changes in worker and public health risk and other environmental impacts associated with these nuclear services would likely be minor.

compaction facilities for so-called "low-level" waste, decontamination services for components that are not yet considered waste and off-site storage warehouses for all of the above. The question is very real, and as yet unanswered: what does the use of MOX fuel do to the workers, the air and water emissions, and waste streams from each of these nuclear services? How does this impact the environment and public health and safety? 13

Don't the communities that affected by these nuclear service facilities have a right to this information? This information should be factored when considering immobilization only analysis track. The possibility of reactor closures should also be factored in such an analysis: what is the affect on the environment if you just plain phase out these facilities? 3

It is ridiculous that the "criteria pollutants" for air emissions under the PEIS generic reactor analysis does not include radionuclides. No numbers are given for MOX radionuclide emissions vs LEU air emissions. It is well documented the there has been a history of fuel failure in US reactors with LEU fuel. There is evidence that European MOX fuel is more prone to cladding failure, and that Weapons Pu MOX may be even more prone to cladding failure than European MOX. The interaction of gallium and zircaloy and other factors, such as the chemistry of the core are factored into this projected incident rate. A credible analysis of the existing-LWR MOX option will need to quantify this in a reasonable and defensible manner, and include it in the projected air emissions. 14

It should be noted that the generic reactor portrayed by the PEIS is based on data that is already today 6 to 10 years old. This is not going to reflect the aging issues that are coming to the forefront of reactor hazard concerns. The difference in neutron activity associated with MOX fuel also needs to be assessed for the possible contribution to further acceleration of the aging of these components, and the consequent reduction in the margin of safety at the site. 15

Additionally, there needs to be some assessment of the institutional issues. Weapons Pu-239 fuel will be a first-time experiment. What are the human factors that are affected by changing basic features of an aging system? 16

The generic reactor analysis further does not give an assessment of the source term associated with the reactor core, the fuel pool or a dry storage unit. Again, the LEU vs MOX comparison must be made, and should be compared to the shut-down reactor possibility. 7

There is ample evidence to suggest that the use of weapons plutonium MOX in existing aging light water reactors subject to utility deregulation may not only increase the probability of a major reactor accident, but would also increase the effects of such an accident, were it to happen. No where in the NEPA process to date are these issues addressed by DOE. What is the justification for taking a major federal action with such potentially grave consequences, without the least consideration of these factors? 17

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FD328–14 **Air Quality and Noise**

Section 4.28.2.4 indicates the doses from atmospheric and liquid releases that would be expected from the continued operations of the proposed reactors with MOX fuel. A plutonium-polishing process was added as a component of the MOX facility to address concerns about the presence of gallium and other impurities in the MOX fuel. Therefore, it is not expected that the MOX fuel would be more prone to cladding failure than LEU fuel.

FD328–15 **MOX Approach**

Section 4.28 of this SPD EIS was revised to provide current reactor-specific analyses and discuss the potential environmental impacts of using a partial MOX core during routine operations and reactor accidents. The higher flux associated with MOX fuel can accelerate reactor component aging. However, this would be taken into account when developing fuel management strategy, including fuel assembly placement in the reactor core. Safety issues would also be addressed during the NRC license amendment process.

FD328–16 **MOX Approach**

Some procedural modifications relating to fresh fuel handling, reactivity control, and spent fuel management may be required for the reactors using MOX fuel. None of these modifications would be expected to result in increased environmental impacts from the continued normal operation of these reactors. These changes would likely be covered in an ongoing training program for operators and would be discussed during the NRC license amendment process.

FD328–17 **Facility Accidents**

As discussed in Section 4.28.2.5, studies by NAS have led it to the following conclusion: "no important overall adverse impact of MOX use on the accident probabilities of the LWRs involved will occur; if there are adequate reactivity and thermal margins in the fuel, as licensing review should ensure, the main remaining determinants of accident probabilities will involve factors not related to fuel composition and hence unaffected by the use of MOX rather than LEU fuel." Section 4.28 was revised to include an analysis of the potential accidents and risks associated with using MOX fuel in the proposed reactors.

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Finally, there is no justification whatsoever for taking the recommendation for a linear no-threshold model for radiation dose response from the BIER-V report and then applying an arbitrary risk reduction factor to it. Indeed, real-world health studies done by credible scientists are showing a supra-linear dose-response curve, where per-unit of dose there are more health consequences in the low-dose range. 18

All taken together, we recommend that the current EIS be suspended and a design phase for this NEPA process be initiated so that there is no decision on the MOX option until these, and other concerns that may be raised by concerned citizens are addressed. 2

Thank you for your consideration,

Mary Olson
NIX MOX Campaign Coordinator
Nuclear Information & Resource Service

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The SPD Final EIS was not issued until the proposed reactors had been identified and the public had an opportunity to comment on the reactor-specific information. As part of the procurement process, bidders were asked to provide environmental information to support their proposals. This information was analyzed in an Environmental Critique prepared for the DOE source selection board prior to award of the MOX fuel fabrication and irradiation services contract. DOE then prepared an Environmental Synopsis on the basis of the Environmental Critique, which was released to the public as Appendix P of the *Supplement to the SPD Draft EIS* in April 1999. This *Supplement* included a description of the affected environment around the three proposed reactor sites, and analyses of the potential environmental impacts of operating these reactors using MOX fuel (Sections 3.7 and 4.28 of this SPD EIS, respectively). During the 45-day period for public comment on the *Supplement*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. Responses to those comments are provided in Volume III, Chapter 4.

FD328–18 **Human Health Risk**

As indicated by the commentor, the estimates of adverse health effects from radiation doses for this SPD EIS are based on the linear, no-threshold theory of radiation carcinogenesis, including the application of a dose-rate effectiveness factor (risk reduction factor). The no-threshold model postulates that all radiation doses, even those close to zero, are harmful. The approach used in this EIS, including the application of a dose-rate effectiveness factor of 2 is consistent with the recommendations made by the Committee on Interagency Radiation Research and Policy Coordination (*Use of BEIR V and UNSCEAR 1988 in Radiation Risk Assessment, Science Panel Report, No. 9*, ORAU 92/f-64, December 1992). However, it is generally acknowledged that the model results in conservative predictions of adverse health effects.

NIRS

Nuclear Information and Resource Service

1424 16th St. NW, Suite 404, Washington, DC 20036; 202-328-0002; fax:202-462-2183; e-mail:nirsnet@igc.apc.org web:www.nirs.org

Thank you for this opportunity to comment on the Surplus Plutonium Draft Environmental Impact Statement of the U.S. Department of Energy, North Augusta, SC, August 13, 1998

Mary Olson
NIX MOX Campaign Coordinator
Nuclear Information & Resource Service

On behalf of the nationwide membership of Nuclear Information and Resource Service, I am here to respectfully tell you to put zero plutonium into MOX (mixed plutonium and uranium oxide) fuel. Our organization was founded by communities that are affected by commercial nuclear power reactors. 1 Over time our members have grown to include those who are affected by current and proposed nuclear waste sites and transport routes. We are offended that the Department of Energy has persisted in ignoring these communities that will be directly affected if MOX fuel is produced and introduced into the fuel stream and so inevitably the waste stream of the nation's reactors. Your process has selectively targeted comments from the communities that would be affected by MOX fuel fabrication, but not it's use. 2

We oppose the use of plutonium fuel, therefore we oppose the fabrication of plutonium fuel. We encourage DOE to fully explore the non-reactor alternatives for plutonium disposition. 3

I am here to tell you will hear from the reactor communities. You have done little to reach these communities, but when the news arrives that plutonium is on the way, you will hear the cry loud and clear: NIX MOX. 4 Communities simply will not settle for a plan that both increases the possibility of a major reactor accident occurring AND also guarantees that if there is a major release of radiation that the consequences of that accident will be greater than if there were LEU uranium as the reactors were designed for. Communities with aging reactors are taking the safety issues into their own hands and 9 reactors in as many years have closed due to a combination of safety and economic concern. MOX will simply become one more opportunity for those concerned about nuclear hazards at reactors to make their case. 5

Nationally this program will not stand the scrutiny of the electric utility deregulation process. Direct taxpayer subsidy unfairly advantages nuclear power 6

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SCD28–1 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach to surplus plutonium disposition. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

SCD28–2 **General SPD EIS and NEPA Process**

At the time the SPD Draft EIS was issued for comment, no domestic, commercial reactors had been identified for the possible irradiation of MOX fuel.

The SPD Final EIS was not issued until the proposed reactors had been identified and the public had an opportunity to comment on the reactor-specific information. As part of the procurement process, bidders were asked to provide environmental information to support their proposals. This information was analyzed in an Environmental Critique prepared for the DOE source selection board prior to award of the MOX fuel fabrication and irradiation services contract. DOE then prepared an Environmental Synopsis on the basis of the Environmental Critique, which was released to the public as Appendix P of the *Supplement to the SPD Draft EIS* in April 1999. This *Supplement* included a description of the affected environment around the three proposed reactor sites, and analyses of the potential environmental impacts of operating these reactors using MOX fuel (Sections 3.7 and 4.28 of this SPD EIS, respectively). During the 45-day period for public comment on the *Supplement*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. Responses to those comments are provided in Volume III, Chapter 4.

SCD28–3 **MOX Approach**

DOE acknowledges the commentor's support for the immobilization-only approach. DOE considers the use of a nonreactor alternative in Alternatives 11 and 12, immobilization of all the surplus plutonium.

SCD28–4 **MOX Approach**

This comment is addressed in response SCD28–2.

SCD28–5 **Facility Accidents**

Section 4.28 was revised to provide reactor-specific analyses and discuss the potential environmental impacts of using a partial MOX core during routine operations and reactor accidents. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

SCD28–6 **MOX Approach**

Use of MOX fuel in commercial reactors is not proposed in order to subsidize the commercial nuclear power industry in the event of deregulation. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

reactors over other forms of electricity. Ultimately, when the consumer decides, DOE may have to pay a lot to keep MOX reactors on line. 6

When it comes to transportation, MOX will necessarily involve more transportation steps than any other alternative. Our experience is that communities are extremely unhappy to hear about nuclear shipments on their roads and rails. The Department's own research has shown that this opposition runs very deep. More than 20 % of those queried (in a social science survey done by the University of New Mexico for DOE) said that they thought that civil disobedience (breaking laws) was justified to stop nuclear shipments through heir town, and 80% said that they would vote against any elected official who supported such a plan, as well as give money to groups that would help fight it. People feel very strongly about this, perhaps Vice President Gore should listen! 7

One of the most disturbing aspects of the DEIS that we are here to comment on, aside from the obvious commitment to taking the MOX option, is the plan to ship plutonium in the powder or oxide form. We would oppose this idea if it were just a few miles, but the current consideration of shipping it across 6 states is ridiculous. Not only is it a enormous security risk, if there were some form of catastrophic disruption of such a shipment, the containment of the plutonium oxide would present a much greater challenge than other forms of the material. The potential dispersal by air (wind or fire plume) or run-off would place countless human generations at greater risk of cancer, birth defects and other health problems, as well as affecting other species adversely. We firmly believe that the U.S. DOE has no right whatsoever to take risks, the consequences of which could result in nuclear devastation, particularly in the name of reducing nuclear dangers. 8

We are further alarmed to realize that recent changes in Nuclear Regulatory Commission requirements for plutonium shipping containers no longer require a double walled vessel. DOE should not ship plutonium oxide in bulk at all and any other type of plutonium shipment, the Department should voluntarily use a double (or more) walled container. What is the excuse for increasing risk? This is an inherently hazardous activity, which long term consequences. 9

There would be many advantages to the plutonium disposition mission if the MOX program were canceled. Here is a brief overview along with our recommendations for how to proceed with a successful disposition for this plutonium which we all agree is far better removed from the weapons inventory.

Plutonium "polishing" would be minimal for most immobilization methods. An aqueous "pre-processing" step, much like the reprocessing step that separated the plutonium in the first place could be avoided. Reprocessing is known to produce some of the most dangerous and difficult to contain wastes in the history of the nuclear age. There is no reason for the DOE to compound this disaster as 10

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SCD28–7 **Transportation**

DOE acknowledges the commentor's concern about public reaction to the transportation of nuclear material. The hybrid alternatives in this SPD EIS would require more transportation than the immobilization-only alternatives as shown in Section 2.18 and Appendix L.

SCD28–8 **Transportation**

Table L-6 summarizes the analysis of risks attributed to alternatives that involve transportation of nuclear materials. The Type B packages that would be used to transport radioactive material are designed to withstand test conditions described in Appendix L.3.1.6, which represent extremely severe accidents (estimated to be more severe than over 99 percent of all accidents that could occur). Type B packages have been used for years to ship radioactive materials in the United States and around the world. To date, no Type B package has ever been punctured or has had its contents released, even in actual highway accidents. As described in Appendix L.3.1.6, the Type B package is extremely robust and provides a high degree of confidence that even in extremely severe accidents, the integrity of the package would be maintained with essentially no loss of the radioactive contents or serious impairment of the shielding capability. As discussed in Section 2.18, no traffic fatalities from nonradiological accidents or LCFs from radiological exposures or vehicle emissions are expected. DOE's decision will be based on analysis in this SPD EIS and will include consideration of public comments.

SCD28–9 **Transportation**

Appendix L contains information on the shipping containers that would be used to transport plutonium. Transportation of the plutonium material would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material. Under NRC regulations (10 CFR 71), plutonium in excess of 20 Ci per package must be packaged in a separate inner container placed within an outer container (i.e., double-walled system). This requirement would apply to DOE shipments of surplus plutonium.

SCD28–10 **Alternatives**

DOE is not considering reprocessing any surplus plutonium from spent nuclear fuel; plutonium polishing is not reprocessing and would be a relatively small component of the MOX facility. As described in the Waste Management sections in Chapter 4 of Volume I, the wastes generated would not have a major impact on waste management resources at any of the candidate sites. If Pantex were chosen as the site for any of the proposed surplus plutonium disposition facilities, additional LLW and TRU waste capabilities may be required, as discussed in the appropriate sections in Chapter 4 and Appendix H.3. DOE also appreciates the commentor's concern regarding environmental consequences of surplus plutonium disposition activities. As described in Chapter 4 and summarized in Section 2.18, potential impacts to the public from any of the proposed activities during routine operations at any of the candidate sites would likely be minor. To avoid contamination that has occurred in the past at some DOE sites, DOE would design, build, and operate the proposed in compliance with today's environmental, safety, and health requirements.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons–Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site–specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life–Cycle Costs and Cost–Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life–cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe–md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington D.C.

Commercial reactors currently have armed security forces, primarily to protect against perimeter intrusion. There would be increased security for the receipt and storage of fresh MOX fuel, as compared with that for fresh LEU fuel, for additional vigilance inside the perimeter. However, the increased security surveillance would be a small increment to the plant's existing security plan.

The remainder of this comment is addressed in responses SCD28–7, SCD28–8, and SCD28–9.

is already evident in the environmental devastation of nuclear pollution here at and around Savannah River Site and the Hanford Reservation.

Fewer facilities would have to be built, reducing the coat as well as the inevitable difficulty associated with approvals, licenses and such.

Plutonium would travel less. Nuclear Information and Resource Service is not taking a position on where the immobilization program should be pursued, or even if it should be done in one place. Nonetheless, it is pretty obvious that weapons-usable material would be transported less and spend more time within the boundaries of the DOE complex than in the MOX option. Before it is fissioned in the reactor core MOX fuel is still weapon's usable, requiring only reprocessing technology, not enrichment. Thus it would require national security level security in transport. 10

Further, there would have to be the same level of security instituted at reactor sites. We object to DOE endowing private security services in our communities with a shoot-to-kill authority.

Obtaining reactor license amendments for this new fuel type will offer the opportunity to review the reactor safety systems and also t he aging issues inherent in the long-term exposure to he heat and radiation of LEU uranium fuel. The increased capacity of plutonium fuel to age components, particularly in the full-MOX cores that the Department seems to be assuming in the DEIS, will provide a wonderful opportunity to target reactors for early closure. 11

On the waste front, immobilization also offers the Department some relief, since the storage of an immobilization end-product can be designed from the ground-up to be appropriate for this new waste type. In contrast, irradiated MOX fuel in the hands of nuclear utilities that are already facing challenges of waste storage is a very different picture. Over-filled fuel pools, many already strained far beyond their original design capacity will not be easier to manage with the greater thermal and criticality factors, as well as cladding stress issues that MOX will introduce. If dry storage is in use at the time that MOX waste would be moving out of the fuel pools, attempted use of current cask designs may also result in problems that will be the Department's to deal with at some point. What is going to become of all that damaged fuel if we ever do have a repository? 12

All this spells more expense, more regulatory and administrative combat with local communities and ultimately if great care is not take and more money is not spent, far greater environmental impact than a system that is designed specifically for the unique aspects of plutonium wastes.

The list of all the reasons MOX is a bad idea goes on, and we will supplement these oral comments with further written comments. The bottom line is that MOX will cost a tremendous amount of money to do at all, and then it will cost even

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SCD28

SCD28–11 **NRC Licensing**

The higher flux associated with MOX fuel can accelerate reactor component aging. However, this is taken into account when developing fuel management strategy, including fuel assembly placement in the reactor core. The proposed action anticipates partial, not full, MOX cores in the selected reactors. This issue, along with other issues important to safety, would be addressed during the NRC license amendment process.

SCD28–12 **Waste Management**

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository. MOX fuel would be handled the same as other fuels with regard to pools and dry casks. MOX fuel assemblies would be the same size and shape as the LEU fuel for the specific reactor. The only difference would be the additional decay heat from the higher actinides, especially americium, in the MOX fuel. Dry casks are designed and certified for a maximum heat load, so the additional decay heat would contribute to the total heat load and not require any redesign. The additional heat load may result in less spent fuel stored per cask. A more likely option is that the MOX fuel would be selectively packaged with cooler LEU fuel to obviate any overall heat output restriction. As a result, DOE does not expect any changes in the cask design. An amendment to the Certificate of Compliance for the cask, and the reactor operating license, would be needed to include storage of MOX fuel assemblies.

The remainder of this comment about cost is addressed in response SCD28–10.

NUCLEAR INFORMATION AND RESOURCE SERVICE
MARY OLSON
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more to deal with the legal and administrative aspects of trying to oppose the people you serve, and then it will cost even more than that, since the probability of a real problem at some point are not our imagination, but rather based on 50 years of experience with the Department and three decades of suffering reactor operation. 12

Recommendations for responsible immobilization of surplus weapons plutonium.

The Department must insure a zero release policy for every site where plutonium is handled. There is no acceptable amount of this material in the environment, in our bodies, in our food, in our air in our water.

This means that there has to be a plan for ALL the waste at every step to insure that it is tracked into 100% containment, and that there is no idea that it is OK to vent.

The Department should insure that state of the art monitoring will instituted -- with redundancy to insure that this policy is in-force at all times. One of the monitoring systems should be administered completely in the control of the local community. 13

This means that there is a commitment to zero dose to the public in this process.

The Department should institute a low as achievable dose policy for workers. This is NOT ALARA -- remove the word "reasonably" before achievable. Cancel MOX and spend the money you would save on meeting these goals, and there will be far greater acceptance of plutonium disposition mission in whatever community you approach to host this vital contribution to the welfare of our planet.

Equally Important to protecting the people and the environment from DOE's plutonium handling is the security of this vulnerable material. We recognize that steps must be taken to insure that this material is not diverted. At the same time this must not be at the expense of an open and accessible information base to insure that environment and safety commitments are being met. 14

Thank you.

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SCD28

SCD28–13 **DOE Policy**

The health and safety of workers and the public is a priority of the surplus plutonium disposition program, regardless of which approach is chosen. Operation of the proposed surplus plutonium disposition facilities would comply with applicable Federal, State, and local laws and regulations governing radiological and hazardous chemical releases. Within these limits, DOE believes that the level of contamination should be kept as low as is reasonably achievable, so that the benefit of reducing the already low level of contamination would warrant the additional cost of that reduction. Chapter 5 summarizes the applicable environmental statutes, regulations, and permits that cover emissions, waste, and ALARA standards.

SCD28–14 **DOE Policy**

DOE acknowledges the commentor's concern about the security of plutonium materials. The proposed DOE surplus plutonium disposition facilities are all at locations where plutonium would have the levels of protection and control required by applicable DOE safeguards and security directives. Safeguards and security programs would be integrated programs of physical protection, information security, nuclear material control and accountability, and personnel assurance. Security for the proposed facilities would be implemented commensurate with the usability of the material in a nuclear weapon or improvised nuclear device. Physical barriers; access control systems; detection and alarm systems; procedures, including the two-person rule (which requires at least two people to be present when working with special nuclear materials in the facility); and personnel security measures, including security clearance investigations and access authorization levels, would be used to ensure that special nuclear materials stored and processed inside are adequately protected. Closed-circuit television, intrusion detection, motion detection, and other automated materials monitoring methods would be employed. Furthermore, the physical protection, safeguards, and security for the MOX facility and domestic, commercial reactors would be in compliance with NRC regulations. International inspections of the proposed facilities would be conducted strictly by procedure so as not to compromise security. None of the policies, programs, or procedures implemented for safeguarding this material would inhibit compliance with safety or environmental regulations.

Sept 10, 1998

U.S DOE, Office of Fissile Material Disposition: 1952 Palisades Dr.
Comment on SPD EIS (DOE/EIS-0283-D) Appleton, WI 54915

I am pleased to see this effort with Russia to reduce the threat of nuclear proliferation. I certainly hope an agreement on this is being made. We need to set an international example in this "gift of time" we now have. 1

I strongly advocate immobilizing all of the surplus plutonium and not using any of it as MOX in commercial reactors. I think your SPD EIS does not deal with what is "really happening" with spent fuel at commercial reactors and paints a rosy picture of mox fuel being tested by lead assemblies, and NRC approved, and everything going fine. If you look at what has happened with spent fuel at commercial reactors in relation to the VSC-24 and Nuhoms dry cask storage in the past 10 years, it is very clear that commercial vendors and commercial utilities (as licensees) have been very lax in the way things were handled — and the NRC had its share of mistakes too. There were so many nonconformances and violations and fines given out, that in the end Vectra and Sierra Nuclear both were on the verge of bankruptcy and not allowed to fabricate casks — which means reactors were stuck with full fuel pools and no casks to load spent fuel into. The explosion of a VSC-24 at our Pt. Beach reactor was a real black eye to the whole system — vendors, utilities, and the NRC. Now you ask us to put MOX fuel in their hands? I think not. We have enough problems already. 2

Commercial reactors are aging; steam generators are corroding, brittleness is a problem, pools are aging, more and more safety factors are coming to light. Now

MD178

MD178–1 **Nonproliferation**

The United States and Russia recently made progress in the management and disposition of plutonium. In late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile. The United States does not currently plan to implement a unilateral program; however, it will retain the option to begin certain surplus plutonium disposition activities in order to encourage the Russians and set an international example.

MD178–2 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach and support of the immobilization approach. In choosing reactors to use the MOX fuel, DOE looked at the criteria of reactor age. DOE chose only reactors whose planned operating life extended through the full life cycle of the surplus plutonium disposition program. Section 4.28 was revised to discuss the potential environmental impacts of operating Catawba, McGuire, and North Anna, the reactors that would use the MOX fuel. The spent fuel generated from the use of the MOX fuel in the commercial reactors would be stored at the reactors in accordance with all applicable NRC regulations and shipped to and disposed of at a potential geologic repository as would other commercial reactor spent fuel. Transportation of commercial spent fuel to a potential geologic repository is analyzed in the *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999). As far as reactor modifications and liability, the commercial reactor licensee is responsible to maintain and modify the reactor as needed.

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is no time to put more stress on the public system by promoting the use of military waste in commercial reactors. The military and public were always to be separate on this. If you mix this now, it will only lead to future troubles. I see it as a cheap bailout for the nuclear industry which is facing huge problems and costs with dry cask storage and decommissioning woes. They'd love to get some cheap MOX fuel and have DOE (the public as tax payers) liable for any problems. Once this MOX is spent fuel, then what??? Will DOE pay for dry casks for it and be responsible? If reactors need changes, or fuel handling at reactor pools require changes, or casks need design changes, is DOE responsible for costs and liabilities or what? You have to look at the details here. The public could get saddled with a huge bill. Let the commercial reactors pay for their own fuel, and be responsible for their own problems. Don't get the military and DOE interwoven in utility spent fuel problems. It will be a mess! 2

Questions:

1. If Yucca Mt does not open, will DOE be responsible for MOX in dry cask storage at reactors? Who pays for problems? 3
2. If Yucca Mt. does open, will MOX spent fuel take priority ahead of other commercial spent fuel + go in first? How will other commercial reactors feel about this? 4
3. The capacity of Yucca is too small for total waste now, when will other repositories be sited? How many will we need, if MOX fuel promotes relicensing of aging plants so that they run longer on this cheap subsidy? We should be closing these plants now, not 5

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Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

MD178–3 **Repositories**

This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository. The characteristics of the MOX spent fuel would be similar to those of normal spent LEU fuel. As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository. Following irradiation, the MOX fuel would be removed from the reactor and managed at the reactor site as spent fuel in accordance with the site's normal spent-fuel-handling procedures. Reactors would require NRC operating license amendments and, as part of that process, safety and operational arrangements (e.g., spent fuel management plans) would be evaluated. In any event, it would be the licensee's responsibility to ensure that spent fuels, MOX or LEU, were safely managed.

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pouring more money down the commercial nuclear drain. This country is ready for renewables and not longer run nuclear plants creating waste that has no place to go. 5

4. Will MOX spent fuel fit into already generically certified dry cask designs, or will there be big problems with changes necessary? Will amendments to certificates by rulemaking be needed? 6

5. Can cask vendors supply casks for all the spent fuel needs in the next years? There are only a few vendors and they have huge problems. Who is going to supply casks for all this MOX spent fuel? How does it fit in the system? Will commercial reactors that use MOX go to the head of the list for their waste to go to Yucca? 7

6. If Canada uses MOX in their reactors, who is liable for problems? Where does the spent fuel go? When? How do they fit into priority repository scheduling? 8

7. How will you decide which reactors will use MOX? Are you evaluating which are best suited and their past safety record? You should. What is their history? 9

8. NRC should definitely do a post-irradiation examination inspection of lead MOX assemblies. These tests need to be done before any licensing. We got into a lot of problems because dry casks weren't pretested correctly and casks were built by exemption before certification. Testing needs to be done before use at reactors. Require NRC to do this please. 10

9. DOE should have evaluated FFTF for tritium production before putting this SPD EIS out. If they use the MOX there, you say MOX in commercial reactors would not be "a reasonable cost-effective approach" to 11

MD178

MD178–4 **Repositories**

The order of acceptance of the spent fuel for final disposition in the potential geologic repository would be in accordance with agreements made between DOE and the licensee and in compliance with NEPA.

MD178–5 **Repositories**

This comment is addressed in responses MD178–2 and MD178–3.

MD178–6 **Waste Management**

MOX fuel would be handled the same as other fuels with regard to pools and dry casks. MOX fuel assemblies would be the same size and shape as the LEU fuel for the specific reactor. The only difference would be the additional decay heat from the higher actinides, especially americium, in the MOX fuel. Dry casks are designed and certified for a maximum heat load, so the additional decay heat would contribute to the total heat load and not require any redesign. The additional heat load may result in less spent fuel stored per cask. A more likely option is that the MOX fuel would be selectively packaged with cooler LEU fuel to obviate any overall heat output restriction. As a result, DOE does not expect any changes in the cask design. An amendment to the Certificate of Compliance for the cask, and the reactor operating license, would be needed to include storage of MOX fuel assemblies.

MD178–7 **Waste Management**

DOE acknowledges the commentor's concern that dry cask storage at the reactor sites may be limited by the availability of casks. Little or no additional wet pool or dry cask storage space would be needed for the MOX spent fuel generated at the selected commercial reactor sites. DOE does not expect that MOX spent fuel would get preferential treatment over other reactor spent fuel for disposal in a potential geologic repository.

MD178–8 **Parallex EA**

In the SPD Draft EIS, DOE retained the option to use some of the surplus plutonium as MOX fuel in CANDU reactors, which would have only been undertaken in the event that a multilateral agreement were negotiated among

Russia, Canada, and the United States. Since the Draft was issued, DOE determined that adequate reactor capacity is available in the United States to disposition the portion of the U.S. surplus plutonium that is suitable for MOX fuel and, therefore, while still reserving the CANDU option, DOE is no longer actively pursuing it. However, DOE, in cooperation with Canada and Russia, proposes to participate in a test and demonstration program using U.S. and Russian MOX fuel in a Canadian test reactor. A separate environmental review, the *Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment* (DOE/EA-1216, January 1999), analyzes the fabrication and proposed shipment of MOX fuel rods for research and development activities involving the use of limited amounts of U.S. MOX fuel in a Canadian test reactor. A FONSI was signed on August 13, 1999. Both of these documents can be viewed on the MD Web site at http://www.doe-md.com. If a decision is made to dispose of Russian surplus plutonium in Canadian CANDU reactors in order to augment Russian's disposition capability, shipments of the Russian MOX fuel would take place directly between Russia and Canada.

MD178–9 **NRC Licensing**

As part of the procurement process, bidders were asked to provide environmental information to support their proposals. This information was analyzed in an Environmental Critique prepared for the DOE source selection board prior to award of the MOX fuel fabrication and irradiation services contract. DOE then prepared an Environmental Synopsis on the basis of the Environmental Critique, which was released to the public as Appendix P of the *Supplement to the SPD Draft EIS* in April 1999. This *Supplement* included a description of the affected environment around the three proposed reactor sites, and analyses of the potential environmental impacts of operating these reactors using MOX fuel (Sections 3.7 and 4.28 of this SPD EIS, respectively).

As discussed in Section 4.28.2.5, studies by NAS have led it to the following conclusion: "no important overall adverse impact of MOX use on the accident probabilities of the LWRs involved will occur; if there are adequate reactivity and thermal margins in the fuel, as licensing review should ensure, the main remaining determinants of accident probabilities will involve factors not related to fuel composition and hence unaffected by the use of MOX rather than

LEU fuel." Further, as discussed in the revised Section 4.28, the most recent systematic assessment of licensee performance conducted in 1997 on the reactors selected to irradiate MOX fuel resulted in ratings ranging from good to superior with respect to operations, maintenance, engineering, and plant support.

An NRC reactor operating license amendment will be required for each individual reactor before it can irradiate the MOX fuel. The regulatory process will be the same as for any 10 CFR 50 operating license amendment request in accordance with 10 CFR 50.90. The reactor licensee will initiate the process by submitting an amendment request. Safety and environmental analyses commensurate with the level of potential impact are submitted in support of, and as part of, the amendment to NRC. NRC reviews the submitted information and denies or approves the request.

MD178–10 **Lead Assemblies**

In consultation with DCS, the team selected to fabricate and irradiate the MOX fuel, DOE believes that limited lead assembly fabrication and postirradiation examination would be required. This SPD EIS analyzes the potential environmental impacts of the fabrication of lead assemblies and their postirradiation examination. Domestic, commercial reactors operate under NRC license; therefore, the use of MOX fuel lead assemblies would be subject to review and regulation by NRC prior to it being used in any of the proposed reactors.

MD178–11 **DOE Policy**

DOE acknowledges the commentor's concern regarding the use of MOX fuel in FFTF to produce tritium. As discussed in Appendix D of the SPD Draft EIS, DOE did consider FFTF in the *Storage and Disposition PEIS*, but it was eliminated from further study because it was in a standby status and it could not satisfy the criterion of completing the disposition mission within 25 years using the historic FFTF plutonium enrichment specifications. In December 1998, the Secretary of Energy decided that FFTF would not play a role in producing tritium. As discussed in Section 1.7.4, Appendix D was deleted from this SPD EIS because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source.

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disposition of remainder of surplus". This needs a clear explanation. Isn't there really enough to defend making changes at commercial reactors to use MOX or what? If the amount is that small — the potential problems at commercial sites it could cause is really not worth the effort I would think. 11

10. There should be a clear alternative plan as to what to do with MOX spent fuel from commercial reactors use. Can it be put above ground at DOE site? (instead of repository plans which may not work) 12

11. Summary p S-19 you say "MOX fuel would be removed from the reactor and "managed" at the reactor site as spent fuel" — How?? You don't address this at all. 13

12. Can you really get all the gallium and other impurities out? Check carefully as to how all this will affect commercial reactor spent fuel pool water. Reactor pools have different temperatures, and different criteria. 14

13. p S-27 of summary – you say "MOX assemblies would be removed from the reactor as soon as the fuel had been irradiated enough to meet the Spent Fuel Standard, rather than being left in the reactor for the maximum length of time". How? Pools are near full and full core unloads are a problem scheduled with dry cask loading — wouldn't taking MOX assemblies out early even cause more core unloading at reactors and problems?
You also say on this page that "There would be sufficient space at the reactor site in either spent fuel pools or dry storage to store the additional spent fuel until it could be sent to a geologic 15

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MD178–12 **Repositories**

This comment is addressed in response MD178–3.

MD178–13 **Repositories**

This comment is addressed in response MD178–3.

MD178–14 **Plutonium Polishing and Aqueous Process**

At the time DOE issued the SPD Draft EIS, it believed the gallium content in the plutonium dioxide feed specifications for MOX fuel could be reached using the dry, thermal gallium removal method included in the pit conversion process. However, in response to public interest on this topic and to ensure adequate NEPA review in the event that the gallium specification could not be met with the thermal process, an evaluation of the potential environmental impacts of including a small-scale aqueous process (referred to as plutonium polishing) as part of either the pit conversion or MOX facilities was presented in Appendix N of the SPD Draft EIS. On the basis of public comments received on the SPD Draft EIS, and the analysis performed as part of the MOX procurement, DOE has included plutonium polishing as a component of the MOX facility to ensure adequate impurity removal from the plutonium dioxide. Appendix N was deleted from the SPD Final EIS, and the impacts discussed therein were added to the impacts sections presented for the MOX facility in Chapter 4 of Volume I. Section 2.18.3 was also revised to include the impacts associated with plutonium polishing. Therefore, it is not expected that there would be gallium or other impurities present in sufficient quantity to adversely affect the reactor pools. However, information would likely be needed by NRC during the reactor license amendment process on the proposed plan for storing MOX spent fuel at the selected reactor sites.

MD178–15 **Waste Management**

DOE acknowledges the commentor's concern about core unloading and cask storage. The statement quoted by the commentor that MOX assemblies would be removed from the reactor as soon as the fuel had been irradiated was originally stated in the *Storage and Disposition PEIS* to demonstrate that there would be sufficient spent fuel storage capacity under the MOX approach. Actual planned operations, however, include refueling on the

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repository". I wonder about the feasibility of this at all. Check the detail of what is happening at commercial reactors now. They are all in need of more storage and dry casks. I've been following the fiasco of the VSC-24 cask all the years since it was in a proposed rule. Why WEPCO in WI was backed against the wall with the NRC hold on cask fabrication because of (seal weld cracks in the design) so that our Public Service Commission allowed WEPCO to purchase 3 TN-32 casks (even before the TN-32 was NRC certified) because they were the only casks that WEPCO could get fabricated in time, if they couldn't load their VSC-24s. What a mess! 15

14. Can MOX spent fuel be put in a pool next to other spent fuel? any concerns? Check this now.
15. Can MOX spent fuel be put in a cask with other spent fuel from a reactor? any concerns? Check this now. 16

16. I think ratepayers and tax payers should not have to end up being liable for costs of problems of MOX fuel at a commercial reactor. Our electricity shouldn't have to rely on using military waste and the potential problems that could occur. We had possible blackouts all last summer because of cask problems and safety concerns at our Pt. Beach nuclear plant. 17

17. Are you considering the safety record of commercial plants? 18

18. Are you considering their priorities of making money for their stockholders? Ratepayers in Wis. got stuck with paying costs for Pt. Beach so stockholders would get their funds. It was a cause of great concern here. DOE has no business mixing with ratepayer costs. 19

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same schedule that is currently used for LEU fuel with no modification to permit the early withdrawal of MOX fuel.

MD178–16 **Waste Management**

This comment is addressed in response MD178–6.

MD178–17 **MOX RFP**

DOE agrees that it should not be involved in the business of generating electricity or delivering electricity to customers. DOE's *RFP for MOX Fuel Fabrication and Reactor Irradiation Services* (May 1998) ensures that these businesses reside solely in the domain of the utilities without any DOE involvement.

MD178–18 **MOX RFP**

The operating records of the selected reactors was considered by DOE prior to awarding the contract for MOX fuel fabrication and irradiation services.

The remainder of this comment is addressed in response MD178–9.

MD178–19 **MOX RFP**

DOE agrees that it should not be involved in ratepayers costs; the RFP was written to ensure that the generation and delivery of electricity to customers be performed solely by the utility with no DOE involvement. The intention is for the use of MOX fuel to be revenue neutral for utilities. Commercial reactors in the United States are capable of safely burning MOX fuel. DOE believes that the cost to make existing reactors suitable for using MOX fuel would be relatively low and would be limited to some analyses and operating license amendments.

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19. There has been a huge problem with responsibility and liability for CHANGES in cask designs — this include handling equipment such as transfer casks in the pool, transporters to the pad, pad evaluations, heavy load equipment - cranes etc. in pools — if a vendor, subcontractor, contractor, licencee (utility) (and now DOE too!) changes any part of this design and this change causes a problem, and this problem has costs – then you'd better decide now who pays. If DOE says to fabricate the casks "this way", then do utilities say DOE pays when it causes a handling problem or doesn't relate to their existing cask pad, transporter, transfer cask, monitoring system or whatever else? You are dealing with whole systems here, not just a garbage can at the back door. People fail to realize this ahead and it causes problems. How does MOX really fit into all this? 20

20. Each commercial reactor needs its own site specific changes. Some have already committed to a certain dry storage system. Are they reliable? What is their vendor, contractor, subcontractor QA history? Right now, I see none out there with great qualifications or long term safe history. And no dry cask has ever been unloaded. The unloading procedure for MOX fuel in any cask design had better be very carefully scrutinized by NRC now, not after casks have been loaded like with the VSC-24 design cask which had an inadequate unloading procedure. Steam shock 21

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MD178–20 **Waste Management**

This comment is addressed in response MD178–6.

MD178–21 **Waste Management**

DOE acknowledges the commentor's concerns regarding dry storage reliability, vendors, and quality assurance. NRC will review these issues as part of the reactor operating license amendment process. These are utility operational responsibilities that would have to be addressed regardless of fuel type.

The remainder of this comment is addressed in response MD178–6.

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in cooling fuel and venting etc — time limits for boiling
etc. need to be set now, not later. Will MOX fuel
in a cask need changes in unloading procedures? 21
(And expect an emergency unloading necessary early —
and be ready for it.) This spent fuel is not going to
any repository for a long time I wouldn't suppose.

21. Will MOX fuel in pools or dry casks need any
special monitoring? Decide this now. How will this be done? 22

22. Will MOX fuel in canisters affect transfer cask,
transporter movement, or cask pad design
requirements (soil tests etc?) Decide this before a 23
reactor gets MOX. What will doses be at a cask pad?

23. Can a cask vendor or a utility sue the DOE? 24

I really just think this is a huge mistake to use MOX
at commercial reactors. We have always kept the military waste
separate and you can expect problems by changing this. On its
face it sounds "win win" — DOE gets rid of waste and reactors
get cheap fuel — but in reality, when you look at what really
is the situation, it is very "lose-lose". DOE gets mixed up
in commercial reactors and utilities problems in dry cask
storage and decommissioning and aging reactor problems. DOE 25
is asking for trouble. Don't do this - Just immobilize all
the surplus plutonium and take care of it your way,
yourselves, so you are responsible for what you do. Your
whole priority list for the repository will be a mess otherwise
and, in essence, you are promoting longer commercial reactor
use and licensing, and more waste you have no place to put.
Lets face it, most of this will be at reactor sites in
dry casks for many many years. Will DOE be on watch here?

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MD178–22 **Waste Management**

MOX fuel would be handled the same as other fuels with regard to pools and dry casks, and there is no need for special monitoring.

MD178–23 **Waste Management**

Dry casks are designed and certified for a maximum heat load; therefore, doses at the cask pad would be expected to be same for MOX fuel as for other fuels.

MD178–24 **Waste Management**

DOE cannot be sued by a cask vendor or a utility in the event a cask fails due to the inclusion of MOX fuel. The reactor licensee would be responsible for safely storing MOX spent fuel and must make all the calculations to show that this can be done properly before the fuel is put into the cask. Cask operations would be subject to the NRC operating license amendment process.

MD178–25 **DOE Policy**

Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

The remainder of this comment is addressed in responses MD178–2 and MD178–3.

8.

24. The gallium problem is a big concern. If it chemically attacks zirconium and some is left in the spent fuel, then what happens in a cask stored 20 – 100 years? We need to be sure of what might happen here. Take time to do the necessary tests – <u>not</u> just computer models on paper. 26
25. How much will gallium removal cost? Is it worth it?
26. What is the morphology of hydride-derived powder? 27
27. The rest of the world does <u>not</u> have an NRC. How do we know their casks are safe or their MOX fuel has no gallium etc.? Why are we setting the example of proposing to use MOX fuel in reactors? Surely Russia and other countries will want to too. Won't this be more of a risk? They aren't regulated as we are. The more plutonium you allow in the public sector, the more they will want to also. Don't do it and don't allow them to either. Canada either. (We don't regulate Canada. 28
28. I've read where even the manufacture of mixed-oxide fuels creates serious risks of diversion because plutonium tends to stick to the surface of remotely-operated processing equipment. If this is so, here is another problem. 29
29. Seems to me <u>other countries will use the pretext of military plutonium disposal to build and operate nuclear plants to depend on the plutonium for fuel, this would be a concern.</u> 30
30. We need to take the lead in straightforward plutonium immobilization or it will have to be transported long distances, with much handling, and stored at civilian reactors. This is asking for trouble worldwide. 31
31. There would be a greater heat load at reactors and then in any repository too, wouldn't there? 32
32. Will MOX fuel be "free" to reactors? If so, why??? 33

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MD178–26 **Plutonium Polishing and Aqueous Processing**

As discussed in response MD178–14, DOE has included plutonium polishing as a component of the MOX facility so it's not expected that there would be gallium and other impurities present in sufficient quantity to adversely affect the reactor spent fuel plans. However, these plans would be subject to NRC review and approval prior to using the MOX fuel in the selected reactors.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. The *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999) covers recent life-cycle cost analyses associated with the preferred alternative, including the cost of plutonium polishing. This document is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

MD178–27 **Pit Disassembly and Conversion**

Plutonium metal parts separated from pits and other nonpit plutonium metals and alloys undergo a hydride-oxidation process as described in Section 2.4.1.2, to produce clean plutonium dioxide powder that is suitable as feed material for MOX fuel fabrication. This powder is free of moisture and impurities, such as tritium and halide. It is stored in stainless steel cans that are welded shut to ensure purity and accountability.

MD178–28 **Nonproliferation**

As discussed in Section 2.4, there are provisions for international inspections of each of the proposed surplus plutonium disposition facilities. International monitoring and inspection of the unclassified plutonium would also allow the United States to demonstrate to the world, including Russia, Iran, Iraq, Pakistan, India, and North Korea, that disposition is being carried out under stringent nonproliferation controls, and that the excess plutonium is not being diverted for reuse in weapons. The United States is working closely with Russia to develop a bilateral inspection agreement which would allow the United States to monitor Russian plutonium disposition efforts and vice versa.

In the SPD Draft EIS, DOE retained the option to use some of the surplus plutonium as MOX fuel in CANDU reactors, which would have only been undertaken in the event that a multilateral agreement were negotiated among Russia, Canada, and the United States. Since the Draft was issued, DOE determined that adequate reactor capacity is available in the United States to disposition the portion of the U.S. surplus plutonium that is suitable for MOX fuel and, therefore, while still reserving the CANDU option, DOE is no longer actively pursuing it. However, DOE, in cooperation with Canada and Russia, proposes to participate in a test and demonstration program using U.S. and Russian MOX fuel in a Canadian test reactor. A separate environmental review, the *Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment* (DOE/EA-1216, January 1999), analyzes the fabrication and proposed shipment of MOX fuel rods for research and development activities involving the use of limited amounts of U.S. MOX fuel in a Canadian test reactor. A FONSI was signed on August 13, 1999. Both of these documents can be viewed on the MD Web site at http://www.doe-md.com.

MD178–29 **Nonproliferation**

DOE is aware of an incident involving a Japanese plutonium processing plant in which a significant amount of MOX powder was held up in the processing lines so that it was difficult to measure the exact quantity of materials from outside the sealed gloveboxes. This problem was solved by implementing a model schedule of selective clean-outs so that the powder could be collected and accurately accounted for. The design and operation of the MOX facility would incorporate lessons learned (regarding procedures and equipment) to ensure low net plutonium loss and would be compatible with NRC and IAEA safeguards. Physical inventories, measurements, and inspections of material both in process and in storage would be used to verify inventory records.

MD178–30 **Nonproliferation**

DOE acknowledges the commentor's concern regarding the use of nuclear reactors to disposition weapons-usable plutonium. The United States will not support any plans to build a plutonium economy.

The remainder of this comment is addressed in response MD178–2.

MD178–31 **Alternatives**

As indicated in Appendix L, several of the hybrid alternatives would require less transportation of special nuclear materials than some of the 50-t (55-ton) immobilization alternatives. However, the risks from transportation for all of the alternatives would likely be minor.

MD178–32 **Repositories**

After the first 5 years or so, there would be more decay heat produced by the MOX spent fuel than traditional LEU fuel, hence a greater heat load at both the fuel storage locations and the potential geologic repository. However, the additional heat load is about 10 percent per assembly and would be considered in the total heat load calculations for any storage facilities and the repository.

MD178–33 **MOX Approach**

The MOX fuel would not be free to the reactors selected to use it. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

9.

33. How much will it really cost to convert reactors to use and handle and store MOX? Do you really know? 34

34. Using MOX fuel hinders the development of other safe clean renewable energy options all over the world. This is wrong. Think about it. 35

35. What plans have you for reactor security against sabotage? Cost? 36

36. Isn't it possible really that other countries will make spent fuel out of weapons plutonium only to extract more plutonium out of reactor spent fuel perpetuating a cycle of possible threat and diversion? This is dangerous. 37

37. In essence MOX really is a subsidy to keep operating aging uneconomic reactors all over. The public is against this clearly. More complicated waste will be created from this dangerous cycle also. 38

38. Utilities are not licensed to use plutonium in their reactors. Getting licensed could be a long battle with hearings and public opposition. Why open up this can of worms? 39

39. Won't using MOX just encourage pork-barrel interests in plutonium in Russia? Are you really seeing what might happen there? Aren't we really setting an example of a military-industrial complex? 40

40. Will utilities using MOX get to waive contribution to the nuclear waste fund? If so this is asking for economic disaster for disposal. Retrofitting or repairing at reactors for MOX could far out weigh this. DOE will cost more by using MOX than if they would immobilize all plutonium surplus. (You can't predict all the problems and costs of MOX) 41

41. Are utilities actually offering to allow the US government to use their facilities for a fee? If so, this is just 38

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MD178–34 **Cost**

This comment is addressed in response MD178–26.

MD178–35 **DOE Policy**

By fabricating MOX fuel from surplus plutonium, the United States is not encouraging domestic or foreign commercial use of plutonium as an energy source. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this.

The development of alternative or renewable energy sources is beyond the scope of this EIS.

MD178–36 **MOX Approach**

Reactor sites in the United States have significant security requirements to prevent sabotage. Sabotage scenarios are considered conjecture and not reasonably foreseeable. Although they were excluded from this SPD EIS, the results of such sabotage would be bounded by the accidents presented in Appendixes K and L. The possibility of sabotage would be controlled through the safeguards and security provisions including security requirements associated with facility workers. The reactors selected to use MOX fuel would continue to be operated in accordance with applicable NRC requirements. Additional information on specific security issues is discussed in *Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Excess Plutonium Disposition Alternatives* (DOE/NN-0007, January 1997).

MD178–37 **Nonproliferation**

Approximately 726 t (800 tons) of plutonium exists in spent fuel in the world today. The spent fuel assemblies are so large and radioactive that any attempted theft of the material would require a dedicated team willing to suffer large doses of radiation, along with substantial equipment for accessing and removing the spent fuel from the storage facility and carrying it away. A terrorist group must also have a shielded reprocessing facility to recover the plutonium from the highly radioactive spent fuel.

MD178–38 **DOE Policy**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

The remainder of this comment is addressed in response MD178–2.

MD178–39 **NRC Licensing**

DOE acknowledges the commentor's concern about licensing reactors to use MOX fuel. Although no U.S. commercial reactors are licensed to use plutonium-based fuel, several are designed to use MOX fuel, and others can easily accommodate a partial MOX core. DOE understands that DCS would have to apply for a reactor operating license amendment for each individual reactor before it can use MOX fuel and what that process entails, including the public involvement opportunities provided by NRC per 10 CFR 50.91. DOE is conducting regular meetings with NRC on the MOX approach, including fuel design and qualification. In addition, DCS would work closely with NRC to ensure that the license amendment process can be accomplished in a timely manner.

On June 15, 1999, DOE held a hearing on the Supplement to the SPD Draft EIS which focused on the use of MOX fuel at the selected reactors. As a result, DOE does not anticipate the licensing requirements would present a significant impediment to implementing its decisions on surplus plutonium disposition. Efforts have been made to contact persons living near the selected reactor sites and inform them of the proposed use of MOX fuel. Approximately 1,300 copies of the Supplement were mailed, and an NOA postcard was mailed to an additional 5,800 members of the public.

The remainder of this comment is addressed in response MD178–25.

MD178–40 **Nonproliferation**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Close cooperation between the United States and Russia is required to ensure that nuclear arms reductions cannot be easily reversed. Understanding the economic dilemma in Russia, the U.S. Congress has appropriated funding for a series of small-scale tests and demonstrations of plutonium disposition technologies jointly conducted by the United States and Russia. For fiscal year 1999 (starting October 1998), Congress further appropriated funding to assist Russia in design and construction of a plutonium conversion facility and a MOX fuel fabrication facility. This funding would not be expended until the presidents of both countries signed a new agreement. Although the amount appropriated by Congress is not sufficient to fund the entire Russian surplus plutonium disposition program, the United States is working with Russia and other nations to resolve this issue.

MD178–41 **MOX Approach**

Utility contributions to the nuclear waste fund would not be waived for those reactors selected to use MOX fuel. The cost-related aspects of this comment are addressed in response MD178–26.

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plain wrong. You want to give them free fuel, cancel their waste fund debt, then pay them?? This makes no sense at all in the public interest. Tax payers and ratepayers will end up footing the bill for problems. 38

43. Standardization and integration in the total storage, transport, and disposal of radioactive waste used to be a main DOE goal. Seems to me MOX adds one more type of waste to deal with in all this. 42

(13) * Seems to me the federal government is unlikely to allow a power producer to fail if that producer has become a critical part of a plutonium disposition program involving MOX burning. This is very possible and just a situation you do not want to get into. 38

44. How can we regulate MOX fuel use in Canadian reactors? 43

45. Wouldn't a reactor accident involving MOX fuel be even more dangerous? 44

46. Nuclear reactors that are not economical should not be propped up courtesy of tax payers. Use of MOX would set up a reprocessing infrastructure which is uneconomical, unsafe, and prone to nuclear proliferation. And tritium production should not be at commercial reactors either. The public does not want this. 38

47. This business of (p2-8-Volume 1-Part A) of awarding a contract in November seems all wrong. The "offerors" has a perfect set-up to make "deals" with commercial reactors it proposes for irradiation of the fuel. All this so called "paper work" design does not cover dry cask storage, or unloading, or loading, casks with 45

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MD178–42 **Waste Management**

Standardization and integration of the treatment, storage, transport, and disposal of waste is a DOE priority as evidenced by the preparation of the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (WM PEIS) (DOE/EIS-0200-F, May 1997) and *Accelerating Cleanup: Paths to Closure* (DOE/EM-0362, June 1998). In addition, decisions in the *Storage and Disposition PEIS* ROD included reducing the number of storage locations where plutonium is stored by consolidating the storage of pits at Pantex and nonpit materials at SRS. This action reduces the number of DOE sites generating wastes related to plutonium storage activities. As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies.

MD178–43 **Parallex EA**

This comment is addressed in response MD178–8.

MD178–44 **Facility Accidents**

Section 4.28 was revised to provide reactor-specific analyses and discuss the potential environmental impacts of using a partial MOX core during routine operations and reactor accidents.

MD178–45 **MOX RFP**

The schedule for award of the MOX fuel fabrication and irradiation contract was in accordance with DOE's procurement and NEPA policy. DOE's NEPA implementing regulations in 10 CFR 1021.216 requires DOE to phase contract work in a way that will allow the NEPA review process to be completed in advance of a go/no-go decision. In the case of this SPD EIS, the go/no-go decision will be determined by which alternative is selected by the decisionmaker. Further, the provisions of 10 CFR 1021.216 call for DOE to prepare a publicly available synopsis of the environmental information to provide to the source selection official in order to document the consideration

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MOX, or handling MOX by transfer casks in the pool, or transporters to the concrete yards etc. We had an explosion at our Pt. Beach plant here in Wisconsin loading a VSC-24 cask with regular spent fuel because the cask coating created flammable hydrogen. Do you Know how MOX will react with cask coatings, etc? 45
Dry cask storage of MOX is a major concern. Any proposal by an "offerer" needs to address this issue in detail. (Make sure a pad for mox fuel casks is soil tested for the pad area not based on the reactor site as it was at Palisades — the pad was on sand dunes but the reactor was on bedrock — yet That was what was used for initial evaluation!)

48. Reactor specific information provided by the offerer of the MOX plan will be verified by whom? Will you check the safety history of these specific reactors in the NRC public documents? You need to. If the have a history of nonconformance + violations and fines; if they have embrittlement or steam generator problems; if they have fuel pool or dry cask concerns — certainly tax payer don't want to do business with 18
them. This "package deal" of a MOX manufacturer, and its irradiating reactors, sounds like too "sweet" a situation to me. Here in Wisconsin, our utility was all involved in the initial creation of the VSC-24 cask design and almost had to use it then as I see it — even though it was a mess and had problem after problem. They ended up using their own QA with their own contractors when Sierra Nuclear

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given to environmental factors and to record that the relevant environmental consequences of reasonable alternatives have been evaluated in the selection process.

DOE prepared an Environmental Synopsis on the basis of the environmental information reviewed by DOE in the selection process. This was released to the public as Appendix P of the *Supplement to the SPD Draft EIS* in April 1999. This *Supplement* included a description of the affected environment around the three proposed reactor sites, and analyses of the potential environmental impacts of operating these reactors using MOX fuel (Sections 3.7 and 4.28 of this SPD EIS, respectively). During the 45-day period for public comment on the *Supplement*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. Responses to those comments are provided in Volume III, Chapter 4.

Any requirements related to the storage of MOX fuel would be imposed by NRC as part of the reactor operating license amendment. For this amendment, the licensee would have to demonstrate that all safety, testing, and environmental impacts have been addressed as well as complete the public hearing process. In addition, NRC would evaluate license applications and monitor the operations of both the MOX facility and the commercial reactors selected to use MOX fuel to ensure adequate margins of safety.

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made so many mistakes. Are we going to get into
the same sort of situation with a MOX vendor? 18
49. This needs to be looked into now as NRC is in process
of rulemaking on this sort of thing for cask vendors.
<u>Can a supplier of MOX fuel be fined for violations</u>
<u>in any way?</u> It should be and its contractors
and subcontractors should be held to NRC
regulations. Vendors of casks could not be fined 46
for violations before. Now NRC has a proposed rule
to give them this clout to get cask vendors in
shape. Shouldn't this be the same for a
MOX fuel vendor too? What's to keep them
doing quality work and following regulations?
50. There has been great concern on the part of the
public that SARs have not met reality
or enforced — (for plants and for dry cask
storage) in some cases. — final safety
analysis reports need to be kept amended so
that documents always meet reality and
SAR's should be enforceable. This needs to 47
be looked into <u>now</u>, not later. It was a big
problem and still is. I have a proposed rule
in with NRC to require documents kept
current. This needs to be done or utilities
and vendors and DOE and NRC won't be working
with documents dealing with what is "really"
there. MOX use needs to have documents in order and current.
51. Volume 1 - Part A p 2-37 It appears your fuel fabrication 48
area plans to accommodate the potential for

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MD178–46 **NRC Licensing**

The MOX fuel fabricator would be an NRC licensee under 10 CFR 70, *Domestic Licensing of Special Nuclear Materials*, and as such, would be subject to fines and penalties for violations of NRC regulations, up to and including license revocation.

MD178–47 **NRC Licensing**

The reactors selected to irradiate MOX fuel are operating domestic, commercial reactors and are licensed by NRC. DCS would be required to submit an application for a reactor operating license amendment under 10 CFR 50.90 for each individual reactor before it can use MOX fuel. Reactor licensees are responsible for maintaining reactor SARs current in accordance with NRC regulations. NRC regulations in 10 CFR 50.59 allow changes that meet certain requirements to be made without prior NRC approval. Proper review and documentation of the review must be retained at the reactor site for NRC inspection. Changes other than these must be approved by NRC prior to implementation, and all changes must be included in biennial SAR updates. Reactor SARs would be updated to reflect the use of MOX fuel once the operating license amendment was issued.

MD178–48 **Parallex EA**

This comment is addressed in response MD178–8.

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fabricating a <u>different</u> type of fuel for CANDU reactors (if an agreement is made with Russia and Canada). There is no clear explanation for this. Does Russia have CANDU reactors? Why would we want to generate spent fuel that does not fit in our certified dry cask storage designs? Canadian fuel and casks are different than ours. Won't this cause just one
more waste type to complicate our at reactor storage 48
problems and repository criteria for containers? We already have "radioactive soup" of so many waste types that it's very difficult to plan for repository containers now — all these different sizes and heat loads, etc. just complicate the matter more. And NRC does not regulate Canada. Will we take Canadian spent fuel back? Liabilities?

52. p2-30 you say, Individual MOX assemblies could be stored for as long as 18 months prior to shipment to a
reactor. What if one of those reactors shuts down or has 49
major problems and can't use the fuel? What then? How will you store the fuel safely? How far ahead can you make it safely?

53. — this "polishing step" to remove gallium seems to be a real concern. Seems to me you are adding a real possible problem to the whole waste system here that really isn't necessary — for isn't "haste" the really only reason for using MOX? You want to get as much plutonium into an unusable
form as fast as you can? Haste makes waste!! (an old saying 50
but true — you may be creating <u>more</u> problems.)

54. Volume II, appendix N — Plutonium Polishing — this should "not be only a contingency". It should be a detailed planned requirement. When used, you have a new waste form of gallium americium, aluminum, and flourides. You have all this liquid and solid waste from MOX fabrication to deal with. Plus

MD178

MD178–49 **MOX Approach**

Fresh fuel would remain safe and stable indefinitely. It would be stored at the MOX facility in a storage vault meeting security requirements for special nuclear materials. The MOX facility would be built at an existing DOE site that has the levels of protection and control (including access control) required by applicable DOE safeguards and security directives. In addition to DOE sitewide security services, the facility would have its own security features and procedures. The general security requirements for the proposed surplus plutonium disposition facilities are described in Section 2.4.

The SPD Draft EIS's specification of assembly storage for up to 18 months is a bounding assumption for planning and analysis purposes. This SPD EIS reflects an extension of the possible storage time of individual assemblies to up to 2 years, a storage period that is neither expected nor desirable from a business standpoint. As stated in Section 2.4.3.2, production would closely follow product need. Reactor licensees typically order LEU fuel to coincide with their refueling outages, and fuel shipment is usually scheduled so that fuel does not have to be stored very long at the reactor site. Licensees work closely with each of the vendors involved in the fuel fabrication process, as well as the fuel fabricators, to ensure that the fuel is ready when needed. The only likely difference in this process for MOX fuel would be a closer relationship between the licensee and the fabricator; the two would work as a team. Reactor shutdowns and other operational issues that could affect the need for fuel would be accommodated in the fuel fabrication schedules, and adjustments would be made as required. Fuel fabricated and later not needed would constitute no long-term storage problem, for the components could be recycled and reused—a routine commercial practice for off-specification materials and completed assemblies that is accounted for in this EIS. The fuel rods would be disassembled and the pellets either reused directly or returned to the processing facility for reformulation. The metal components of the fuel rods would also be reused or recycled.

MD178–50 **Plutonium Polishing and Aqueous Processing**

Section 2.18.3 was revised to include the impacts associated with plutonium polishing. As indicated by the analyses, additional waste generation or

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the volume of waste (hazardous and non hazardous) increases
20%. Wastewater generation increase 8 to 20%. (How do you
plan to remove this in "PORTABLE TOILETS"?? Seems strange!)
Electrical consumption increases by 5,500 MWh/yr and more
"footprint" space is needed and would be contaminated.
You say (on p N-8) that "Waste could be a fairly large
** percentage of the total waste generated by the disposition 50
facilities". (TRU waste requiring storage increases).
TO make more waste by trying to eliminate
* surplus plutonium in MOX fuel makes no sense
considering our critical waste problems already in this
country.

55. Volume I Part A — p 2-65 and 2-68 on post irradiation
examination siting alternatives — I notice you say these
tests would provide information on how MOX would
respond being inside an operating reactor. But is this
* representative of the commercial reactors that in reality
would use MOX? And can you test as to how MOX
spent fuel would react inside dry cask storage? That
is the thing you need to look at. You say that at
any rate the HFEF is presently being modified to accept
"commercial size" fuel assemblies and to handle commercial 51
size casks and fuel rods for examination. So this all
all sounds new. So much in past documents I've read, the
tests have been on part of a rod or assembly which
is not enough of representation as I see it, also prototypes
such as the VSC-17 were tested instead of a full-
size VSC-24 cask, and there were major differences
between these. You need to examine full MOX
assemblies. I never can understand visual exam, or

MD178

resource consumption associated with the plutonium-polishing process is not expected to materially affect the ability of any of the candidate sites to handle MOX fuel fabrication.

The remainder of this comment is addressed in response MD178–14.

MD178–51 **MOX Approach**

The lead assemblies would be irradiated in domestic, commercial reactors and then subjected to postirradiation examination. Thus, the tests conducted as part of the postirradiation examination would provide information on how MOX fuel would respond inside a commercial reactor. The MOX fuel assemblies would be placed in accordance with specific reactor fuel management plans, which exist at all reactors regardless of fuel type.

The remainder of this comment is addressed in responses MD178–3, MD178–6, MD178–7, and MD178–10.

even UT, gamma spectroscopy, neutron radiography of an assembly? Do you take it apart in any way to evaluate the different affects in the reactor from outer rods to center rods in the assembly? This should be done.

And — <u>where</u> in the reactor will these MOX assemblies be irradiated? This is crucial information, as certainly the placement in the reactor dictates the affect on the assembly. Can you really fortell reactions <u>over time</u> in a real reactor from these tests? I fear all the "what ifs" can't be covered. The last thing we need is to build this MOX fabrication facility – put these assemblies in commercial reactors, and find we have an unexpected problem in the public arena. Why take this risk when it just is not necessary. Get rid of all the surplus plutonium in immobilization the same for all of it without risking MOX problems. 51

Can you really predict how MOX spent fuel will react when put in the pool with regular spent fuel? Over time? How will it react in dry cask loading in the pool? How will it react in dry cask <u>un</u>loading in the pool? Can you expect to have dry transfer from a cask on the pad in the future to a transport cask <u>without</u> necessitating it go back to the pool and get wet again for transport to a repository? All this <u>future</u> handling. Are you looking at the details? Consider this: MOX fuel in the reactor (dry), in the pool (wet), in casks at the plant (dry), unloaded in the pool (wet again), transported to a repository or interim storage site (dry again), put in a repository (maybe transferred to a <u>disposal</u> cask 1st (wet or dry handling?) then dry in

MD178

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the repository (hopefully if drip shields work and humidity and evaporation predictions are correct) — and in the end, after many years we hope, — wet in the repository. Look at this total waste future for MOX fuel. What problems do you foresee? When it finally gets wet in the repository next to other waste forms, what can happen? And if MOX fuel goes to a repository 1st, what happens? And what storage, and disposal, and transport containers do you need for irradiated MOX spent fuel? Can they be certified, and tested in time? NRC has a full load on its hands now just trying to keep up with the certification of dry cask designs for regular spent fuel — and fabrication changes cause a problem in QA and scheduling. Time is crucial and reactors pools are loaded. And then too, will local public opposition and Public Service Commission procedures or transportation concerns etc cause hold-ups in schedules? The longer you wait to get MOX really tested and everything in place, the more the reactors are aging and their pools filling. MOX fuel will add to the overload in the whole spent fuel waste problem. Don't do it. 51

56. We don't know how well WIPP will work yet. We don't know if Yucca will ever open? We don't even dare to think of siting a necessary 2nd or 3rd repository yet. However, everybody acts like a hole in the ground will take all the military and commercial waste and take care of it. I don't believe this. I predict it will mostly be kept above ground, recasked periodically like Russian dolls inside each other, and monitored and safeguarded 52

MD178

MD178–52 **Repositories**

The management of TRU wastes generated by the proposed surplus plutonium disposition facilities is evaluated in this SPD EIS. DOE alternatives for TRU waste management are evaluated in the WM PEIS (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). WIPP began receiving shipments of TRU waste for permanent disposal on March 26, 1999. As described in Appendix F.8.1, and the Waste Management sections in Chapter 4 of Volume I, it is conservatively assumed that TRU waste would be stored at the candidate sites until 2016, at which time it would be shipped to WIPP in accordance with DOE's plans. This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel.

The remainder of this comment is addressed in response MD178–3.

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forever. The public and even native american tribes cannot be bribed to accept this waste in their backy and any place — as history has proven over time. Yet the nuclear industry and DOE just keep acting as if repositories are the answer. TIME is a concern here. The longer you keep reactors going, the more spent fuel is created and that in itself is the crux of the problem with MOX fuel. You are creating more and more spent fuel nobody knows what to do with or where to store or dispose. Commercial reactors hope DOE will take it from their sites — out of their hands as far as liability and responsibility — they hope to put it in cheap casks, which may allow spent fuel degradation, then drop it in the governments lap and walk away from nuclear power in the end. No new nuclear plants have been built — the public doesn't want the plants or more spent fuel — MOX just adds to the problem — all over the world. What do you think Russia will do with their spent fuel? Put it in the most expensive, safest canister? I doubt it. Costs will be cut wherever possible and that means problems. You know that. 52

57. I just find section 4.28 "Summary of Storage and Disposition PEIS Generic Reactor Analysis" very lacking. Just 2 pages here to cover the public. Specific reactors are not generic. Each is very different. We found that out when NRC tried to certify a "generic" cask. It ended up needing many site specific changes in design and handling procedures for each plant. Pool water is 53

MD178

MD178–53 **MOX RFP**

Generic reactors were presented in the SPD Draft EIS because the specific reactors had not yet been identified. Section 4.28 was revised to discuss the potential environmental impacts of operating Catawba Nuclear Station Units 1 and 2 in South Carolina, McGuire Nuclear Station Units 1 and 2 in North Carolina, and North Anna Power Station Units 1 and 2 in Virginia, the reactors selected to use the MOX fuel.

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different, equipment is different, some handling equipment didn't fit in existing areas or didn't relate to existing equipment or heavy load criteria. Each reactor has many site specific needs, There is no generic reactor. You say a small "addition" may be needed to the fuel receiving and storage building. Just getting a cask transporter in the small door of our auxillary building at the Wis. Pt. Beach reactor was a problem. The transporter had to be developed especially + lifting lugs had to be added on top of the cask design to get it to fit in. Then weight in the cask loading area may be limiting and weight in casks. Arkansas fuel was longer and weighed more, thus changes were needed in the cask design there too. 53

You say "radionuclide distribution in the waste will be somewhat different" — so how does this react with a cask coating for example? Or next to regular spent fuel in a pool or cask?

You admit more spent fuel would be generated and that you want to remove the assemblies of MOX from the reactor as SOON as it meets the spent fuel standard. Are you considering scheduling for this at a commercial reactor? Refueling is a big thing — a reactor needs to be shut down — we do use this reactor for our electricity remember. and we have a power crunch at peak times of the year in many areas. Would a reactor shut down for repairs, use pools to remove fuel for casks and then shut down again; just to remove 54

MD178

MD178–54 **MOX Approach**

This comment is addressed in responses MD178–3, MD178–9, MD178–15, MD178–18, and MD178–36.

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some MOX fuel? are you looking at the reality as to
how fuel removal from a commercial reactor would
affect its operation? MOX adds to worker overload already.
Plus you say there is an increase in worker
dose, public dose (even if just from more dry cask
handling + storage) and increase in accident and
certainly sabatoge possibilities. I am certainly 54
not comforted that you expect no more problems
"if there are adequate reactivity and thermal
margins in the fuel, as licensing review should
assure." Well it should, but will it? This is
an experiment in the public arena really. You
don't really know all the possible ramifications of
using MOX fuel at commercial reactors.
A truck bomb at a dry cask storage pad
holding MOX fuel really is a possibility. Is a truck
* bomb still not considered at a cask pad at a
reactor? You reference a Final Generic EIS from
the 1970's for using MOX. I find this really 55
unacceptable. Get some current information, a lot
has changed since 1970. I find these "tiered" EIS's
really faulty. (They certainly were for dry cask storage.)
The NRC had an awful time with generic licensing
for dry cask storage at reactors. It took many years
before all the problems were addressed and, in the meantime,
vendors were repeatedly shut down and reactors not able
to load casks. Will the same happen in licensing for MOX 15
fuel in reactors and in casks? This is all new — there
will be problems. As one NRC person said "expect

MD178

MD178–55 **Facility Accidents**

The possibility of a truck bomb was considered to be beyond the scope of this SPD EIS analysis based on DOE NEPA guidance. This guidance states that impacts should be analyzed if they are reasonably foreseeable, requiring that the analysis is supported by credible scientific evidence and is not based on pure conjecture. The terrorist scenario is considered conjecture and although it was excluded from this EIS, the results of such terrorism would be bounded by the accidents presented in Appendixes K and L.

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everything to go wrong that can go wrong" — and it did — this is not a perfect world and the human element for mistakes enters in. 15

Well, I'm tired of all this — your 3 volume report is huge and very repetitious. I agree that you need to get surplus plutonium all over the world in a safe unusable form. I hope the agreement with Russia gets going before its too late. BUT using MOX fuel at commercial reactors is a mistake. 56

I've watched closely for many years now how spent fuel and dry cask storage has been licensed and certified and I forsee the same situation and problems with generic evaluation of MOX fuel at commercial reactors. You have to view it in the whole waste system in the future. See the total picture and plan the details. The world is getting less and less safe. Why put MOX fuel into the hands of the public? It isn't necessary and should not be done. Please.

I am the mother of two fine sons, with a grandchild coming this Christmas. I don't want their kids to face a world full of nuclear waste problems and MOX fuel at our local reactor. We need to phase out spent fuel creation and work toward a safe clean renewable energy system for this world for our kids. A Native American saying state" We have not inherited the earth from our fathers, we are borrowing it from our children." Think about that carefully.

Thank you,

Mrs. John Shillinglaw

(whomever reads this — you — yourself — try to do the right thing — please)

MD178

MD178–56 **General SPD EIS and NEPA Process**

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for proposed surplus plutonium disposition facilities.

Why did the initial EIS [*refers to the scoping process*] not explore or identify all possible alternatives for using the Fuels and Materials Examination Facility (FMEF)? Alternatives were added later, why not from the beginning? 1

DOE should take advantage of the existing complex infrastructure by considering the following combination as an alternative option/alternative: locate pit disassembly and conversion at Pantex; locate MOX fuel fabrication mission at FMEF; locate plutonium conversion and immobilization at the Savannah River Site (SRS). 2

Why does the preferred alternative consider infrastructure and the workforce if the MOX facility is being privatized? Optics are that the EIS is biased toward SRS. 3

RICHLD–1 **General SPD EIS and NEPA Process**

The SPD Draft EIS evaluated all alternatives for FMEF at Hanford considered reasonable by DOE. FMEF was identified as a candidate location in the NOI for the SPD EIS, which starts the scoping process. The possible mix of activities that might be located in FMEF was refined during the scoping process. In fact, the number of alternatives considering FMEF was increased during scoping, even though collocation of all three proposed surplus plutonium disposition facilities in FMEF was eliminated because DOE concluded that the available space in FMEF would not be sufficient to accommodate the efficient operation and maintenance of all three facilities. Analyses do not begin until completion of the scoping process, so these alternatives were evaluated from the earliest possible time, along with all the other SPD EIS alternatives.

RICHLD–2 **Alternatives**

DOE acknowledges the commentor's suggestion to locate the proposed surplus plutonium disposition facilities at three different sites. As discussed in Section 2.3.1 of the SPD Draft EIS, the range of reasonable alternatives analyzed was developed using equally weighted screening criteria. Over 64 options were evaluated, yielding a range of 23 reasonable alternatives that met all the criteria. Options that involved siting the proposed surplus plutonium disposition facilities at three different sites were eliminated because the goals of minimizing worker and public exposure to radiation, minimizing proliferation concerns associated with transportation, and reducing infrastructure costs would not be met. Alternatives considered reasonable were further reduced to 15 that are analyzed in the SPD Final EIS because the 8 alternatives that included using portions of Building 221–F at SRS for immobilization were eliminated based on the increased size requirements.

RICHLD–3 **Alternatives**

DOE's proposed action for surplus plutonium disposition is not a privatization effort, although the acquisition of MOX fuel fabrication and irradiation services has some similarities to DOE's privatization initiative. While the necessary infrastructure may be available in a number of places, only certain DOE sites and other facilities have the security infrastructure and radiological

Environmental cleanup and plutonium conversion missions are not exclusive of each other; one can work effectively with the other [*at Hanford*]. 4

What are the increased costs associated with three separate sites? 5

monitoring services and systems in place to protect special nuclear materials. Although SRS has been identified as the preferred site for the MOX facility, this is only DOE's preference; it is not a decision. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

RICHLD–4 **Alternatives**

DOE acknowledges the commentor's view that environmental cleanup and plutonium conversion missions can work effectively together. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

RICHLD–5 **Cost**

Section 2.3.1 explains the development of the facility siting alternatives that were analyzed in this SPD EIS. The equally weighted criteria used were worker and public exposure to radiation, proliferation concerns due to transportation of materials, and infrastructure cost. These criteria would not be met if DOE were to build one facility at each of three candidate sites.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at

Unions are concerned that DOE has not adequately considered costs and the potential impacts presented by overextending limited funds. 6

DOE is not including the total cost as a consideration in selecting its preferred alternative. The U.S. Nuclear Regulatory Commission (NRC) said cost benefits should be prepared. This is not in keeping with the spirit of the law in applying NEPA. I believe the EIS is incomplete. 7

http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

RICHLD–6 **Cost**

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

RICHLD–7 **Cost**

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively), which do not require that a cost benefit analysis be performed. The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium*

Benton County supports the plutonium disposition process and MOX mission, but feels the EIS has not adequately addressed the cost issue; cost savings are more attractive when viewing the overall DOE funding picture. 8

The national security threat needs further discussion [*this refers to the presentation*]. Focusing on reducing the national security threat posed by surplus plutonium alone is too restrictive to be the program's primary goal. 9

Disposition (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

RICHLD–8 **Cost**

DOE acknowledges the commentor's support for the surplus plutonium disposition program at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

RICHLD–9 **DOE Policy**

DOE acknowledges the commentor's concerns regarding national security. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely

All communities will be working to ensure DOE that they are the best location for performing the MOX and immobilization mission. Hanford's ability to manufacture and produce MOX fuel and to meet nonproliferation concerns is not reflected in the current SPD EIS. 10

DOE has not adequately considered the budget and technical realities of Hanford's existing facilities in favor of building new facilities down south. 11

The Hanford workforce is already at a critical low; we can't perform work now when two people are on vacation. Further workforce reductions place the site's ability to perform necessary work in jeopardy. Hanford's workforce is well trained and well versed in the type of work required by the MOX mission. Hanford's workforce is the most efficient workforce in the DOE system and is capable and ready to work on the MOX fuel program. A *Scientific American* study shows a 16 percent productivity level above baseline by using union workers. Nonunion is 11 percent below. Moving to SRS will reflect that level of reduction in efficiency. 12

manner. By working in parallel with Russia to reduce stockpiles of excess plutonium, the United States can reduce the chance that weapons-usable nuclear material could fall into the hands of terrorists or rogue states and help ensure that nuclear arms reductions will never be reversed.

RICHLD–10 **Alternatives**

DOE acknowledges the commentor's support for siting the immobilization and MOX facilities at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

RICHLD–11 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

RICHLD–12 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

Hanford's workforce is recognized by industry leaders for their specialized abilities and skills. Hanford workers can establish relationships with any employers who come there. 13

FMEF can handle multiple functions/missions effectively. 14

Have there been other analyses conducted that consider pit disassembly and conversion at Pantex with a cost analysis for transporting materials to either SRS or Hanford? The transportation argument falls short. SRS biases are very apparent in the technical documents. Analyses highlighting benefits at other sites were not conducted at Hanford. 15

RICHLD–13 **Alternatives**

DOE acknowledges the commentor's support of the Hanford workforce. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

RICHLD–14 **Alternatives**

DOE acknowledges the commentor's support for using FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

RICHLD–15 **General SPD EIS and NEPA Process**

For a better understanding of cost and transportation issues, consult the following reports: *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), and *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998). These documents are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for surplus plutonium disposition facilities.

I am involved with four different organizations monitoring the program's progress and have made several trips to Washington, D.C., to discuss the issue with various government officials. The barriers and inefficient communication channels that exist at DOE Headquarters block effective cross-fertilization. The communication process has failed, and the message is not getting through. 16

The decision is not about money, it's about political expediency. I wish the decision was based more on the health and safety of the American people. 17

There is a concern that the Portland meeting, attended primarily by Hanford opponents, will disrupt and distort DOE's perception of Hanford's willingness and ability to do the job. The Portland meeting stacks the deck against Hanford. There are no other places where meetings are being held 200 miles from the site. 18

RICHLD–16 **DOE Policy**

DOE acknowledges the commentor's concern regarding effective communication channels at DOE Headquarters. Since its creation, MD has supported a vigorous public participation policy. This policy is facilitated by the availability of a substantial amount of information and the implementation of numerous communication mechanisms (e.g., hearings, workshops, toll-free telephone and fax line, Web site).

DOE gave equal consideration to all comments received during the comment period on the SPD Draft EIS and incorporated changes, as appropriate, in this SPD EIS. Each environmental document is prepared and reviewed by qualified professionals and is subjected to independent review within DOE to ensure that all actions are properly coordinated.

RICHLD–17 **DOE Policy**

DOE acknowledges the commentor's concern regarding the criteria used in the decisionmaking process. The health and safety of both workers and the public is a priority of the surplus plutonium disposition program. DOE would comply with all pertinent Federal, State, and local laws and regulations and would meet all required standards. Chapter 5 summarizes the pertinent environmental regulations and permits required by the disposition program. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

RICHLD–18 **Alternatives**

DOE acknowledges local support for new missions at Hanford and the commentor's concern that other areas in Washington and the State of Oregon do not support new missions. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

DOE needs to consider the technical knowledge of the people when going to Portland. 19

I dislike DOE responding to each comment or remark. I am familiar with the opinions from the officials, and it takes time away from the public comments. 20

Are comments being received as part of a public meeting or a public hearing? Will the testimony be recorded? DOE needs to clearly state at the beginning of the meeting what type of format is in effect. 21

I have been a citizen of Richland for 40 years and am a retired member of the American Nuclear Society. I agree with other statements that there is a bias in the decision process, as well as other comments offered by previous speakers. I want to see an advance agenda prior to the meetings taking place. 22

Dividing up the EIS into environmental impact topics is faulty. 23

RICHLD–19 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's concern about the hearing in Portland.

RICHLD–20 **General SPD EIS and NEPA Process**

In the opening remarks, the facilitator announced that DOE was using an interactive meeting format so that members of the public could obtain immediate answers to their questions and provide DOE with comments that truly represented their concerns. Written comments were also accepted at these hearings from those members of the public who preferred not to speak. The hearings continued until all participants desiring to speak had the opportunity.

RICHLD–21 **General SPD EIS and NEPA Process**

The format of SPD EIS hearings was described in a fact sheet presented to participants at the start of each hearing and was announced by the facilitator who conducted the hearing. In opening remarks, the facilitator explained that all comments were to be recorded by trained notetakers and that an electronic recording was to be made of the hearing as a backup.

RICHLD–22 **General SPD EIS and NEPA Process**

DOE does not have a bias against placing the proposed plutonium disposition facilities at Hanford. The preferred alternative was chosen based on the best information and analyses available to allow for a fair comparison among the candidate sites for the proposed surplus plutonium disposition facilities. In the case of Hanford, DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

RICHLD–23 **General SPD EIS and NEPA Process**

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). It is

From my review of records from past meetings, I feel that DOE is proceeding on a predetermined path. If you don't listen to us, do not come here and waste our time and yours. 24

The SPD EIS should be withdrawn, revised, and reissued from a balanced perspective. 25

intended as a source of environmental information for the DOE decisionmakers and the public. The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts. As with any EIS, technical information is included to the extent that it is required to understand those actions and impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for surplus plutonium disposition facilities.

RICHLD–24 General SPD EIS and NEPA Process

The preferred alternative was chosen based on the best information and analyses available to allow for a fair comparison among the candidate sites for the proposed surplus plutonium disposition facilities. In the case of Hanford, DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

Since its creation, MD has supported a vigorous public participation policy. This policy is facilitated by the availability of a substantial amount of information and the implementation of numerous communication mechanisms (e.g., hearings, workshops, toll-free telephone and fax line, Web site).

DOE gave equal consideration to all comments received during the comment period regardless of how they were submitted. Further, the hearings continued until all participants desiring to speak had the opportunity to do so.

RICHLD–25 General SPD EIS and NEPA Process

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). DOE has analyzed each environmental resource area in a consistent manner across

Why was privatization not discussed during the presentation? Has privatization been excluded from further consideration? 26

I am skeptical about relying on the consortium contract; doesn't the handling of special nuclear material fall under NRC regulation? 27

The cleanup function [*resulting from plutonium disposition*] is left out of the EIS. 28

There is a total of 12 DOE sites. How much plutonium is at SRS? The EIS should look at where the plutonium is. 29

all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for surplus plutonium disposition facilities.

RICHLD–26 **DOE Policy**

DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. Section 4.28 was revised to discuss the procurement process as well as the potential environmental impacts of the reactors that would use the MOX fuel. Regarding pit disassembly and conversion and immobilization, neither process is sufficiently defined or understood to enable the Government to privatize these activities. Plutonium pits of various designs would be disassembled and converted to oxide. The multiplicity of designs may present uncharacterized scopes of work. There are also uncertainties associated with the nature and forms of materials to be immobilized.

RICHLD–27 **NRC Licensing**

NRC is responsible for regulating special nuclear material in the private sector; DOE, for the safe handling and regulation of its own special nuclear material. Under the MOX contract, the possession and use of plutonium by both the MOX facility and the commercial reactors selected to use the MOX fuel would be regulated by NRC.

RICHLD–28 **General SPD EIS and NEPA Process**

Deactivation and stabilization of the surplus plutonium disposition facilities on completion of their mission are discussed in Section 4.31. Options for D&D would be assessed at the end of the useful life of the facilities. The assessments would include engineering evaluations, environmental studies, and NEPA review of various courses of action.

RICHLD–29 **Transportation**

The amount of surplus plutonium at each DOE site is shown in Chapter 1 of Volume I. These amounts and locations are the starting points for determining

Does constructing a new MOX fuel fabrication facility at SRS adjacent to the Actinide Packaging and Storage Facility (APSF) mean that most of the material will be immobilized in a ceramic versus a glass form and not be used for fuel? 30

Is APSF a major factor in determining the preferred alternative? 31

the potential transportation impacts for each of the alternatives analyzed in this SPD EIS. Should DOE decide to implement one of these alternatives, all of the surplus plutonium at each of these sites would eventually be sent to a potential geologic repository. None of the alternatives involve moving Hanford materials to Pantex.

RICHLD–30 **MOX Approach**

A MOX facility would only be constructed to convert the surplus plutonium into MOX fuel. Under the preferred alternative, the immobilization and MOX facilities would be sited next to APSF, if built, at SRS, and a hybrid approach to surplus plutonium disposition would be implemented. MOX fuel would be made from all but the approximately 17 t (19 tons) of surplus plutonium that is unsuitable for such use because of the complexity, timing, and cost that would be involved in purifying the material. All the plutonium unsuitable for use as MOX fuel would be immobilized, preferably in the ceramic rather than the glass form.

RICHLD–31 **Alternatives**

APSF was a factor, but not a major consideration, in selection of the preferred alternative. As discussed in the revised Section 1.6, SRS is preferred for the proposed surplus plutonium disposition facilities because the site has extensive experience with plutonium processing, and these facilities complement existing missions and take advantage of existing infrastructure. Section 2.4 of the SPD Draft EIS discusses the alternatives that considered locating pit conversion or immobilization facilities at SRS and using APSF as the site of a receiving facility for SST/SGT shipments, nondestructive assay facilities, and storage vaults for plutonium dioxide and metal. However, DOE has recently decided to delay the construction of APSF, so this SPD EIS was revised to exclude any benefit of APSF.

The location of DWPF was the major factor in the preference for SRS as the site of the immobilization facility. DOE is presently considering a replacement process for the in-tank precipitation (ITP) process at SRS. The ITP process was intended to separate soluble high-activity radionuclides (i.e., cesium, strontium, uranium, and plutonium) from liquid HLW before vitrifying the high-activity fraction of the waste in DWPF. The ITP process as presently configured cannot achieve production goals and safety requirements for

Could the Fast Flux Test Facility (FFTF) be used? The draft document evaluated FFTF as the sole venue for surplus plutonium disposition. If FFTF is used to produce tritium, plutonium could not be disposed of in the indicated timeframe. Previous reports said that FFTF could dispose of plutonium in 19 years. 32

The SRS decision for MOX fuel fabrication is based on administrative issues. Is it logical to site MOX at SRS considering the site has no previous MOX experience? 33

There are no other alternatives that also ship oxides to Hanford and the Idaho National Engineering and Environmental Laboratory (INEEL). Alternatives also did not consider a MOX-only function at FMEF. All alternatives consider the cost of creating a MOX facility with one new stand-alone facility. 34

processing HLW. Three alternative processes are being evaluated by DOE: ion exchange, small tank precipitation, and direct grout. DOE's preferred immobilization technology (can–in–canister) and immobilization site (SRS) are dependent upon DWPF providing vitrified HLW with sufficient radioactivity. DOE is confident that the technical solution will be available at SRS by using radioactive cesium from the ion exchange or small tank precipitation process. A supplemental EIS (DOE/EIS-0082-S2) on the operation of DWPF and associated ITP alternatives is being prepared.

RICHLD–32 **MOX Approach**

As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source. In December 1998, the Secretary of Energy decided that FFTF would not play a role in producing tritium.

RICHLD–33 **Alternatives**

The selection of SRS as the site of the MOX facility was not an administrative issue. As indicated in Section 1.6, SRS is preferred for the MOX facility because this activity complements existing missions and takes advantage of existing infrastructure and staff expertise. While SRS does not possess previous MOX experience, it possesses, like Hanford, a wealth of plutonium processing experience. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

RICHLD–34 **Alternatives**

Section 2.3.1 explains the development of the facility siting alternatives that were analyzed in this SPD EIS. A range of 15 reasonable alternatives remained after evaluating over 64 options against the three screening criteria, which are analyzed in the SPD Final EIS. The equally weighted criteria used were worker and public exposure to radiation, proliferation concerns due to transportation of materials, and infrastructure cost. The resulting reasonable facility and building combinations did not include those options involving shipments of oxides to Hanford and INEEL, or a MOX-only function in FMEF at Hanford because those options do not meet all the screening criteria.

Converting pits and other plutonium sources into MOX fuel is a wise use of resources; why not use all, or as much as possible, in fuel? Why immobilize any plutonium? 35

Who will operate the MOX facilities? 36

Wasn't MOX eliminated as a commercial product a number of years ago? 37

RICHLD–35 **Alternatives**

All of the surplus plutonium would not be made into MOX fuel because some of it is not suitable for fabrication due to the complexity, timing, and cost that would be involved in purifying those plutonium materials to make them suitable for use in MOX fuel. As described in this SPD EIS, DOE has identified 17 t (19 tons) of impure plutonium. Therefore, fabricating all 50 t (55 tons) of surplus plutonium into MOX fuel is not considered a reasonable alternative at this time. In order to simplify the manufacture of MOX fuel and help produce a consistent product, DOE considers it advantageous to use a feed stream consisting of only plutonium from clean metal, pits, and clean oxide. Sending the remaining materials to the immobilization facility avoids extensive characterization and purification of materials. While it is possible to use impure plutonium, the incremental burden to do so is unnecessary and complicates the MOX approach.

RICHLD–36 **MOX Approach**

DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. As discussed in the revised Section 4.28, it would be the selected team, DCS' responsibility to design, request a license, construct, operate, and deactivate the MOX facility, and to irradiate the MOX fuel in a domestic, commercial reactor. The MOX facility would be subject to DOE and NRC safety requirements.

RICHLD–37 **MOX Approach**

R&D efforts involving MOX fuel were halted in the 1970s when fuel reprocessing and breeder reactor programs were eliminated. However, these were political decisions based on proliferation concerns, and did not reflect the viability of the technologies. The use of MOX fuel as an approach to surplus plutonium disposition does not run counter to this position. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

Page 27 of the SPD Draft EIS Summary indicates that DOE plans to irradiate MOX fuel only until it reaches the Spent Fuel Standard. Some commercial companies may resist running partial rather than full fuel cycles. 38

Most utilities will argue that receiving plutonium for free alone is insufficient compensation for conducting the MOX program; utilities will want additional compensation (e.g., domestic reactors requiring highly enriched uranium that the utility had to buy). 39

Is this material [*MOX fuel*] going to go to foreign reactors? 40

RICHLD–38 **MOX Approach**

As discussed in Chapter 2 of Volume I, MOX fuel would be left in the reactor for a full cycle. Under the current reactor options, there are no plans to leave it there only long enough to meet the Spent Fuel Standard. The statement in the Draft Summary refers to an analysis from the *Storage and Disposition PEIS* that assumed MOX fuel would be removed from the reactor as soon as it had been irradiated sufficiently to meet the Spent Fuel Standard. The point being made in that PEIS was that even if this were the plan, there would still be enough space at the reactor sites to store the spent fuel until it could be sent to a potential geologic repository.

RICHLD–39 **MOX Approach**

DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. Furthermore, to ensure that taxpayers would not underwrite what might be uneconomical electricity-generating costs, DOE specifically excluded from the contract reimbursement of any costs for continuing operation of any plant unless those costs are solely and exclusively related to MOX fuel irradiation.

RICHLD–40 **MOX Approach**

This SPD EIS addresses the use of MOX fuel only in domestic, commercial reactors. In the SPD Draft EIS, DOE retained the option to use some of the surplus plutonium as MOX fuel in CANDU reactors, which would have only been undertaken in the event that a multilateral agreement were negotiated among Russia, Canada, and the United States. Since the Draft was issued, DOE determined that adequate reactor capacity is available in the United States to disposition the portion of the U.S. surplus plutonium that is suitable for MOX fuel and, therefore, while still reserving the CANDU option, DOE is no longer actively pursuing it. However, DOE, in cooperation with Canada and Russia, proposes to participate in a test and demonstration program using U.S. and Russian MOX fuel in a Canadian test reactor. A separate environmental review, the *Environmental Assessment for the Parallex Project*

Have any commercial reactors been identified by DOE? MOX fuel can be irradiated in a commercial domestic reactor (Gore/Korenko meeting). 41

Will the provider conduct the analysis for the core reactor? 42

Has DOE considered the use of existing commercial facilities such as the Siemens plant for manufacturing MOX fuel? 43

Fuel Manufacture and Shipment (DOE/EA-1216, January 1999), analyzes the fabrication and proposed shipment of MOX fuel rods for research and development activities involving the use of limited amounts of U.S. MOX fuel in a Canadian test reactor. A FONSI was signed on August 13, 1999. Both of these documents can be viewed on the MD Web site at http://www.doe-md.com. If a decision is made to dispose of Russian surplus plutonium in Canadian CANDU reactors in order to augment Russia's disposition capability, shipments of the Russian MOX fuel would take place directly between Russia and Canada.

RICHLD–41 **MOX RFP**

DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. As a result of its procurement process, DOE identified the reactors proposed to irradiate MOX fuel, Catawba, McGuire, and North Anna, as part of the proposed action in this SPD EIS. Section 4.28 was revised to discuss the potential environmental impacts of operating those reactors.

RICHLD–42 **MOX RFP**

One of the inherent responsibilities of the reactor licensee is assurance that the fuel inserted into its reactors meets all licensing requirements. This responsibility is not isolable from the reactor license. Many utilities choose to subcontract core analysis to fuel vendors, but some perform their own analyses; the decision, whether LEU or MOX fuel is involved, is the utility's alone to make.

RICHLD–43 **MOX RFP**

Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For

Time is critical for reducing weapons materials; using existing facilities [*rather than taking time to build new ones*] will reduce the timeframe for dispositioning this material. 44

Has DOE considered doing a pilot scale of plutonium conversion? Should DOE test 1-1/2 to 2 tons as a trial run? Existing Hanford facilities could be used as a pilot plant to test the process. 45

Cost was left out of the EIS. 46

reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing. Therefore, the use of the Siemens Plant approach is beyond the scope of the alternatives evaluated for this SPD EIS.

RICHLD–44 **Purpose and Need**

Although use of existing facilities might save some time in the disposition process, such facilities would still require considerable modification. Timeliness, however, is only one of many factors in decisionmaking with respect to surplus plutonium disposition. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

RICHLD–45 **Pit Disassembly and Conversion**

DOE is currently in the process of testing the plutonium conversion process as an integrated system at LANL. Up to 250 pits will be disassembled and converted to plutonium dioxide using the same techniques proposed in this SPD EIS. Details of this test may be found in the *Pit Disassembly and Conversion Demonstration EA* (DOE/EA-1207, August 1998), which is available on the MD Web site at http://www.doe-md.com. The resulting experience from this demonstration would be used to supplement information developed to support the design of the full-scale pit conversion facility should DOE decide to construct that facility. There is no need to duplicate this effort at any other DOE site.

RICHLD–46 **Cost**

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, Where are the funds for MOX coming from? 47

DOE needs to compare the cost of using existing facilities against the costs of building a new facility. I can't believe that the preferred site is cheaper than Hanford. FMEF cost $200 million to build 20 years ago. The National Academy of Sciences estimates that it will cost $500 million to $1 billion to build a new MOX facility. It would cost only $150 million to $175 million to modify the existing FMEF. Funds generated from FMEF could run FFTF to produce medical isotopes. 48

The current cost analysis is in conflict with an independent cost analysis, and this will have future ramifications. 49

November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

RICHLD–47 **Cost**

Funding for MOX fuel fabrication and the rest of the surplus plutonium disposition program comes from DOE's budget, which is authorized and appropriated by the U.S. Congress. The MOX facility would produce nuclear fuel to displace the LEU fuel that utilities otherwise would have purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

RICHLD–48 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

RICHLD–49 **Cost Report**

Because this comment relates directly to the cost analysis report, it has been forwarded to the cost analysis team for consideration. The *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

Are the United States and Russia close to a bilateral agreement on the disposition of plutonium? 50

Is the United States getting close on the Spent Fuel Standard (15 percent/240)? 51

I understand that Russia prefers to burn, not immobilize. The General Accounting Office (GAO) said the Russian mission will not fly without funding. Will the United States wait on disposition until Russia is ready to begin? 52

RICHLD–50 **Nonproliferation**

In September 1998, the United States and Russia, in a joint statement, affirmed the intention of each country to remove, by stages, approximately 50 t (55 tons) of plutonium from its stockpile and to convert this material so that it can never be used in nuclear weapons. The two countries also agreed to seek to develop appropriate international verification measures and stringent standards of physical protection, control, and accounting for the management of plutonium.

RICHLD–51 **DOE Policy**

The Spent Fuel Standard does not require a specific plutonium 240 isotopic content of 15 percent. Although isotopic dilution of the surplus plutonium resulting in a higher plutonium 240 content would support nonproliferation objectives, it is not necessarily required to make the material as inaccessible and unattractive for weapons use as the plutonium that exists in highly radioactive spent nuclear fuel from commercial reactors. Other factors considered in attaining the Spent Fuel Standard include the incorporation of physical (size and weight) and radioactive barriers to reduce the possibility of proliferation.

RICHLD–52 **Nonproliferation**

To date, Russia has not made a final decision on which disposition option it will use. DOE is working diligently to ensure that Russia continues to pursue plutonium disposition with the same vigor as the United States. Understanding the economic dilemma in Russia, the U.S. Congress has appropriated funding for a series of small-scale tests and demonstrations of plutonium disposition technologies jointly conducted by the United States and Russia. For fiscal year 1999 (starting October 1998), Congress further appropriated funding to assist Russia in design and construction of a plutonium conversion facility and a MOX fuel fabrication facility. This funding would not be expended until the presidents of both countries signed a new agreement. Although the amount appropriated by Congress is not sufficient to fund the entire Russian surplus plutonium disposition program, the United States is working with Russia and other nations to resolve this issue. The United States does not currently plan to implement a unilateral program; however, it will retain the option to begin certain surplus plutonium disposition activities in order to encourage the Russians and set an international example.

Who is funding the Russian component of the plutonium disposition process? The DOE or the G-7? 53

The largest store of weapons-grade plutonium is here at Hanford. The location of plutonium should be looked at. This was not included in the EIS. 54

Hanford was not treated fairly in the SPD EIS. Of eleven alternatives, only one considered Hanford for all three facilities, and in this one alternative (2), the MOX facility at Hanford would be a new facility, while ignoring FMEF capabilities. I feel that this is a clear example of the inherent bias reflected in the SPD EIS. Alternatives 4A and 4B calls for a new facility for MOX and immobilization, respectively. There is no case presented that allows Hanford to do more than two of three tasks, and Hanford is always required to build a new facility. 55

RICHLD–53 **Nonproliferation**

DOE is working diligently to ensure that Russia continues to pursue plutonium disposition with the same vigor as the United States. The U.S. Congress has appropriated funding for a series of small-scale tests and demonstrations of plutonium disposition technologies jointly conducted by the United States and Russia. For fiscal year 1999 (starting October 1998), Congress further appropriated funding to assist Russia in design and construction of a plutonium conversion facility and a MOX fuel fabrication facility. This funding would not be expended until the presidents of both countries signed a new agreement. Although the amount appropriated by Congress is not sufficient to fund the entire Russian surplus plutonium disposition program, the United States is working with Russia and other nations to resolve this issue.

RICHLD–54 **Transportation**

Pantex has the largest volume of surplus plutonium, in the form of pits and metal; Hanford, most of the nonpit surplus plutonium. Appendix L was revised to show the number of shipments for each alternative. Alternatives 2, 4, 6, 8, and 10 in this SPD EIS involve siting one or more of the proposed surplus plutonium disposition facilities at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

RICHLD–55 **Alternatives**

DOE acknowledges the commentor's concern regarding the development and evaluation of the surplus plutonium disposition alternatives. Section 2.3.1 explains the development of the facility siting alternatives that were analyzed in this SPD EIS. A range of 15 reasonable alternatives remained after evaluating over 64 options against the three screening criteria, which are analyzed in the SPD Final EIS. The equally weighted criteria used were worker and public exposure to radiation, proliferation concerns due to transportation of materials, and infrastructure cost. Every alternative that considered Hanford used, to

The MOX mission should be located at Hanford because Hanford has an experienced workforce with the technical skills and knowledge to perform the MOX mission. 56

The plutonium disposition mission will help to maintain a highly skilled workforce [*at Hanford*]. 57

Hanford's dry climate is better suited for conducting the MOX mission. 58

Cheap power should be considered when looking to site mission; power is much more expensive in the south. 59

the maximum extent possible, FMEF. In the case of Alternative 2, it was determined that the available space in FMEF would not be sufficient to accommodate the efficient operation and maintenance of all three proposed facilities. Therefore, the MOX facility was proposed to be located in a new building in part because, unlike the other facilities, it would be licensed by NRC.

RICHLD–56 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

RICHLD–57 **Alternatives**

DOE acknowledges the commentor's support for the surplus plutonium disposition program at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

RICHLD–58 **Alternatives**

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

RICHLD–59 **Cost**

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis*

FMEF is an ideal facility for performing the MOX mission. It is the best choice for achieving an optimal timeframe for startup. FMEF is built to NRC standards, is ready to license, is clean, and can be easily modified to meet the demands of a MOX mission. Infrastructure considerations are offered by existing facilities, FMEF, over new facilities. It makes sense to use the facility rather than walking away from it in order to build a similar facility elsewhere. The National Academy of Sciences has pointed this out. 60

DOE should apply Hanford's assets to emerging national and international needs. I would like to reemphasize the importance of plutonium disposition: it's critical to withdraw surplus plutonium from the weapons supply. The SPD EIS is an extremely important document, and it needs to be technically sound. 61

FFTF, if dedicated to the plutonium disposition mission, could dispose of the plutonium within 25 years as required while at the same time producing medical isotopes. 62

in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

RICHLD–60 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility in FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

RICHLD–61 **Alternatives**

DOE agrees with the commentor's views on the importance of plutonium disposition. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

RICHLD–62 **Alternatives**

DOE acknowledges the commentor's support for the surplus plutonium disposition program using FFTF at Hanford. As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source.

DOE should give further consideration that FFTF could handle burning 33 tons. I think that all excess plutonium could be burned and FMEF could produce MOX fuel. The taxpayers would save a lot. 63

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

RICHLD–63 **Alternatives**

DOE acknowledges the commentor's support for the surplus plutonium disposition program using FFTF and FMEF at Hanford. As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source.

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

I am concerned that with cleanup as the only mission at Hanford, it is a signal that no new missions will be given to Hanford. The plutonium disposition mission is consistent with the cleanup mission, contrary to EIS findings. Hanford can handle more than one mission at a time. 64

SRS also has an extensive cleanup mission to consider; why is DOE only penalizing Hanford and INEEL? 65

The SPD EIS misrepresents Hanford by claiming additional facility requirements while ignoring dual-mission capability, which incurs additional costs. 66

RICHLD–64 **Alternatives**

DOE acknowledges the commentor's view that the surplus plutonium disposition program is consistent with the cleanup mission. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

RICHLD–65 **Alternatives**

Cleanup is, and will remain, a priority at SRS and will be unaffected by other DOE initiatives. As indicated in the revised Section 1.6, SRS is preferred for the proposed surplus plutonium disposition facilities because the site has extensive experience with plutonium processing, and these facilities complement existing missions and take advantage of existing infrastructure.

RICHLD–66 **Alternatives**

DOE acknowledges the commentor's concern regarding DOE's assessment of Hanford's capabilities relative to the other candidate sites for the surplus plutonium disposition program. The preferred alternative was chosen based on the best information and analyses available to allow for a fair comparison among the candidate sites for the proposed surplus plutonium disposition facilities.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

What were the discriminating factors for selecting SRS? If there were no major differences in the environmental impacts at the sites, then the mission should be given to Hanford. Hanford is the most contaminated site; therefore, it should have a priority in receiving new missions. 67

DOE would be shipping out more plutonium from Hanford than it would take in if the plutonium mission were to be sited at SRS. We would be shipping more plutonium to SRS than they would be shipping here. That was left out of the EIS. 68

Locating a MOX facility at SRS requires an extra step in moving materials from Hanford to Pantex. 69

I would like to address the political side of the decision. The Northwest community sent a message to DOE during the scoping process that they expected an objective, unbiased assessment of all options and opportunities, and that the previous PEIS should not drive the current SPD EIS. The SPD EIS is not balanced and objective. Hanford deserves fair and unbiased consideration. 70

RICHLD–67 **Alternatives**

The preferred alternative was chosen based on the best information and analyses available to allow for a fair comparison among the candidate sites for the proposed surplus plutonium disposition facilities. In the case of Hanford, DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

RICHLD–68 **Transportation**

The amount of surplus plutonium at each DOE site is shown in Chapter 1 of Volume I. These amounts and locations are the starting points for determining the potential transportation impacts for each of the alternatives analyzed in this SPD EIS. Should DOE decide to implement one of these alternatives, all of the surplus plutonium at each of these sites would eventually be sent to a potential geologic repository.

RICHLD–69 **Transportation**

None of the alternatives involve moving Hanford materials to Pantex.

RICHLD–70 **General SPD EIS and NEPA Process**

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementing regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for surplus plutonium disposition facilities. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

I am disappointed in DOE's process for developing this EIS; I feel that it is a predetermined process. It could be litigated. 71

I hope DOE recognizes that there is more than one voice speaking for the Northwest. Not everyone agreed or supported the recent lawsuit, so don't hold that lawsuit against Hanford. 72

Will public comments on the cost analysis be accepted? 73

Can domestic facilities be licensed to produce MOX fuel? Will MOX be licensed by the NRC? 74

The SPD EIS added additional spent fuel difficulties (americium, high-heat levels, etc.). DOE has a questionable record when it comes to storing spent fuel. How will DOE help the sites store spent fuel? 75

RICHLD–71 **General SPD EIS and NEPA Process**

DOE prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementing regulations (40 CFR 1500 through 1508 and 10 CFR 21, respectively). Decisions on the surplus plutonium disposition program are not predetermined; they will be based on the environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

RICHLD–72 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's concern for equal representation. DOE provided opportunities and means for public comment on the surplus plutonium disposition program and gave equal consideration to all comments.

RICHLD–73 **Cost Report**

Public comments on the cost analysis are addressed in the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

RICHLD–74 **NRC Licensing**

Domestic facilities can be licensed to produce MOX fuel. Both the MOX facility and the domestic, commercial reactors selected to use the MOX fuel would be licensed and monitored by NRC.

RICHLD–75 **MOX Approach**

MOX fuel assemblies would be the same size and shape as the LEU fuel for the specific reactor. The only difference would be the additional decay heat from the higher actinides, especially americium, in the MOX fuel. Dry casks are designed and certified for a maximum heat load, so the additional decay heat would contribute to the total heat load and not require any redesign. The additional heat load may result in less spent fuel stored per cask. A more likely option is that the MOX fuel would be selectively packaged with cooler LEU fuel to obviate any overall heat output restriction.

If there are to be no new missions at the DOE Hanford facility, is DOE prepared to give up their space in the Federal Building [*in Richland*]? I suggest transitioning the Federal Building from DOE use to the City of Richland use. 76

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

RICHLD–76 **Other**

The use of the DOE space in the Federal Building is beyond the scope of this SPD EIS.

Is aqueous processing a contingency in the SPD EIS? The Weapons Monitor has criticized DOE for not considering aqueous processing. 1

The metals-only option was not evaluated. It was described by Los Alamos National Laboratory (LANL) as the most effective. 2

A significant number of pits are contaminated with tritium. Tritium-contaminated pits were not tested at Lawrence Livermore National Laboratory because of the tritium concern. Tritium issues were not addressed in the SPD EIS. 3

The SPD EIS does not cover a lot of the issues associated with pit disassembly and conversion. 4

PANTEX–1 **Plutonium Polishing and Aqueous Processing**

There are two basic technologies available for the conversion of pit plutonium into plutonium dioxide: wet (aqueous) and dry processing. DOE determined that aqueous processing, a proven technology, is not a reasonable alternative for pit conversion because current aqueous processes using existing facilities would produce significant amounts of waste, and aqueous processing would complicate international safeguard regimes. Therefore, the remaining technology, dry processing, was analyzed in the *Storage and Disposition PEIS* and this SPD EIS. DOE is currently demonstrating the dry plutonium conversion process as an integrated system at LANL. This activity is described in the *Pit Disassembly and Conversion Demonstration EA* (DOE/EA-1207, August 1998), which is available on the MD Web site at http://www.doe-md.com.

PANTEX–2 **Alternatives**

The metals-only option would convert the plutonium from pits into metal for long-term storage. This option was not evaluated in this SPD EIS because it does not render the plutonium proliferation-resistant. Immobilizing the plutonium or converting it to MOX fuel and then irradiating the fuel would meet the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

PANTEX–3 **Alternatives**

Section 2.4.1.2 was revised to include a discussion of tritium-contaminated pits.

PANTEX–4 **Pit Disassembly and Conversion**

DOE acknowledges the commentor’s concern that not all issues associated with the pit disassembly and conversion process are addressed in this SPD EIS. This EIS reflects a thorough analysis of impacts, including air quality, human health risk, waste management, and socioeconomics, that would be associated with the siting of a pit conversion facility at either Hanford, INEEL, Pantex, or SRS. Also evaluated were impacts on other resources (i.e., geology and

I want a more in-depth discussion of risks associated with the plutonium and tritium mission. 5

soils, water resources, ecological resources, cultural and paleontological resources, land use and visual resources, and infrastructure), but only in terms of the alternative that would have the greatest impact on the resource. The alternative analyzed was generally that which would involve locating the largest number of facilities at a given site. Impact analyses are summarized in Chapter 4 of Volume I. More detailed information on the pit disassembly and conversion process is included in the data reports for each candidate site referenced in this EIS. These references can be obtained from local DOE reading rooms.

DOE's *Pit Disassembly and Conversion Demonstration EA* (DOE/EA-1207, August 1998) analyzes the environmental impacts of a demonstration to test an integrated pit disassembly and conversion process on a relatively small sample of plutonium pits and metals at LANL. The information gathered in that demonstration will be used to supplement information developed to support the construction of a full-scale pit conversion facility, if DOE decides to build such a facility. The demonstration focuses on equipment design and process development. Since it could continue for up to 4 years, information transfer conducive to fine-tuning the operational parameters of a pit conversion facility could be provided continually throughout the facility design phase. The EA is available on the MD Web site at http://www.doe-md.com.

PANTEX–5 **Human Health Risk**

This SPD EIS identifies and analyzes potential human health impacts that might result from construction and normal operation of the proposed surplus plutonium disposition facilities. The Human Health Risk and Facility Accidents sections in Chapter 4 of Volume I discuss the effects on the public of potential radiological releases. DOE policy places public safety above other program goals, and requirements have been established to protect the safety and health of the public. DOE considers the protection of the public against accidents in the design, location, construction, and operation of its facilities.

The tritium mission is beyond the scope of this EIS. The *Final Programmatic Environmental Impact Statement for Tritium Supply and Recycling* (DOE/EIS-0161, October 1995) evaluates alternatives for new tritium production and for the recycling of tritium recovered from weapons retired from service.

The No Action Alternative is not a viable alternative because the half-life of plutonium is 20,000 years. The No Action Alternative leaves the material in a form that invites terrorism and environmental problems; we should not leave these issues for future generations. 6

Pit disassembly and conversion should be kept separate from MOX and immobilization to be able to have accountability for Russian plutonium disposal. 7

DOE should dismantle weapons materials as soon as possible by moving forward with the pit disassembly and conversion mission. 8

PANTEX–6 **Alternatives**

DOE acknowledges the commentor's opposition to implementing the No Action Alternative. Analysis of the No Action Alternative is required under NEPA. Section 2.5 indicates that the No Action Alternative would not satisfy the purpose and need for the proposed action because DOE's disposition decisions in the *Storage and Disposition PEIS* ROD would not be implemented. As indicated in Section 1.6, DOE has identified as its preferred alternative the hybrid approach (i.e. immobilization and MOX) to disposition surplus plutonium.

PANTEX–7 **Nonproliferation**

The United States and Russia recently made progress in the management and disposition of plutonium. In late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile. Because each country is responsible for separately disposing of its own stockpiles of surplus plutonium, this agreement contains provisions for developing verification methods and technology. These include appropriate international verification measures and stringent standards of physical protection, control, and accounting for the management of plutonium. IAEA is charged with verifying compliance with international nonproliferation policies. As discussed in Section 2.4, there are provisions for international inspections of each of the proposed surplus plutonium disposition facilities.

PANTEX–8 **Pit Disassembly and Conversion**

DOE acknowledges the commentor's support for pit disassembly and conversion. DOE plans to move ahead with the surplus plutonium disposition program as expeditiously as possible. However, the proposed surplus plutonium disposition facilities would not be constructed until significant progress was made by the Russian government on its plutonium disposition program. Schedules for construction and operation of the proposed facilities are provided in Appendix E.

There is political controversy surrounding the MOX option. I believe the MOX option will fade as more is analyzed and understood about the materials. 9

The pit disassembly and conversion mission should go to an established site. 10

Technology for converting pits into an oxide form has not been demonstrated; DOE is getting ahead of itself. 11

The nuclear community indicated at a meeting in Atlanta, Georgia, that it does not trust the ARIES process for oxide. DOE, however, amended the RFP to allow the ARIES process. 12

PANTEX–9 MOX Approach

DOE acknowledges the commentor's opinion regarding the MOX approach.

PANTEX–10 Alternatives

DOE acknowledges the commentor's opinion that the pit conversion facility should be located at an established site. As indicated in the revised Section 1.6, SRS is preferred for the pit conversion facility because the site has extensive experience with plutonium processing, and the pit conversion facility complements existing missions and takes advantage of existing infrastructure. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–11 Pit Disassembly and Conversion

The process that will be used to convert the plutonium in pits to an oxide is not new; each step has been successfully demonstrated. For the proposed action, however, those steps would be linked for the first time as a full-scale, integrated process. DOE's *Pit Disassembly and Conversion Demonstration EA* (DOE/EA-1207, August 1998) analyzes the environmental impacts of a demonstration to test an integrated pit disassembly and conversion process on a relatively small sample of plutonium pits and metals at LANL. The information gathered in that demonstration will be used to supplement information developed to support the construction of a full-scale pit conversion facility, if DOE decides to build such a facility. The demonstration focuses on equipment design and process development. Since it could continue for up to 4 years, information transfer conducive to fine-tuning the operational parameters of a pit conversion facility could be provided continually throughout the facility design phase. The EA is available on the MD Web site at http://www.doe-md.com.

PANTEX–12 Alternatives

The ARIES process is one of the pit conversion process steps, in which the pits are disassembled and the plutonium is separated from other pit components and converted into plutonium dioxide. The scope of work reflected in the *RFP for MOX Fuel Fabrication and Reactor Irradiation*

Both the ARIES and MOX processes were evaluated in the Independent Risk Study. Based on my background, the data presented is current, relevant, and accurate. 13

Can DOE say with certainty that it is cheaper to build and operate facilities at SRS than at Pantex? 14

The American Federation of Labor-Congress of Industrial Organizations (AFL-CIO) has a strong working relationship with DOE and has met with past Secretaries to develop programs to reduce costs that resulted in a savings of $50 million for taxpayers. The AFL-CIO is actively working to seek out ways for improving cost efficiency in workforce practices. 15

Services (May 1998) would begin after the production of plutonium dioxide. Because there was some discussion that the resulting plutonium might contain too much gallium to meet the MOX fuel specifications, the RFP was amended to allow the offerors to propose an additional polishing step for gallium removal.

PANTEX–13 Alternatives

DOE acknowledges the commentor’s conclusion that the data in the Independent Risk Study is current, relevant, and accurate.

PANTEX–14 Cost

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PANTEX–15 Cost

DOE acknowledges the commentor’s support for siting the proposed surplus plutonium disposition facilities at Pantex. Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and

Clarification of the cost report is needed. Some of the pit disassembly and conversion facility needs for SRS are being rolled into the design changes for the APSF and are not being reflected in the cost estimates. The need for a source calibration facility is also not covered. The indirect cost factors are not covered. 16

I am pleased that Laura Holgate is stepping in to head up the plutonium disposition mission, which is an international issue as well as a national concern. As the National Academy of Sciences stated, surplus plutonium represents a clear and present danger. The United States needs to demonstrate leadership and technology for Russia. 17

Engaging Russia has the added benefit of reaching and leading a broader international audience in dispositioning surplus weapons materials. A bilateral agreement is being negotiated with Russia for inspecting nonclassified material. Involving the international community opens up opportunities for transparency. 18

Washington, D.C. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–16 **Cost Report**

Because this comment relates directly to the cost analysis report, it has been forwarded to the cost analysis team for consideration. The *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PANTEX–17 **DOE Policy**

DOE acknowledges the commentor's support for the leadership of the surplus plutonium disposition program. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

PANTEX–18 **DOE Policy**

DOE agrees that close cooperation between the United States and Russia is essential to achieve the objectives of nonproliferation and arms reduction, and to ensure secure management of nuclear weapons materials. To that end, in late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. During

The pit disassembly and conversion mission is a huge decision for the nation. Components of the mission must be handled with care. DOE needs to move forward in demilitarizing the pits and moving the material into safe and secure storage ultimately under the purview of International Atomic Energy Agency inspection and control. DOE needs to demonstrate a leadership roleCthis opens up a lot of opportunity for transparency and knowing what is going on in both Russia and the United States. 19

I don't believe we need to tear down so many weapons. I believe we need to keep our big stick; I hope we never have to use it. Slow down the dismantlement of weapons, and use caution in tearing down military resources that may be needed in the future. 20

We urge you not to let political urgency influence the decision made to house and dilute these plutonium pits. We urge you to select Pantex. 21

the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile. One of the seven principles that were agreed upon relates to acceptable methods and technology for transparency measures, including appropriate international verification measures and stringent standards of physical protection, control, and accounting for management of the plutonium.

PANTEX–19 **DOE Policy**

DOE agrees that bilateral monitoring with Russia of the classified plutonium material and international inspection of the unclassified material would give assurances to the world of U.S. leadership in plutonium disposition. Once the United States and Russia completed an agreement providing the basis for exchanging classified nuclear information, the procedures to be used for inspection of pits in storage could be adapted to contribute to the bilateral monitoring of pit conversion facilities. As shown in Figure 2–7, accommodation for international inspection of the unclassified material has been incorporated into the design of the pit conversion facility. International monitoring and inspection of the unclassified plutonium would also allow the United States and Russia to demonstrate to each other and to the world that disposition is being carried out under stringent nonproliferation controls, and that the excess plutonium is not being diverted for reuse in weapons.

PANTEX–20 **DOE Policy**

DOE acknowledges the commentor's view regarding national defense. Declaration of surplus weapons is made by the President in response to recommendations from the Nuclear Weapons Council, which consists of representatives from DOE, DoD, and the Joint Chiefs of Staff.

PANTEX–21 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

Let Pantex's excellent track record speak for itself; we are the obvious choice. 22

The disposition of pits can be done in the most timely fashion at Pantex. Pantex's current capabilities will allow the United States to achieve some high-level goals, accelerate timeliness, and offers opportunity for inspection and collaboration with Russia. 23

Amarillo supports Pantex for the new pit disassembly and conversion mission. Keep the work at Pantex. Pantex has a highly trained workforce capable of meeting the pit disassembly and conversion mission. Pantex has one of the best safety records in the DOE complex and rarely has off-normal or unusual occurrences. There is a strong health program at Pantex. DOE orders are followed strictly, and Pantex's workforce is healthier and safer than Savannah River's workforce. 24

Pantex is a secure location. Pits are already located at Pantex, which is a strong argument for siting the pit disassembly and conversion facility at Pantex. Performing the pit disassembly and conversion mission at Pantex lessens the risk of nuclear proliferation. 25

Pantex plays an important role in the local community; the community is allowed to participate in environmental safety and health oversight. There is a strong spirit of community cooperation and support for the Pantex site, including the Amarillo business community. 26

PANTEX–22 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–23 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–24 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–25 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–26 **Other**

DOE acknowledges the strong community support for Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on public input, environmental analyses, technical and cost reports, and national policy and nonproliferation considerations.

Texas has a long and healthy relationship in working with DOE and the Federal Government to meet defense needs. The State of Texas support along with the support of the AFL-CIO is a powerful ally for the Department. It makes no sense to do the work any place else. 27

The support for Pantex is localized; the rural community is historically less supportive of Pantex. 28

The Stockpile Stewardship and Management PEIS states that plutonium won't be introduced into sites that don't have the infrastructure. Pantex does not have the capability to handle TRU (transuranic) waste and tritium. Why is it being considered? 29

PANTEX–27 **Other**

DOE acknowledges the support of the State of Texas and the AFL-CIO. Decisions on the surplus plutonium disposition program at Pantex will be based on public input, environmental analyses, technical and cost reports, and national policy and nonproliferation considerations.

PANTEX–28 **Other**

DOE acknowledges the commentor's observation that Pantex support is localized and that the rural community has historically been less supportive.

PANTEX–29 **Alternatives**

The *Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management* (SSM PEIS) (DOE/EIS-0236, September 1996) states that the pit fabrication mission would not be introduced into a site that does not have an existing plutonium infrastructure because of the high cost of new plutonium facilities and the complexity of introducing plutonium operations into sites without current plutonium capabilities. The SSM PEIS states further that an important element of the site selection strategy is to maximize the use of existing infrastructure and facilities as the nuclear weapons complex becomes smaller and more efficient in the 21st century; thus, no new facilities were to be built to accommodate stockpile management missions. Accordingly, DOE considered as reasonable only those sites with existing infrastructure capable of supporting a pit fabrication mission. Although Pantex has the infrastructure to carry out its current weapons assembly and disassembly mission and nonintrusive pit reuse program, it was not considered a viable alternative for the pit fabrication mission because it did not possess sufficient capability and infrastructure to meet the SSM PEIS siting assumption stated above. Among the operations that were considered in developing siting alternatives for pit fabrication in the SSM PEIS were plutonium foundry and mechanical processes, including casting, shaping, machining, and bonding; a plutonium-processing capability for extracting and purifying plutonium to a reusable form either from pits or residues; and assembly operations involving seal welding and postassembly processing.

When comparing the site selection strategy for pit disassembly and conversion with that used for the pit fabrication mission, the siting criteria in the SSM PEIS

Tritium in the pits made them too dangerous to handle and test at Los Alamos; why is it any safer to perform pit conversion at Pantex? 30

Siting the pit disassembly and conversion mission at Pantex will be creating a new plutonium-contaminated site. 31

have little or no bearing on siting criteria used in this SPD EIS. Pit disassembly and conversion do not require foundry and mechanical processes discussed in the SSM PEIS and can be accomplished in a stand-alone facility. Also, the SSM PEIS siting assumptions include a requirement to use existing facilities, whereas the pit conversion facility would be a new structure no matter where it is located.

Pantex is a candidate site because it meets the three screening criteria: worker and public exposure to radiation, proliferation concerns due to transportation of materials, and infrastructure cost. In addition, Pantex is a candidate site for the pit conversion facility because most of the pits are stored there. Although TRU waste is not routinely generated and stored at Pantex, dedicated storage space would be provided with the proposed surplus plutonium disposition facilities.

PANTEX–30 **Pit Disassembly and Conversion**

Pits containing tritium are routinely processed in the Special Recovery Line at LANL. Removal of the tritium is a rather straightforward process and can be performed safely. Pits with tritium contamination are bisected to separate the plutonium from the classified metal shapes, and then processed in a vacuum furnace to drive off the tritium, as described in Section 2.4.1. This same process would be applied in the pit conversion facility.

PANTEX–31 **Alternatives**

DOE acknowledges the commentor's opposition to siting the pit conversion facility at Pantex. This SPD EIS identifies and analyzes potential environmental and human health impacts that might result from the construction and normal operation of the proposed surplus plutonium disposition facilities. As described in Chapter 4 of Volume I and summarized in Section 2.18, potential impacts of any of the proposed actions during routine operations at any of the candidate sites would likely be minor. To avoid contamination that has occurred in the past at some DOE sites, DOE would design, build, and operate the proposed surplus plutonium disposition facilities in compliance with today's environmental, safety, and health requirements. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

Promised site safety upgrades [*at Pantex*] have not happened; the effects are being realized in Zone 4 where pits had to be moved. Last month the pits were moved because of the heat. We shouldn't be playing musical bunkers. We would take a dim view of Russia if they started moving their pits around. 32

Pantex is not a clean site; it has its problems. More study is needed before introducing plutonium processing into the Amarillo area. Amarillo will become no different than any other DOE site if plutonium processing comes to the area. 33

The GAO is investigating pit storage at Pantex. There is no plan for long-term storage at Pantex; we're still waiting on the plan. 34

PANTEX–32 **Storage and Disposition PEIS and ROD**

The ROD for the *Storage and Disposition PEIS* presents the long-term storage plan for plutonium pits at Pantex. DOE is committed to the safe, secure storage of pits and is evaluating options for upgrades to Pantex Zone 4 facilities to address plutonium storage requirements. Further, DOE has prepared an environmental review concerning the repackaging of Pantex pits into a more robust container. This evaluation is documented in the *Supplement Analysis for: Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components—AL–R8 Sealed Insert Container* (August 1998). This document is on the MD Web site at http://www.doe-md.com.

PANTEX–33 **Alternatives**

DOE acknowledges the commentor's concerns about siting any proposed surplus plutonium disposition facility at Pantex. This SPD EIS identifies and analyzes potential environmental and human health impacts that might result from the construction and normal operation of the proposed facilities. As described in Chapter 4 of Volume I and summarized in Section 2.18, potential impacts of any of the proposed actions during routine operations at any of the candidate sites would likely be minor. To avoid contamination that has occurred in the past at some DOE sites, DOE would design, build, and operate the proposed surplus plutonium disposition facilities in compliance with today's environmental, safety, and health requirements. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–34 **DOE Policy**

The ROD for the *Storage and Disposition PEIS* presents the long-term storage plan for plutonium pits at Pantex. DOE is committed to the safe, secure storage of pits and is evaluating options for upgrades to Pantex Zone 4 facilities to address plutonium storage requirements. DOE has addressed some of the commentor's concerns in an environmental review

I want to ask about the differences in occurrence reporting between Pantex and SRS. Pantex has fewer employees than SRS. How many more employees does SRS have? What processing does SRS do? 37

SRS does not have the type of enhanced safety programs in place that Pantex has. 38

SRS has limited experience in handling pits. 39

conversion process that has been proposed for all candidate sites. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–37 **Socioeconomics**

At the time the SPD Draft EIS was prepared in 1997, SRS employed 15,032 persons and Pantex, 2,944.

Currently, SRS processes nuclear materials into forms suitable for continued safe storage, use, or transportation to other DOE sites. Tritium is recycled at SRS in support of stockpile requirements using retired weapons as the tritium supply source. In the past, DOE produced nuclear materials and tritium at SRS.

PANTEX–38 **Alternatives**

All of the candidate sites considered for the surplus plutonium disposition program have safety programs in place that would meet the needs of the proposed activities; site capabilities in this area were not a discriminator in the process of selecting the preferred alternative. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–39 **Alternatives**

As indicated in the revised Section 1.6, SRS is preferred for the pit conversion facility because the site has extensive experience with plutonium processing, and the pit conversion facility complements existing missions and takes advantage of existing infrastructure. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

The decision for MOX at SRS should be reassessed. 40

Negative impacts (economic) can wipe out any gains in nonrelated areas. If Pantex fails to grow, it will be like taking two steps backward. 41

I am encouraged that there are no discriminating impacts between the sites. 42

The Independent Risk Assessment Study's preliminary findings show that risks from the new mission are comparable to existing missions at Pantex. The Independent Risk Assessment Study stated that risks can be mediated by the type of facility built. A person would receive a higher dose taking an airplane ride than from the 1,100 curies of tritium that would be released each year from the new pit disassembly and conversion mission at Pantex. 43

PANTEX–40 **Alternatives**

As indicated in Section 1.6, SRS is preferred for the MOX facility because this activity complements existing missions and takes advantage of existing infrastructure and staff expertise. The preferred alternative was chosen based on the best information and analyses available to allow for a fair comparison among the candidate sites for the proposed surplus plutonium disposition facilities. This is DOE's preference; it is not a decision. Decisions on the surplus plutonium disposition program at SRS will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–41 **Socioeconomics**

DOE acknowledges the commentor's support for growth at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–42 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's observation that there is no fundamental distinction between the candidate sites in terms of environmental impacts of the surplus plutonium disposition program.

PANTEX–43 **Human Health Risk**

DOE acknowledges the commentor's statement of fact. In particular, the dose of 0.062 mrem/yr to the maximally exposed member of the public from the release of 1,100 Ci of tritium from a new pit conversion facility at Pantex (see Table 4–66) would be 40 times smaller than the dose of 2.5 mrem received by a person during a 5-hr airplane ride across the United States (*Ionizing Radiation Exposure of the Population of the United States* [NCRP Report No. 93, September 1987]).

I am a Risk Study participant. The numbers are stacking up against the SPD EIS. I do not believe that the facilities required for the pit disassembly and conversion mission would impact the site; impacts will occur from added waste streams. 44

I am not hearing anything in the meeting about health, and impacts to the environment are being dismissed. Plutonium disposition is a long-term decision. DOE needs to consider the long-term health effects for the children and the children's children. I am concerned about the plutonium disposition mission's effect on water and land; we need only look to Oak Ridge to see the long-term effects. 45

PANTEX–44 **Waste Management**

DOE acknowledges the commentor's concerns regarding the impacts of waste that would be generated by a pit conversion facility at Pantex. As described in Section 4.6.2.2, the impacts of operation of the pit conversion facility on the waste management infrastructure at Pantex would likely be minor. Even the 180 m^3 (235 yd^3) of TRU waste, a new waste type for Pantex, could be stored within the new pit conversion facility, and therefore would likely have minor impacts on the waste management infrastructure.

PANTEX–45 **Human Health Risk**

Analyses in Chapter 4 of Volume I indicate that impacts of operating the proposed surplus plutonium disposition facilities on human health and the environment at Pantex would likely be minor. Section 4.26.3.2 analyzes impacts to the environment due to construction and normal operation of a pit conversion facility at Pantex. There would be no discernible contamination of aquatic biota (fish) or drinking water resulting from the proposed surplus plutonium disposition facilities at Pantex, either from minute quantities of air deposition into small water bodies or from any potential wastewater releases. Therefore, it is estimated that no measurable component of the public dose would be attributable to liquid pathways.

As described in Appendix J.3.1.3, ingestion doses at Pantex were assessed for eight different food categories: leafy vegetables, root vegetables, fruits, grains, milk, meat, poultry, and eggs. Public doses incurred from the uptake of these foodstuffs were determined to be well below Federal, State, and local regulatory limits; therefore, potential radiological impacts to local prime farmlands would be essentially nonexistent.

Appendix J.3.2.3.2 includes an analysis of potential contamination of agricultural products and livestock and consumption of these products by persons living within an 80-km (50-mi) radius of Pantex. If the proposed facilities were located at Pantex, a very small incremental annual dose to the surrounding public from normal operations would result via radiological emission deposition on agricultural products (i.e., food ingestion pathway). This dose (about 0.56 person-rem/yr) would be 0.0006 percent of the dose that would be incurred annually from natural background radiation.

The SPD EIS does not address all environmental impacts. The SPD EIS fails to adequately address air emissions (beryllium, americium, tritium, etc.). 46

The risk estimators used to convert doses to fatal cancers (see Appendixes F.10.2 and K.1.4.3) project LCF risks over the full lifetime of people exposed to radiation. These risk estimators factor in the presence of children in the general population. Results of the assessments indicate no LCFs among the public and about two among the workforce.

Risk estimators have also been developed to predict severe hereditary effects (e.g., mental retardation) (*1990 Recommendations of the International Commission on Radiological Protection*, [ICRP Publication 60, November 1991]). As these risk estimators are much smaller than those for fatal cancers (i.e., only about 20 to 26 percent of the values), severe hereditary effects would not be expected among the progeny of members of the public or workers exposed to radiation.

Long-term effects on the health of people living in the vicinity of ORR are addressed in Section 3.6.9 of the *Storage and Disposition PEIS.* The health effects studies discussed in that Section yielded no statistically significant evidence of excess cancer risk.

PANTEX–46 **Human Health Risk**

Chapter 4 of Volume I addresses the potential environmental impacts of implementation of the surplus plutonium disposition alternatives. Included are detailed assessments of air quality and noise, waste management, socioeconomics, human health, facility accidents, transportation, and environmental justice.

The radiological and chemical releases associated with each alternative, and the resulting environmental impacts, have been subjected to detailed assessment. Appendixes J.1.1.4, J.2.1.4, J.3.1.4, and J.4.1.4 present the annual rates of radiological releases to the environment for Hanford, INEEL, Pantex, and SRS, respectively. The releases include isotopes of uranium, americium, and plutonium, and for the pit conversion facility, these three plus tritium. There would be no releases of beryllium. Numerous tables in Appendix G present the amounts of chemicals that would be released annually to the air environment.

All four sites could stand a better crop and livestock analysis. Pantex is the only site without a river. Contamination pathways were not evaluated enough except for direct ingestion. 47

I am concerned about aquifer and environmental contamination, and the impacts to rural families and the environment from Pantex operations. 48

Impacts of air emissions are also presented in Chapter 4 of Volume I. For radiological releases, the doses and resulting health effects (i.e., LCFs) are given. For chemical releases, increases in air concentrations are listed for criteria air pollutants, other regulated pollutants, and hazardous and other toxic compounds, and these concentrations are compared with the applicable standards or guidelines.

PANTEX–47 Human Health Risk

As described in the Agricultural Data sections of Appendix J, agricultural Census food production data established via DOC were used in the radiological dose assessments for this SPD EIS. Ingestion doses were assessed for eight different food categories for Hanford, INEEL, and Pantex: leafy vegetables, root vegetables, fruits, grains, meat (livestock), poultry, milk, and eggs; for SRS, three additional consumable categories were assessed: fish, shellfish, and drinking water. Analysis of per-county production provided for a high degree of accuracy in the assessment of dose via the ingestion pathway.

The analyses in Appendix J consider the potential contamination of agricultural products and livestock, and consumption of these products by persons living within an 80-km (50-mi) radius of the candidate sites. The analyses of doses consider bioaccumulation of radioactivity in grain crops, forage, and animals (and the resultant effects on ingestion doses to humans), and all potential dose pathways including direct ingestion, inhalation, external ground exposure, and plume immersion. These analyses indicate that the potential impacts of operation of the pit conversion, immobilization, and MOX facilities on agricultural products, livestock, and human health at any of the sites would likely be minor.

Releases of radioactivity from the proposed facilities at each candidate site to the food production chain are discussed in Appendixes J and K. Section 4.26 and Appendix K were revised to discuss potential impacts of radioactive emissions on agriculture and water resources.

PANTEX–48 Human Health Risk

Analyses in Chapter 4 of Volume I indicate that impacts of operating the proposed surplus plutonium disposition facilities on human health and the environment at Pantex would likely be minor. Section 4.26.3.2 analyzes impacts

DOE needs to consider the risks to agriculture. Radioactive materials have no place in an agricultural community. Risk and public perception of tainted agricultural products must be considered. 49

to the environment due to construction and normal operation of a pit conversion facility at Pantex. There would be no discernible contamination of aquatic biota (fish) or drinking water resulting from the proposed surplus plutonium disposition facilities at Pantex, either from minute quantities of air deposition into small water bodies or from any potential wastewater releases. Therefore, it is estimated that no measurable component of the public dose would be attributable to liquid pathways.

As described in Appendix J.3.1.3, ingestion doses at Pantex were assessed for eight different food categories: leafy vegetables, root vegetables, fruits, grains, milk, meat, poultry, and eggs. Public doses incurred from the uptake of these foodstuffs were determined to be well below Federal, State, and local regulatory limits; therefore, potential radiological impacts to local prime farmlands would be essentially nonexistent.

Appendix J.3 includes an analysis of potential contamination of agricultural products and livestock and consumption of these products by persons living within an 80-km (50-mi) radius of Pantex. If the proposed facilities were located at Pantex, a very small incremental annual dose to the surrounding public from normal operations would result via radiological emission deposition on agricultural products (i.e., food ingestion pathway). This dose (about 0.56 person-rem/yr) would be 0.0006 percent of the dose that would be incurred annually from natural background radiation.

PANTEX–49 **Human Health Risk**

As described in Appendix J.3.1.3, agricultural Census food production data established via DOC were used in the radiological dose assessments for this SPD EIS. These data were separated into eight individual categories: leafy vegetables, root vegetables, fruits, grains, beef (livestock), poultry, milk, and eggs. Analysis of per-county production provided for a high degree of accuracy in the assessment of dose via the ingestion pathway. According to the Chapter 4 (Volume I) data on radiological dosage, which includes a component from contaminated food, the highest potential dose to the public residing within 80 km (50 mi) of Pantex is 0.59 person-rem/yr. This is 170,000 times lower than the annual population dose from natural background radiation.

I own about 1,000 acres adjacent and west of Pantex. I farm about 2,500 acres south of Pantex. We have proof that the water wells on the farm are contaminated with tritium. 50

The National Farm Bureau and the Grange oppose reprocessing MOX fuel in agricultural areas where it can pollute the air, water, or land. 51

Although public perceptions with regard to human health risk are not discussed directly in this EIS, comparisons with reference standards help put the potential radiological impacts into perspective. For example, comparisons with natural background radiation doses and normal cancer incidence (i.e., 0.2 percent) in the general population are presented in Chapter 3 of Volume I.

PANTEX–50 **Water Resources**

DOE acknowledges the commentor's concerns regarding groundwater contamination at Pantex. The impact of existing contamination at Pantex is beyond the scope of this SPD EIS. This comment was referred to the appropriate site personnel. As discussed in Section 4.26.3.2.2, there would be no discernible impacts on surface water or groundwater quality from operation of the proposed surplus plutonium disposition facilities. Other sections show, moreover, that the operation of these facilities would likely have only minor impacts on human health, agriculture, and livestock: Section 4.17.2.4 addresses the potential radiological and hazardous chemical effects of the maximum-impact alternative on the public and workers at Pantex; Appendix J.3.1.3, the potential contamination of agricultural products and livestock, and consumption of these products by persons living within an 80-km (50-mi) radius of Pantex.

PANTEX–51 **Alternatives**

DOE acknowledges the commentor's opposition to siting the MOX facility at Pantex. Section 4.17 describes the potential effects of the proposed surplus plutonium disposition facilities on air quality at Pantex. Sections 4.26.3.1 and 4.26.3.2 analyze the potential impact on soil and water due to construction and normal operation of the proposed facilities at Pantex. There would be no discernible contamination of aquatic biota (fish) or drinking water, either from the deposition of minute quantities of airborne contaminants into small water bodies or from potential wastewater releases. Therefore, it is estimated that no measurable component of the public dose would be attributable to liquid pathways.

As described in Appendix J.3.1.3, ingestion doses at Pantex were assessed for eight different food categories: leafy vegetables, root vegetables, fruits, grains, milk, meat, poultry, and eggs. Public doses incurred from the uptake

Data in the Pantex Site-Wide EIS is faulty and flawed. The former Site-Wide EIS overestimates the probability of an air crash. Air crashes raise the risks at Pantex. Crash data should be reassessed and reanalyzed for more realistic crash data. Do not use crash data as an excuse not to site the pit disassembly and conversion mission at Pantex. 52

All but Pantex have elevated risks from transportation crash scenarios. What data was used to calculate the transportation data? 53

of these foodstuffs were determined to be well below Federal, State, and local regulatory limits; therefore, potential radiological impacts to local prime farmlands would be essentially nonexistent.

Appendix J.3 includes an analysis of potential contamination of agricultural products and livestock and consumption of these products by persons living within an 80-km (50-mi) radius of Pantex. If the proposed facilities were located at Pantex, a very small incremental annual dose to the surrounding public from normal operations would result via radiological emission deposition on agricultural products (i.e., food ingestion pathway). This dose (about 0.56 person-rem/yr) would be 0.0006 percent of the dose that would be incurred annually from natural background radiation.

PANTEX–52 **Facility Accidents**

This aircraft crash evaluation involved the use of the operations data from the *Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components* (DOE/EIS-0225, November 1996) because they are the best available data at this time. The data were used in accordance with *Accident Analysis for Aircraft Crash Into Hazardous Facilities* (DOE-STD-3014-96, October 1996). Estimated frequencies, consequences, and risks related to aircraft crashes depend on a number of factors, such as building size and shape; building robustness; and the quantity, material form, and containment characteristics of the hazardous material. As a result, the overall aircraft crash frequencies reported in this SPD EIS are lower than those reported in the Pantex EIS. The decision as to where to site the pit conversion facility will not be based on exclusively on aircraft crash frequency. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–53 **Transportation**

Accident data from *Longitudinal Review of State-Level Accident Statistics for Carriers of Intrastate Freight* (ANL/ESD/TM-68, March 1994), was used to estimate accident frequencies. This document is based on DOT accident data. Several DOE sources, shown in the Appendix L reference list, were

There are less risks associated in transporting pits than in transporting the entire weapon. 54

Transportation of the pits is not trivial and will slow down the demilitarization process of the pits. 55

I only see money and politics in the room. Many of the people at the meeting are paid to attend–DOE should listen to those not being paid. 56

I know that plutonium disposition decisions will be political, and I believe that these decisions have already been made. 57

used to estimate SST/SGT accident frequencies. As indicated in Section 2.18, no traffic fatalities from nonradiological accidents or LCFs from radiological exposures or vehicle emissions are expected.

PANTEX–54 Transportation

DOE acknowledges the commentor's concerns about transportation risks. However, the transportation of nuclear weapons is beyond the scope of this SPD EIS.

PANTEX–55 Transportation

DOE has a very safe record in transporting plutonium pits, and has transported pits around the DOE complex throughout the Cold War. As indicated in Section 2.18, no traffic fatalities from nonradiological accidents or LCFs from radiological exposure or vehicle emissions are expected. DOE's experience and current planning analyses indicate that the transportation of pits can be carried out for each of the alternatives in this SPD EIS in the time required.

PANTEX–56 General SPD EIS and NEPA Process

The comment period for the SPD Draft EIS extended from July 17 through September 16, 1998. During that time, DOE convened five public hearings to obtain oral and written comments from the public. These hearings were open to all individuals and organizations, and their format was intended to encourage public discussion and interaction, regardless of the motivation for attending the hearing.

PANTEX–57 General SPD EIS and NEPA Process

DOE has not made any decision on the siting of the proposed surplus plutonium disposition facilities. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for the proposed facilities. In accordance with CEQ implementing regulations (40 CFR 1502.14(e)), DOE identified its preferred alternative in the SPD Draft EIS. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

I see DOE's logic in the SPD Draft EIS Summary, and I appreciate the extent of work put into the SPD EIS. 58

The Pantex Citizens Advisory Board is a consensus board; no consensus has been reached on plutonium. 59

The MOX option decision is being commercially driven, and the affected communities are not being heard. DOE is not following NEPA process in selecting reactors. It is allowing vendors to submit bids without holding hearings at reactor sites. 60

PANTEX–58 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's views on the preparation and logic of this SPD EIS.

PANTEX–59 **Other**

DOE acknowledges the commentor's observation that the Pantex Citizens Advisory Board has not reached a consensus on plutonium.

PANTEX–60 **MOX RFP**

The SPD Final EIS was not issued until specific reactors had been identified and the public had an opportunity to comment on the reactor-specific information. As part of the procurement process, bidders were asked to provide environmental information to support their proposals. This information was analyzed in an Environmental Critique prepared for the DOE source selection board prior to award of the MOX fuel fabrication and irradiation services contract. DOE then prepared an Environmental Synopsis on the basis of the Environmental Critique, which was released to the public as Appendix P of the *Supplement to the SPD Draft EIS* in April 1999.

A hearing was held in Washington, D.C. on specific reactor information. After careful consideration of its public involvement opportunities, including information availability and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement*. DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of a South Carolina State Senator, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representiatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

The SPD EIS falls short, and should be reevaluated. The SPD EIS is not a legally valid document and is a total corruption of the spirit and legal letter of the law. It needs to be legally defensible. 61

Land was taken from the family for the Pantex Plant. It is disheartening to see that only 80 percent of Amarillo supports Pantex. Everyone should support weapons dismantlement. 62

A meeting on the SPD EIS is not a pep rally for Pantex and against SRS; the meeting is about the document. 63

Some comments here today are embarrassing. Much of the research is based on hysteria. I support the risks characterized in the document. My goal is to have more people better informed. 64

The Union cannot continue going to the Hill with DOE to request funding when DOE isn't making smart decisions. Labor backs friends and could hurt enemies. Right now DOE is a friend, don't become an enemy. 65

The Pantex Site-Wide EIS was completed before the DOE Standard [*aircraft crash analysis*]. This leaves little opportunity for input to the standard. 66

I see a certain synergism between different levels of the plutonium disposition mission. To what extent has the synergism of the mission been considered related to repackaging the pits? 67

PANTEX–61 General SPD EIS and NEPA Process

DOE acknowledges the commentor's views on the legality of this SPD EIS. DOE has prepared the EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementing regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively).

PANTEX–62 Alternatives

DOE acknowledges the commentor's support for Pantex and the weapons dismantlement missions. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–63 General SPD EIS and NEPA Process

DOE acknowledges the commentor's views.

PANTEX–64 Other

DOE acknowledges the commentor's goal to have more people better informed.

PANTEX–65 DOE Policy

Separate cost and schedule analyses have been performed and documented, and testing to demonstrate technical feasibility of the various alternatives is under way. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–66 DOE Policy

DOE acknowledges the commentor's concern regarding public input on DOE's standard involving aircraft crash analyses. Since this issue is beyond the scope of this SPD EIS, the comment has been referred to the DOE Amarillo Area Office.

PANTEX–67 DOE Policy

Repackaging the pits would allow for safe long-term storage, handling, and shipment of the pits for disposition. Therefore, repackaging would facilitate

Pit location should not be factored into the final disposition decision. Pit assembly skills are not the same as those required for pit disassembly and conversion. The distinction is being blurred. 68

Has there been a decision on form or output of pit conversion? What is the product from pit disassembly and conversion? 69

I worked at Los Alamos in the MOX fuel and ARIES programs. Both the ARIES and MOX processes were evaluated in the Independent Risk Study. Based on my background, the data is current, relevant, and accurate. 70

How long does it take to turn a single pit into MOX fuel? How long will it take to have the facility up and running? 71

safe transport of the pits to the pit conversion facility, and would reduce the risk of unnecessary exposure to workers associated with facility operation.

PANTEX–68 **Alternatives**

DOE acknowledges the commentor's concern regarding the distinction between skills required for pit assembly and those required for pit disassembly and conversion. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–69 **Pit Disassembly and Conversion**

Plutonium metal extracted from disassembled pits would be converted to an oxide powder. The powder from various pits would be blended to ensure the final powder is unclassified and homogeneous. This process would produce plutonium dioxide that is suitable for immobilization or fabrication into MOX fuel. This blended powder would be seal-welded into stainless steel cans. A description of the pit conversion process is given in Section 2.4.1.2.

PANTEX–70 **Alternatives**

DOE acknowledges the commentor's claim that the ARIES and MOX processes were evaluated in the Independent Risk Study.

PANTEX–71 **MOX Approach**

Given processing directly from start to finish, a pit could be converted into MOX fuel in 1 day. However, the process occurs in steps; a single pit would not likely go through the system directly from start to finish. Several runs of plutonium dioxide product from the pit conversion facility would likely be mixed to ensure consistency of feed to the MOX facility. Moreover, time would be required for international inspection, and for transfer to the MOX facility. Production schedules would also dictate the length of time that either a given pit, its plutonium, or the oxide could remain at the pit conversion facility between process steps.

Section 2.4.1.2 describes the pit disassembly and conversion process, and Section 2.4.3.2, the MOX fuel fabrication process. Appendix E provides schedules for construction and operation of the surplus plutonium disposition facilities. According to estimates, approximately 6 years would be required, MOX and ARIES processes are not magic; they can be easily understood. 72

Were the canyon facilities at SRS considered to conduct the polishing process if needed? 73

If the plutonium disposition decision were based solely on cost, then the decision would be full immobilization. It would save on conversion, MOX fuel burn, and final storage factors. 74

start to finish, for activation of a MOX facility. Specific activities during that period would include selection of the MOX team, contract negotiations, facility design, licensing, construction, and startup.

PANTEX–72 **Alternatives**

DOE acknowledges the commentor's claim that the ARIES and MOX processes can be easily understood.

PANTEX–73 **Alternatives**

Use of the canyons for plutonium dioxide polishing to remove gallium was not considered for the following reasons: DOE has committed to closing the canyons prior to the completion of the surplus plutonium disposition program; the canyons are currently planned for other missions (e.g., processing of RFETS plutonium residues and scrub alloy) and could not be readily retrofitted for the plutonium polishing process until after that mission was complete; the cost of maintaining the canyons would increase due to the new mission and necessary safety upgrades; and use of the canyons would increase worker exposures.

PANTEX–74 **Cost**

As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach, which includes both immobilization and MOX fuel, would be more expensive than the immobilization-only approach. However, pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs

The 1997 S&D PEIS selected Pantex for long-term storage; this was also mentioned in the Pantex Site-Wide EIS. Seventy million dollars were added to the budget for repackaging. The government is double billing $70 million for repackaging to move pits off the site. Can you explain this? 75

Collateral effects–would additional needs be addressed? Will additional costs be considered for moving pits offsite? Was ALARA (as low as is reasonably achievable) factored into the cost estimate? 76

associated with the various alternatives. The cost report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–75 **DOE Policy**

The ROD for the *Storage and Disposition PEIS* identified Pantex as the storage site for plutonium pits pending disposition. Pits are currently stored in containers that are not suitable for long-term storage or transportation. Therefore, repackaging is necessary to ensure safe storage for up to 50 years. Should the decision be made to transport the pits offsite, the pits would have to be repackaged in a suitable shipping container. DOE has addressed some of the commentor's concerns in an environmental review concerning the repackaging of Pantex pits into a more robust container. This evaluation is documented in the *Supplement Analysis for: Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components—AL–R8 Sealed Insert Container* (August 1998). This document is on the MD Web site at http://www.doe-md.com. Based on this supplement analysis, the decision was made to repackage pits at Pantex into the AL–R8 sealed insert container and to discontinue plans to repackage pits into the AT–400A container.

PANTEX–76 **Cost**

Because cost issues are beyond the scope of this EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

I would like to understand the cost of containers and transportation. 77

Explain how the value of residual/ongoing cleanup at SRS is factored into costs. Overhead rates are dependent on overall activity at sites, not just on one project. 78

Explain how SRS is more cost effective than Pantex if the cost estimate is statistically identical. 79

PANTEX–77 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. For a better understanding of cost and transportation issues, consult the following reports: *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD–0009, July 1998), *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), and *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98–8244, June 1998). These documents are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PANTEX–78 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PANTEX–79 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

Sites are not identical. One site appears to have the advantage. Look at existing facilities at the sites and what is available. There are labor uncertainties in the cost. The difference in cost at SRS is not a significant discriminator. 80

I am concerned about the moving design of APSF and the moving design of the pit disassembly and conversion facility at SRS. I am concerned that design change costs are not being rolled into the overall costs and how these costs are considered in the cost report. 81

Five years ago, questions were raised to DOE regarding pit storage. The storage decision would presuppose decision on final disposition. DOE needs to honor its 5-year commitment made through the S&D PEIS process. Pit location should not be factored into the final decision process. 82

PANTEX–80 **Cost**

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–81 **Cost Report**

Because this comment relates directly to the cost analysis report, it has been forwarded to the cost analysis team for consideration. The *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PANTEX–82 **DOE Policy**

The ROD for the *Storage and Disposition PEIS* presents the long-term storage plan for plutonium pits at Pantex. DOE is committed to the safe, secure storage of pits and is evaluating options for upgrades to Pantex Zone 4 facilities to address plutonium storage requirements. DOE has prepared an environmental review concerning the repackaging of Pantex pits into a more robust container. This evaluation is documented in the *Supplement Analysis for: Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components—*

The timetable for MOX production could be delayed for years over political controversy regarding our national policy toward nuclear energy. 83

AL–R8 Sealed Insert Container (August 1998). This document is on the MD Web site at http://www.doe-md.com. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–83 **DOE Policy**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. Toward that end, DOE conducted a procurement process in accordance with DOE NEPA regulations 10 CFR 1021.216. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process.

A limited number of MOX fuel assemblies would be irradiated and tested in accordance with NRC requirements to verify acceptability prior to fabricating the fuel on a larger scale for insertion into the reactors. The recently enacted legislation, National Defense Authorization Act for Fiscal year 1999, provided NRC the authority to license the MOX facility. Therefore, NRC will also license the MOX facility under 10 CFR 70, and be responsible for issuing operating license amendments under 10 CFR 50 for the domestic, commercial reactors that have been selected to irradiate the MOX fuel. There are always uncertainties involved with construction projects and startup of new facilities and processes. DOE understands that DCS would have to apply for a reactor operating license amendment for each individual reactor before it can use MOX fuel and what that process entails, including the public involvement opportunities provided by NRC per 10 CFR 50.91. DOE is conducting regular meetings with NRC on the MOX approach, including fuel design and qualification. Although no substantive design work or construction can be started on the MOX facility until a decision is made in the SPD EIS ROD, DCS would work closely with NRC to ensure that the license amendment process can be accomplished in a timely manner. If the decision is to proceed with MOX fuel fabrication, construction of the MOX facility would begin in 2002.

Concerning the timeliness of this with the Russians, what is the overlay of this with other DOE missions? 84

An accident at the British Nuclear Fuels MOX demonstration plant required 73 people to be evacuated. It's only a 5-year-old facility. The accident demonstrates that other countries are having problems with MOX, and DOE is not listening to them. The decisions made here are international in scope, and we are asking for the people to hear from people in Europe and Russia. 85

If there is an accident, will DOE compensate those landowners with property contaminated by the accident? Fernald, Hanford, and Rocky Flats landowners have never been compensated. Where should landowners go if their land is contaminated by DOE? 86

PANTEX–84 **DOE Policy**

The United States will continue to work with Russia along agreed paths and schedules for plutonium disposition, and DOE's surplus plutonium disposition program will proceed accordingly. The proposed plutonium disposition actions will be coordinated with other ongoing DOE programs. Section 1.8 discusses the relationship of this program with other proposed or ongoing actions and programs.

PANTEX–85 **Facility Accidents**

The MOX facility would be designed in accordance with all applicable requirements and standards to ensure the health and safety of workers and the public and protection of the environment. The design team would review and consider, as appropriate, information that may be available about similar facilities to ensure that the MOX facility met applicable requirements and that the design incorporated the newest technologies and benefits from previous experience. The MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

PANTEX–86 **DOE Policy**

Should there be an accident involving nuclear materials, compensation would be determined according to the provisions of the Price-Anderson Act. The purpose of this act is to indemnify contractors responsible for managing and conducting nuclear activities within the DOE complex. An extension, the Price-Anderson Amendments Act of 1988, requires mandatory coverage of all contractors, subcontractors, and suppliers conducting nuclear activities for DOE, and, in compliance with a congressional mandate, enforcement action by DOE against indemnified contractors for violations of nuclear safety requirements.

Sixty-five percent of the scientists and engineers in Amarillo work at Pantex; the community relies on Pantex to provide a science and engineering base for education. When looking at the importance of science and engineering, especially when compared to other sites, it is important to Pantex to keep a science and engineering base in Amarillo. 87

Pit disassembly and conversion should be performed at Pantex. No significant additional training is needed for the committed and skilled workforce at Pantex. Pantex has the best training program to bring its workforce up to speed to meet the new mission. The site operates in full compliance with DOE orders. There is 100 percent literacy among the Pantex workforce. 88

State and local organizations support siting a new plutonium disposition mission at Pantex. 89

Industries contribute to the quality of life in the Panhandle. I see environmental concerns that citizens voluntarily respond to. It is not in the best interest of the United States to ship the pit disassembly and conversion mission offsite. 90

PANTEX–87 **Socioeconomics**

DOE acknowledges the community support of Pantex and the importance of science and engineering education. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–88 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–89 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–90 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

Work would be done safely and professionally, and the environment would be protected if the pit disassembly and conversion mission is sited at Pantex. 91

I have worked at Pantex for 7 years. If the site wasn't safe, I wouldn't work there. I feel safer at Pantex than on the street and I believe DOE's culture is changing. 92

I am not concerned about or believe that information is being withheld from workers. Added knowledge leads to improvements. All questions ever asked at Pantex have been answered. I trust Pantex management to be open and honest with the workforce. 93

I am proud of the work performed at Pantex. A quality assurance process is in place to make sure Pantex meets quality standards. As a union steward, it's my job to ensure continuing job performance and excellence. 94

Pantex employs 2,500 Hispanic and other minority employees. 95

With all the research facilities located at Pantex, it should be the site chosen for MOX fuel fabrication. 96

PANTEX–91 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–92 **Other**

DOE acknowledges the commentor's support of Pantex and of the change in DOE culture to put safety first. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–93 **Other**

DOE acknowledges the commentor's support of Pantex and the open lines of communication. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–94 **Other**

DOE acknowledges the commentor's support of Pantex and its quality assurance achievements. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–95 **Other**

DOE acknowledges the commentor's support of diversity in the workplace.

PANTEX–96 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

The International Guards Union supports bringing the pit disassembly and conversion mission to Pantex. A new mission is needed to keep a qualified workforce in the area. The site has a highly trained and skilled security force and an excellent safety record. 97

Storage infrastructure is already in place at Pantex. 98

I understand a great deal about land stewardship. I was formerly a farmer, and am now a hazmat (hazardous materials) worker at Pantex. I believe that general industry is much worse than anything I've seen at Pantex. Agriculture has messed up more as a land steward than DOE. 99

It's of paramount importance to dismantle weapons. The first stage of weapons production (assembly) was performed at Pantex. The second stage of weapons production (disassembly and conversion) should also be performed at Pantex. 100

Pantex has worn out its welcome. Job security is nice, but the plant is coming to the end of its usefulness. Pantex should accept the unacceptable. 101

PANTEX–97 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–98 **Alternatives**

Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–99 **Alternatives**

DOE acknowledges the commentor's support of Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–100 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–101 **Alternatives**

DOE acknowledges the commentor's opposition to new missions at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

I lived in Hereford, Texas, when Texas was considered for the repository project. I believe that DOE sees people as expendable and was more concerned about where to locate the repository than it was about the impacts on people. This community should not trade safety for jobs. 102

The argument being presented is that since the materials are at Pantex, the pit disassembly and conversion mission should reside there as well. The truth is that 12 metric tons of plutonium residing at Rocky Flats will be shipped with this mission. Weren't concerns raised about plutonium from Rocky Flats being shipped before the decision was issued? Plutonium processing is what messed up Rocky Flats. 103

Pantex's ongoing mission will last anywhere from 10 to 12 years. Pantex does its job admirable, but it should never process plutonium. 104

I am a former Washington resident. My husband died because of living near and working at Hanford. I hope that Pantex does not become like Hanford. Pantex is safe, and I hope that it stays that way. 105

PANTEX–102 **Alternatives**

DOE acknowledges the commentor's opposition to siting the proposed surplus plutonium disposition facilities at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–103 **Transportation**

DOE acknowledges the commentor's concerns about the shipment of surplus plutonium from RFETS to Pantex and the processing of that material at Pantex. The decision to ship surplus pits from RFETS to Pantex is stipulated in the ROD for the *Storage and Disposition PEIS*. The shipment of pits from RFETS to Pantex supports the DOE commitment to close RFETS. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–104 **Alternatives**

DOE acknowledges the commentor's opposition to siting the proposed surplus plutonium disposition facilities at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–105 **Human Health Risk**

DOE acknowledges the commentor's concern for the safety of workers and persons living near Pantex. This SPD EIS identifies and analyzes potential environmental and human health impacts that might result from the construction and normal operation of the proposed surplus plutonium

SRS workers are experts at processing plutonium; Pantex workers are experts in pit disassembly and conversion. 106

SRS experience in processing plutonium is long past. 107

If the plutonium mission is so dangerous, why does SRS want it so bad? SRS is no smarter or dumber than Pantex. 108

disposition facilities at the candidate sites. As described in Chapter 4 of Volume I and summarized in Section 2.18, these potential impacts would likely be minor. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–106 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–107 **Alternatives**

DOE acknowledges the commentor's opposition to siting the proposed surplus plutonium disposition facilities at SRS. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–108 **Human Health Risk**

As described in Chapter 4 of Volume I, potential impacts of alternatives for surplus plutonium disposition would likely be minor. In addition, analyses of design-basis accidents showed that no LCFs to the population would be expected from operation of the proposed surplus plutonium disposition facilities at any of the candidate sites. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

The public has an inalienable right to know impacts and hazards of site operations. Workers know hazards, the community should also know hazards. 109

If contamination poses a health risk, how much damage to health occurs due to stress from job loss? 110

It seems that every facility processing plutonium has either been contaminated or had an accident. Has there ever been an instance while processing plutonium where a facility hasn't been contaminated? 111

PANTEX–109 — General SPD EIS and NEPA Process

DOE acknowledges the need of the public to be informed about the potential impacts and hazards of the ongoing and prospective work at DOE sites. The SPD Draft EIS was merely one step in the public information process. It included information on potential accidents, types and levels of waste to be generated, and a number of other environmental impacts. After its publication, the public was accorded the opportunity to comment on any aspect of DOE's proposed action to disposition up to 50 t (55 tons) of surplus plutonium.

In compliance with existing laws and regulations, DOE provides information on site-specific hazards of ongoing operations other than the surplus plutonium disposition program in various documents, including site-specific NEPA documents, annual site-specific environmental reports, reports of chemical discharges, and reports of chemical use and storage.

PANTEX–110 — Socioeconomics

DOE acknowledges the commentor's concern about job loss. The socioeconomics analyses do not specifically evaluate the health effects resulting from the stress of losing a job. As part of its Strategic Alignment Initiative and restructuring of the nuclear weapons complex, however, DOE has put in place several programs to assist its employees in finding new jobs. Decisions on the surplus plutonium disposition program will be based on environmental analyses (including analyses of socioeconomics), technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PANTEX–111 — DOE Policy

It is true that plutonium-processing facilities could experience contamination. The proposed surplus plutonium disposition facilities would be designed, constructed, operated, and deactivated in accordance with applicable Federal, State, and local environmental, safety, and health requirements. Within these limits, DOE believes that contamination levels should be kept as low as is reasonably achievable, taking into account social, technical, economic, practical, and public policy considerations. Worker safety is also a major consideration in construction and operation of the proposed facilities, and safety assessment (including accident analysis) is an integral part of the design process.

Plutonium processing may result in higher radiation releases than the area is accustomed to. Tritium releases are 10,000 times higher in processing than in pit assembly. 112

Exposure rates are much higher in other countries than the United States. We need to put doses into perspective. 113

PANTEX–112 **Human Health Risk**

The bounding alternative for Pantex would be siting the pit conversion and MOX facilities at Pantex. About 0.000104 Ci/yr of plutonium and americium and 1,100 Ci/yr of tritium, total, would be released to the atmosphere from these facilities. In 1996, the airborne releases from Pantex operations were 1.6×10^{-17} Ci of thorium 232, 0.000146 Ci of uranium 238, and 0.103 Ci of tritium (*1996 Environmental Report for Pantex Plant*, [DOE/AL/65030-9704, May 1997]). While the commentor is correct in stating that plutonium processing would result in radiation releases greater than those from current operations, including a tritium release 10,000 times greater, the doses and resulting adverse health effects associated with the increased releases would be very small. The dose to the MEI from these facilities would be increased by 0.068 mrem/yr, and the dose to the population living within 80 km (50 mi) of Pantex in the year 2010 would be increased by 0.59 person-rem/yr. For 10 years of operation, the increased risk of an LCF to the MEI would be 3.4×10^{-7}, and the increased number of LCFs to the 80-km (50-mi) population would be 0.003.

PANTEX–113 **Human Health Risk**

The various U.S. agencies (DOE, EPA, and NRC) involved in promulgating dose limits have established strict limits for workers and the public (see Appendix F.10.2). In addition, operators of nuclear facilities must demonstrate that all operations are conducted in a manner that further reduces doses to ALARA levels. The combination of strict enforcement of dose limits and adherence to the ALARA operational philosophy ensures that exposure rates from nuclear operations in the United States are generally maintained below those in other countries with nuclear programs.

Specific comparisons with exposures in other countries are not given in this SPD EIS. These comparisons would be difficult to make, given the large number of countries involved; they are not really necessary, anyway, because demonstrating compliance with U.S. requirements ensures small risks of adverse health effects. Doses associated with facilities assessed in this EIS are put into perspective through comparison with U.S. requirements and natural background radiation levels.

What are the current emissions in curies of tritium from Pantex? 114

DOE needs to resolve uncertainties before decisions are made. Internal radiation effects from plutonium inhalation are severe. More data is needed on exposure risks. Does the plutonium dose estimate include internal? Studies of health effects are never revealed. 115

PANTEX–114 **Human Health Risk**

Emissions of tritium to the environment from Pantex operations are included in the annual environmental reports. The latest report available is for operations in 1996 (*Environmental Report for Pantex Plant,* [DOE/AL/65030-9704, May 1997]). It is reported in Table 6.1 of that document that 0.103 Ci of tritium was released to the air environment.

PANTEX–115 **Human Health Risk**

The Human Health Risk sections in Chapter 4 of Volume I present the results of detailed assessments of health impacts on the public and onsite workers. Doses to the public from both normal operations and postulated accidents were calculated using models accepted within the scientific community. While uncertainties are typical of such assessments, the use of the GENII computer code for the evaluation of normal operations (see Appendix F) and the MACCS2 code for accidents (see Appendix K), along with best estimates of input parameters (e.g., radiation source terms, meteorological conditions, population distributions, agricultural production), yielded results that are expected to be as accurate as possible. If anything, they would be on the conservative side; that is, the doses would be overestimated. These doses were converted into LCFs using the risk estimators derived from data prepared by the National Research Council's Committee on the Biological Effects of Ionizing Radiation and by the International Commission on Radiological Protection, as discussed in Appendixes F.10.2 and K.1.4.3.

For workers, the doses from normal operations were taken from data reports prepared for each facility assessed in this SPD EIS. The reports for Hanford, INEEL, Pantex, and SRS are identified in Appendixes J.1.1.4, J.2.1.4, J.3.1.4, and J.4.1.4, respectively. The worker doses from accidents were calculated by the GENII computer code using the source terms from the same data reports. Those doses were converted into LCFs using somewhat lower risk estimators than those for the public to reflect the absence of children in the workforce (see Appendixes F.10.2 and K.1.4.3).

Also calculated were the plutonium and americium doses delivered via all potential dose pathways. For the public, the dominant pathways would be inhalation and ingestion, which result in internal doses only. Worker doses

I have severe doubts about DOE's commitment to 100 percent noncontamination. DOE has a poor track record in protecting the environment. Every DOE site except Pantex has been contaminated by DOE operations. 116

I understand Pantex's need for new missions, but I'm unconvinced that DOE has changed. I have heard stories from retired workers and of workers being exposed without fully knowing the associated risks. I see money with the new mission, but no assurance for safety. I am frightened by the implication of a plutonium processing mission. I don't see any definitive answers in the SPD EIS; what should have been researched and analyzed wasn't. 117

DOE should make use of LANL resources. As a former LANL worker, I was never concerned for personal safety because of the plutonium processing mission. If I thought plutonium processing could hurt Pantex, I would actively oppose the mission, but that's not the case. 118

from normal operations would be mainly from external exposure to gamma rays emitted from the plutonium and americium radionuclides; accidental doses would be attributable mainly to inhalation.

Health effects studies conducted in and around Hanford, INEEL, Pantex, and SRS are discussed in Sections 3.2.4.3, 3.3.4.3, 3.4.4.3, and 3.5.4.3, respectively.

PANTEX–116 **DOE Policy**

DOE acknowledges the commentor’s concern regarding contamination of the environment. The proposed surplus plutonium disposition facilities would be designed, constructed, operated, and deactivated in accordance with applicable Federal, State, and local environmental, safety, and health requirements. Within these limits, DOE believes that the level of contamination should be kept as low as is reasonably achievable, so that the benefit of reducing the already low level of contamination would warrant the additional cost of that reduction. Chapter 5 summarizes the applicable environmental statutes, regulations, and permits that cover emissions, waste, and ALARA standards.

PANTEX–117 **DOE Policy**

DOE acknowledges the commentor’s concern regarding worker safety during surplus plutonium disposition activities at Pantex. The analyses conducted for this SPD EIS indicate potential environmental and human health impacts would likely be minor at Pantex. Results of the analyses are presented by alternative in Chapter 4 of Volume I. Detailed information on the potential impacts on human health at Pantex is presented in Appendix J.3. As shown in these sections, operation of the proposed facilities at Pantex would be well within the limits prescribed by Federal, State, and local laws and regulations.

PANTEX–118 **Human Health Risk**

DOE acknowledges the commentor’s support of LANL and Pantex. Both LANL and Pantex staff have assisted in the development of information and analyses to support the surplus plutonium disposition program. Appendix J.3 describes the results of the human health risk analyses for Pantex. Potential impacts of construction and operation at Pantex would likely be minor and within the limits prescribed all applicable Federal, State, and local laws and regulations.

We have plutonium in the country, in Texas, and at Pantex. We have it and need to do something with it. DOE needs to establish priorities, design a process that allows no releases, engineer controls to ensure the process, and enhance personal protective equipment. 119

The accelerator mission to produce tritium at SRS would cause SRS to exceed water limits. Has the Department considered the cumulative impacts of this mission along with the accelerated tritium mission at SRS? 120

Beryllium is an extremely hazardous substance to some people and can cause berylliosis. DOE has known about this problem for 30 years. STAND submitted 21 pages of questions asking for definitions and doses. What is the range of doses to personnel? It's 60 percent higher in LANL documents for personnel doses in plutonium processing facilities than estimated for the proposed facilities. 121

PANTEX–119 **Human Health Risk**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. DOE has identified as its preferred alternative the hybrid approach (immobilization and MOX fuel fabrication) to disposition surplus plutonium. Selection of that alternative would provide for processing that could be conducted in such a manner as to minimize impacts on the environment. Although a goal of no releases of radioactivity to the environment would be unattainable, the proposed surplus plutonium disposition facilities would be designed and operated as appropriate to maintain ALARA releases. Engineered controls, the use of remote equipment and other effective design features, and strict adherence to operational procedures would ensure that operations are conducted safely, and efficiently, and thus would likely have minor impacts on workers and the public.

PANTEX–120 **Water Resources**

In a ROD published in the Federal Register on May 18, 1999 (64 FR 26369), DOE decided not to construct an accelerator at SRS. Therefore, Section 4.32.4.1 of this SPD EIS was revised to remove the large amount of water that would be used by an accelerator. Accordingly, as indicated in Table 4–248, cumulative water usage falls well within the capacity of the SRS potable water system.

PANTEX–121 **Human Health Risk**

The 1994 analysis performed by LANL referred to the possibility of airborne releases of beryllium, a hazardous air pollutant, from pit disassembly and conversion. Subsequent analysis from LANL indicates that there would not be any airborne releases of beryllium *(Pit Disassembly and Conversion Facility, Environmental Impact Statement Data Report—Pantex Plant* [LA-UR-97-2909, June 1998]). Because the beryllium is expected to remain in metal form at all times, the health hazards are minimized. The beryllium would be present in large pieces and cuttings created when the pit was bisected. These cuttings would be too large to become airborne. There would be no grinding; thus, there would not be any pieces of beryllium small enough to become airborne. Section 2.4.1 was revised to include a discussion of beryllium as a potential impurity, as well as the reasons why beryllium processing would not be an issue at the pit conversion facility.

Modern day standards are a result of years of caution in handling nuclear materials. Industrial, commercial safety devices and standards are a result of DOE operations. Public benefits are not always linked to DOE. A better understanding of health effects was learned through DOE. The berylliosis information came from commercial industries (aerospace, etc.). 122

No one has any answers about what is going on in the environment or with health issues. 123

Nuclear power plants are primarily located in the east, so it's cheaper to transport from SRS. 124

More transportation increases risks and the possibility of proliferation. 125

PANTEX–122 **Other**

DOE acknowledges the commentor's observation that DOE and commercial industries have contributed to the development of health and safety standards, procedures, and devices.

PANTEX–123 **General SPD EIS and NEPA Process**

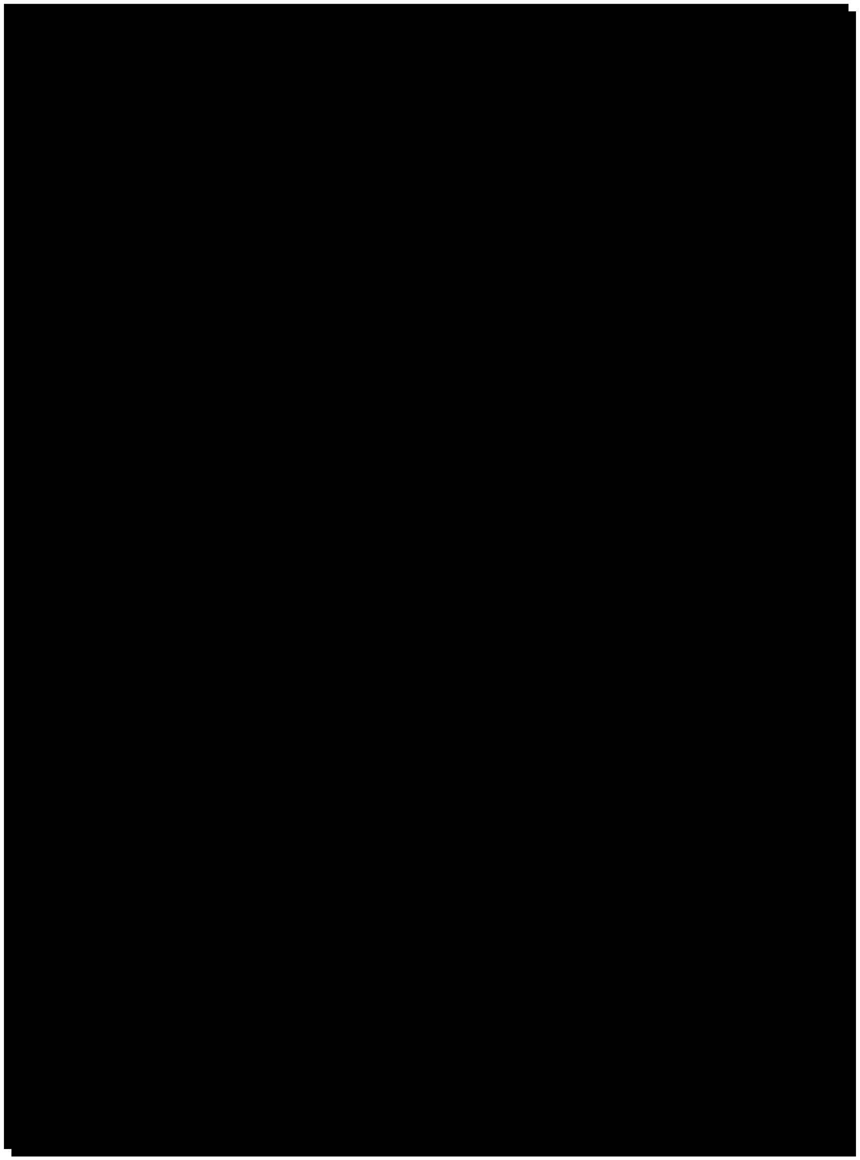
DOE acknowledges the commentor's environmental and health-related concerns. This SPD EIS was prepared to provide a comprehensive description of proposed actions and their potential environmental impacts of the surplus plutonium disposition program. DOE believes that all activities that are part of the proposed action and alternatives are analyzed adequately in this SPD EIS. As described in Chapter 4 of Volume I and summarized in Section 2.18, potential impacts of construction and operation of the proposed surplus plutonium disposition facilities would likely be minor.

PANTEX–124 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PANTEX–125 **Transportation**

DOE acknowledges the commentor's concern that more transportation increases the risks of proliferation. In order to address security against terrorist-related incidents, all intersite shipments of plutonium for the surplus plutonium disposition program would be made using DOE's SST/SGT system. This involves having couriers that are armed Federal officers, an armored tractor to protect the crew from attack, and specially designed escort vehicles containing advanced communications and additional couriers. Further, the DOE disposition facilities proposed in this SPD EIS are all at locations where



plutonium would have the levels of protection and control required by applicable DOE safeguards and security directives. Safeguards and security programs would be integrated programs of physical protection, information security, nuclear material control and accountability, and personnel assurance. Security for the Pantex facilities would be implemented commensurate with the usability of the material in a nuclear weapon or improvised nuclear device. Physical barriers; access control systems; detection and alarm systems; procedures, including the two-person rule (which requires at least two people to be present when working with special nuclear materials in the facility); and personnel security measures, including security clearance investigations and access authorization levels, would be used to ensure that special nuclear materials stored and processed inside are adequately protected. Closed-circuit television, intrusion detection, motion detection, and other automated materials-monitoring methods would be employed. Furthermore, the physical protection, safeguards, and security for the MOX facility and domestic,

I am proud that diverse ideologies can come together in turning swords to plowshares. The plutonium disposition mission is critical to the nation wherever it is performed. 139

Pantex workers have reported that there are 10 weapons pits missing. I would like the issue looked into and security tightened at the site. 140

DOE stated that packaging would be redone by 2000. Twenty pits were to be repackaged suitable for shipping last year. Is other shipping being evaluated? 141

Was a NEPA action performed for onsite storage? When will the supplemental analysis be released for public review? 142

Will there be long-term storage in Zone 4? 143

information was analyzed in an Environmental Critique prepared for the DOE source selection board prior to award of the MOX fuel fabrication and irradiation services contract. DOE then prepared an Environmental Synopsis on the basis of the Environmental Critique, which was released to the public as Appendix P of the *Supplement to the SPD Draft EIS* in April 1999.

PANTEX–139 Alternatives

DOE acknowledges the commentor's support for the surplus plutonium disposition program. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PANTEX–140 DOE Policy

DOE acknowledges the commentor's concern regarding management of pits at Pantex. Since this issue is beyond the scope of this SPD EIS, the comment has been referred to the DOE Amarillo Area Office.

PANTEX–141 DOE Policy

DOE acknowledges the commentor's question regarding management of pits at Pantex. Since this issue is beyond the scope of this SPD EIS, the comment has been referred to the DOE Amarillo Area Office.

PANTEX–142 DOE Policy

Onsite storage of plutonium pits at Pantex is analyzed in the *Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components* (DOE/EIS-0225, November 1996), and in the *Supplement Analysis for: Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components—AL–R8 Sealed Insert Container* (August 1998). The latter document is available on the MD Web site at http://www.doe-md.com.

PANTEX–143 DOE Policy

The ROD for the *Storage and Disposition PEIS* presents the long-term storage plan for plutonium pits at Pantex. Storage facilities in Zone 12 South will be upgraded by 2004 to store, pending disposition, the surplus pits currently stored at Pantex, and surplus pits from RFETS. Storage facilities in Zone 4 will continue to be used for these pits prior to completion of the upgrade.

DOE should release court records on the man who died of leukemia in 1982. 144

I have worked in the oil and gas industry for 18 years. Competition is good for business. Nuclear competition is healthy for oil and gas. 145

PANTEX–144 **DOE Policy**

This issue is unrelated to the surplus plutonium disposition program and is beyond the scope of this SPD EIS.

PANTEX–145 **Other**

DOE acknowledges the commentor's support of competition.

What is the definition of a preferred alternative? Has there ever been an instance of a preferred alternative changing? 1

Full immobilization is the best option for DOE. There is no need for a pure level of plutonium. Immobilization requires fewer facilities, plutonium travels less, there is less of a security risk, and there are fewer high-level-waste impacts. DOE will not have to deal with licensing resistance from communities. 2

AIKEN–1 **General SPD EIS and NEPA Process**

A preferred alternative is the alternative that an agency believes best accomplishes the proposed action, giving consideration to environmental, technical, economic, and other information available at the time. In accordance with CEQ implementing regulations (40 CFR 1502.14(e)), the agency shall identify its preferred alternative or alternatives, if one or more exists, in the draft EIS and must identify one in the final EIS. While DOE has identified its preferences in this SPD EIS, it is open to any new information that may become available and will use this information in making a decision, which will be published in a ROD. There have been instances in which a preferred alternative was changed in the period between the draft to final versions of an EIS, and others in which a preferred alternative was not chosen in the ROD. For example, the preferred alternative in the *Shutdown of the River Water System at the Savannah River Site* was to shut down the system; however, the No Action Alternative was chosen in the ROD.

AIKEN–2 **Alternatives**

DOE acknowledges the commentor’s support for the immobilization-only approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia’s excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Transportation would be required for both the immobilization and MOX approaches to surplus plutonium disposition. Transportation of special nuclear materials, including fresh MOX fuel, would use DOE’s SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material. The

I am concerned about the last six alternatives for immobilizing plutonium. Plutonium is a national resource and treasure. Fifty metric tons of weapons-grade plutonium is the equivalent of 200 million metric tons of coal at $150 per metric ton. Fifty metric tons of plutonium is worth about $29.5 billion. Fifty metric tons of plutonium can provide enough electricity to power three counties for 50 years. Do not immobilize plutonium that could be used for nuclear power. 3

transportation requirements for the surplus plutonium disposition program are also evaluated in this SPD EIS.

DOE has a classified design basis threat document for guidance in the design, construction, and evaluation of all security systems associated with the proposed surplus plutonium disposition facilities. That document was prepared in coordination with the law enforcement agencies (Federal, State, and local) and the intelligence community, and is reviewed periodically to ensure currency with emerging threats. Current DOE safeguards and security orders would also be used in the design, construction, and evaluation of the security systems.

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

AIKEN–3 **Alternatives**

DOE acknowledges the commentor's concern regarding the market value of surplus plutonium. The purpose of the MOX approach is not to generate electricity, but to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

DOE reviewed the chemical and isotopic composition of the surplus plutonium and determined in the *Storage and Disposition PEIS* ROD that about 8 t (9 tons) of surplus plutonium were not suitable for use in making MOX fuel. Furthermore, DOE has identified an additional 9 t (10 tons) for a total of 17 t (19 tons) that have such a variety of chemical and isotopic compositions that it is more reasonable to immobilize these materials and avert the processing complexity that would be added if these materials were made into MOX fuel. The criteria used in this identification included the level of impurities, processing requirements, and the ability to meet the MOX fuel specifications.

MOX experience is untried; weapons-grade plutonium has never been used in commercial reactors. Weapons materials increase the wear and tear on commercial reactors and needs to be addressed. 4

I am concerned about the reprocessing of MOX fuel. DOE should fully expand nonreactor options to dispose of plutonium. Communities will cry nix MOX and will not support MOX. 5

AIKEN–4 **MOX Approach**

Although no domestic, commercial reactors are licensed to use plutonium-based fuel, several are designed to use MOX fuel, and others can easily and safely accommodate a partial MOX core. The fabrication of MOX fuel and its use in commercial reactors have been accomplished in Western Europe. This experience would be used for disposition of the U.S. surplus plutonium. While plutonium from warheads may never have been used in MOX fuel, its behavior in fuel is essentially the same as that of non-weapons-origin plutonium, and so does not present a situation different from MOX fuel experience to date. Plutonium from the different origins is chemically indistinguishable. The difference is isotopic: there is less plutonium 239 in non-weapons-origin plutonium than was produced for use in weapons. MOX fuel, regardless of the origin of the plutonium, has a higher flux than LEU fuel, therefore, it can cause more wear on the reactor than LEU fuel. However, this flux differential would be taken into account during the development of fuel management strategy for the reactor core. Section 4.28 was revised to present the reactor-specific analyses, including accident analyses, for the reactors proposed to use MOX fuel.

AIKEN–5 **Alternatives**

U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons.

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for

Pit disassembly and conversion increases the inventory of sites for cleanup. 6

The SPD EIS process is cooked. The United States should not make MOX fuel if it's not going to use it. 7

reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

AIKEN–6 Pit Disassembly and Conversion

The pit disassembly and conversion process declassifies plutonium from pits and clean metal and converts the plutonium to an oxide. This is a necessary first step for surplus plutonium disposition. This SPD EIS identifies and analyzes potential environmental impacts that might result from the construction and operation of the pit conversion facility at the candidate sites. As described in Chapter 4 of Volume I, these potential impacts would likely be minor. D&D is discussed in Section 4.31. DOE will evaluate options for D&D or reuse of the proposed facilities at the end of the surplus plutonium disposition program. At that time, DOE will perform engineering evaluations, environmental studies, and further NEPA review to assess the consequences of different courses of action.

AIKEN–7 Alternatives

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential environmental impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for surplus plutonium disposition facilities.

DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process.

MOX costs more. DOE should cancel the MOX option and use the savings from the canceled option for more productive purposes. 8

Will the utilities wind up paying more to use MOX fuel? 9

Who pays to provide free plutonium to utilities? Utilities could be paid twice, once by ratepayers, and once by the government. DOE needs to address in what way subsidies provide unfair advantage to some utilities over others. Is DOE willing to buy out commercial utilities to keep MOX going? Who will buy utilities from MOX reactors? Consumers want alternative choices for energy. 10

AIKEN–8 **Cost**

DOE acknowledges the commentor's opposition to the MOX approach based on cost. Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for response. For a better understanding of the cost and schedule estimates for each alternative, consult *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) and *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999). These documents are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

AIKEN–9 **MOX RFP**

DOE's intention is for the use of MOX fuel to be revenue neutral for utilities. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

AIKEN–10 **DOE Policy**

DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. The surplus plutonium would be free to the selected team, DCS, in which the utilities are a partner. DCS would have access to the U.S. Government–owned MOX facility to fabricate fuel for use in the reactor of its choice, in exchange for irradiation of the MOX fuel that would convert the plutonium to meet the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The contract between DOE and DCS does not provide for subsidies to utilities. The supply of electricity by MOX fuel irradiated in the reactor would be determined by the demand for electricity in the reactor's service area.

SRS costs $60 million less than the Pantex option. DOE's own experts estimate savings to exceed $1.5 billion based on eliminating duplicative costs. 11

I have reviewed DOE's cost estimates for accuracy, and I do not believe that DOE's numbers are reflective of actual savings. 12

I recommend that the United States pursue with Russia a course that will yield the best use of available funds. 13

The United States to date has not established plutonium as a commodity. MOX will set this precedent and will remove a credible basis for the nation to oppose international proliferation from military to commercial practices. MOX increases the risk of proliferation. No plutonium should be turned into MOX fuel. 14

AIKEN–11 **Cost Report**

Because this comment relates directly to the cost analysis report, it has been forwarded to the cost analysis team for consideration. The *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

AIKEN–12 **Cost Report**

Because this comment relates directly to the cost analysis report, it has been forwarded to the cost analysis team for consideration. The *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

AIKEN–13 **DOE Policy**

DOE agrees that close cooperation between the United States and Russia is essential to achieve the objectives of nonproliferation and arms reduction, and to ensure secure management of nuclear weapons materials. To that end, the United States and Russia recently made progress in the management and disposition of plutonium. In late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile.

AIKEN–14 **Nonproliferation**

DOE acknowledges the commentor's opposition to the MOX approach. Consistent with the U.S. policy of discouraging the civilian use of plutonium, DOE needs to establish a zero release policy. There is no acceptable amount of release, and DOE should have 100 percent containment. 15

DOE needs to include redundancy in controlling contamination. It needs to adopt an "as low as achievable standard" for workers rather than an "as low as reasonably achievable" standard. 16

Regarding Texas' support for the pit disassembly and conversion mission: the Texas State Republican Platform opposed hazardous waste as an energy source in an agricultural area or above a water source. 17

a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

AIKEN–15 **DOE Policy**

DOE acknowledges the commentor's support of a zero release policy. Operation of the proposed surplus plutonium disposition facilities would comply with applicable Federal, State, and local laws and regulations governing radiological and hazardous chemical releases. DOE would also establish an effective ALARA program to ensure that doses are reduced to levels that are as low as is reasonably achievable.

AIKEN–16 **DOE Policy**

DOE acknowledges the commentor's support of redundancy in controlling contamination. The proposed surplus plutonium disposition facilities would be designed, constructed, operated, and deactivated in accordance with applicable Federal, State, and local environmental, safety, and health requirements. Within these limits, DOE believes that the level of contamination should be kept as low as is reasonably achievable, so that the benefit of reducing the already low level of contamination would warrant the additional cost of that reduction. Worker safety is also a major consideration in construction and operation of the proposed facilities, and safety assessment is an integral part of the design process.

AIKEN–17 **Other**

The surplus plutonium is not hazardous waste, but separated weapons-usable plutonium that the United States is now trying to put into a proliferation-resistant form. By working in parallel with Russia to reduce stockpiles of excess plutonium, the United States can reduce the chance that weapons-usable nuclear material could fall into the hands of terrorists or rogue states and help ensure that nuclear arms reductions will never be

It's in the best interest of the nation to consolidate the plutonium disposition mission at SRS. SRS welcomes two components of the plutonium disposition mission and would like the third component as well. It makes sense to locate the mission at a site where the expertise resides. SRS employs 14,000 workers, and another 10,000 workers have retired from the site. SRS has first-hand knowledge in handling plutonium. 18

There are concerns about Pantex being chosen for pit disassembly and conversion. Pantex has no workforce experience in handling unclad plutonium and no experience with plutonium release. The Pantex workforce is not familiar with the finer aspects of plutonium (i.e., safeguarding in various forms). Processing plutonium requires special skills and extensive experience. Pantex is not designed for the type of work required to process plutonium. 19

SRS has been a good neighbor. DOE provided grants to United Way to offset impacts of downsizing. DOE made it possible for communities to respond to displaced workers. 20

MOX increases the amount of waste. 21

reversed. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

AIKEN–18 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at SRS. As indicated in the revised Section 1.6, SRS is preferred for the proposed facilities because the site has extensive experience with plutonium processing, and these facilities complement existing missions and take advantage of existing infrastructure. Decisions on the surplus plutonium disposition program at SRS will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

AIKEN–19 **Alternatives**

DOE acknowledges the commentor's concerns regarding siting the pit conversion facility at Pantex. The candidate sites for the proposed surplus plutonium disposition facilities would have levels of protection and control compliant with applicable DOE environmental, safety, and health requirements. Training would be provided to all workers involved in the surplus plutonium disposition program. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

AIKEN–20 **Socioeconomics**

DOE acknowledges the commentor's appreciation of SRS and of efforts by DOE to minimize the impacts of downsizing.

AIKEN–21 **Waste Management**

As discussed in Appendix H and Chapter 4 of Volume I, some additional waste would be generated if DOE decided to convert 33 t (36 tons) of the

What is the rationale for commercializing the MOX fuel fabrication process? Commercial reactors are not designed to accommodate MOX fuel. DOE needs to consider the impacts of MOX on individual commercial reactors. Until this is done, the SPD EIS is not complete. 22

The MOX option increases the risk of accidents in commercial reactors. Aging reactors are being closed by communities. MOX licensing opens the door for prolonging the life of some of these reactors. Chernobyl was bad, and an accident with MOX will be worse. 23

surplus plutonium to MOX fuel rather than to immobilize all of the plutonium. This can be seen by comparing Alternative 2 at Hanford, which would involve immobilizing 17 t (19 tons) and fabricating 33 t (36 tons) into MOX fuel, with Alternative 11A, under which all 50 t (55 tons) would be immobilized.

AIKEN–22 **MOX RFP**

DOE's proposed action for surplus plutonium disposition is not a privatization effort, although the acquisition of MOX fuel fabrication and irradiation services has some similarities to DOE's privatization initiative. DOE conducted a procurement process to acquire these services. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process.

Although no domestic, commercial reactors are licensed to use plutonium-based fuel, several are designed to use MOX fuel, and others can easily and safely accommodate a partial MOX core. An amendment to a reactor's NRC operating license would be required before MOX fuel could be used. In addition, core load and safety analyses would be performed and an NRC license amendment approved before MOX fuel was introduced into any reactor. Section 4.28 was revised to discuss the procurement process as well as the potential environmental impacts of the reactors that would use the MOX fuel.

AIKEN–23 **Facility Accidents**

The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program. As discussed in Section 4.28.2.5, studies by NAS have led it to the following conclusion: "no important overall adverse impact of MOX use on the accident probabilities of the LWRs involved will occur; if there are adequate reactivity and thermal margins in the fuel, as licensing review should ensure, the main remaining determinants of accident probabilities will involve factors not related to fuel composition and hence unaffected by the use of MOX rather than LEU fuel." The analysis reflected in Section 4.28 indicates that the change in consequences to the population within 80 km (50 m) of the reactors for the beyond-design-basis

There are more thermal impacts from MOX that haven't been evaluated in the SPD EIS. 24

I am concerned about transporting materials from Rocky Flats and Richland and the added volume it will bring to the region. 25

I am aware of DOE 6450-01-P, Citations for Concerns regarding shipment security. The rise in national and international terrorism mandates that shipments be kept secret. Citizens do not know about foreign fuel shipments unless they go through channels. Citizens do not get the word from DOE. I found out about a DOE shipment through the Internet. I camped out and saw a video shot from a helicopter of a television news team. The shipment was spotted with a $150 telescope. The point is that shipments are vulnerable to terrorists if those terrorists want to get to them. 26

accidents involving MOX fuel would range from minus 4 to plus 14 percent. For the design basis accidents, the incremental change in consequences from MOX fuel would range from minus 6 to plus 3 percent.

AIKEN–24 **MOX Approach**

Following irradiation, the MOX fuel would be removed from the reactor and managed at the reactor site as spent fuel in accordance with the site's normal spent-fuel-handling procedures. In all likelihood, the MOX spent fuel would be stored in a water pool until it could be sent to a potential geologic repository for ultimate disposition pursuant to the NWPA, as amended. Reactors would require NRC operating license amendments and, as part of that process, safety and operational arrangements (e.g., spent fuel management plans) and specific safety and operational issues (e.g., any thermal differences between MOX and LEU fuels) would be evaluated. In any event, it would be the licensee's responsibility to ensure that spent fuels, MOX or LEU, were safely managed. Analyses performed thus far show that MOX fuel would be treated the same as commercial spent fuel, and that no new waste package design would be needed. Should the potential geologic repository not qualify to receive spent fuel, then DOE would make recommendations to the U.S. Congress on how to proceed.

AIKEN–25 **Transportation**

DOE acknowledges the commentor's concern about the transportation of materials in the SRS region. This SPD EIS describes the impacts of the increase in traffic in Section 4.32.4.5. Note that the increase as a result of the surplus plutonium disposition program is about 1 percent. Table L–6 summarizes the potential transportation impacts associated with all SPD EIS alternatives. As indicated in Section 2.18, no traffic fatalities from nonradiological accidents or LCFs from radiological exposures or vehicle emissions are expected.

AIKEN–26 **Transportation**

DOE acknowledges the commentor's concern about shipment vulnerability, and recognizes the possibility of terrorist-related incidents during the disposition of surplus plutonium. Appendix L.6.5 describes the potential

Communities are actively opposed to nuclear materials and waste shipments. DOE's plan to ship powder or oxide form across six states is ridiculous. The potential impacts from an accident are enormous. It's harder to contain the material, and the impact to the public is unacceptable. 27

NRC regulations no longer require double wall containers. DOE should voluntarily use double wall containers for shipping. 28

impacts of a terrorist attack during transportation of the nuclear materials involved in implementing the proposed action. Appendix L.3.2 contains information on the security provided by the Transportation Safeguards System. Appendix L.6.5 was revised to provide more information on safeguards and security for plutonium.

AIKEN–27 **Transportation**

DOE acknowledges the commentor's concern about the shipment of nuclear material and waste. Table L–6 summarizes the potential transportation impacts associated with all surplus plutonium disposition alternatives. As indicated in Section 2.18, no traffic fatalities from nonradiological accidents or LCFs from radiological exposures or vehicle emissions are expected. Transportation risk is just one of many issues that DOE will consider before selecting an alternative. Alternatives 1, 2, 3, 6A, 6B, 7, 8, 9, 10, 11A, and 12A do not require shipping oxide that was converted from the pits and metal.

AIKEN–28 **Transportation**

The Type B packages that would be used to transport plutonium pits, metal, and oxide are designed to withstand test conditions described in Appendix L.3.1.6 which represent extremely severe accidents (estimated to be more severe than over 99 percent of all accidents that could occur) and still contain the packaged radioactive contents. Type B packages have been used for years to ship radioactive materials in the United States and around the world. To date, no Type B package has ever been punctured or released any of its contents, even in actual highway accidents. As described in Appendix L.3.1.5, the Type B package is extremely robust and provides a high degree of confidence that even in extremely severe accidents the integrity of the package would be maintained with essentially no loss of the radioactive contents or serious impairment of the shielding capability. Transportation would be required for both the immobilization and MOX approaches to surplus plutonium disposition. Transportation of special nuclear materials, including fresh MOX fuel, would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material.

DOE should note that citizens' organizations in Russia also oppose MOX. 29

As a minister, I am tempted to go to a higher authority than elected officials to encourage our DOE officials to make the correct decision for our entire nation. 30

DOE should conduct meetings in Barnwell and Allendale counties as well as in Augusta. 31

The opposing comments offered at this meeting are not being made by locals and do not represent the South Carolina community. DOE has heard from a diversity of community members, and all support the plutonium disposition mission. The SRS Retiree Association Board of Directors support a consolidated mission at SRS. SRS is strongly supported by local citizens. 32

AIKEN–29 **Alternatives**

DOE acknowledges the commentor's observation that citizens' organizations in Russia also oppose the MOX approach.

AIKEN–30 **Other**

DOE acknowledges the commentor's position. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

AIKEN–31 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's request for additional hearings in Barnwell and Allendale Counties. During the comment period, July 17 through September 16, 1998, DOE hosted five public hearings that provided opportunities for oral and written comment on the SPD Draft EIS. Afternoon and evening workshops were held at the five hearings. The hearing in North Augusta, South Carolina, was held at the North Augusta Community Center, a location near Barnwell and Allendale Counties, on August 13. For persons unable to attend these hearings, DOE provided opportunities for submitting comments by various means: mail, a toll-free telephone and fax line, and the MD Web site. All comments were given equal consideration, regardless of how they were submitted.

AIKEN–32 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at SRS. As indicated in the revised Section 1.6, SRS is preferred for the proposed facilities because the site has extensive experience with plutonium processing, and these facilities complement existing missions and take advantage of existing infrastructure. Decisions on the surplus plutonium disposition program at SRS will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

Commercial reactor communities are not as supportive of the MOX option as DOE Complex communities. 33

DOE is not considering communities where commercial reactors are located. DOE needs to hold meetings in the vicinity of commercial reactors being considered to burn MOX fuel to allow communities the chance to influence the MOX decision. 34

AIKEN–33 **MOX Approach**

DOE acknowledges the commentor's observation that reactor communities may not be as supportive of the MOX approach as DOE complex communities. Commercial reactors in the United States are capable of safely using MOX fuel. The fabrication of MOX fuel and its use in commercial reactors have been accomplished in Western Europe. This experience would be used for disposition of the U.S. surplus plutonium. The environmental, safety, and health consequences of the MOX approach, as well as the production and disposal of any waste, are addressed by DOE in this SPD EIS. The MOX facility would be licensed by NRC under 10 CFR 70, and NRC would continue to be responsible for licensing the reactors that use MOX fuel, and as such would have to approve the use of MOX fuel through the license amendment process.

DOE used several means to solicit comments on the surplus plutonium disposition program from the public; State, local and tribal officials; special interest groups; and other interested parties. These include mail, a toll-free telephone and fax line, and the MD Web site. In addition, DOE has conducted public hearings in excess of the minimum required by the NEPA regulations on the weapons-usable fissile materials disposition program and discussed materials disposition in many other public forums.

AIKEN–34 **General SPD EIS and NEPA Process**

The SPD Final EIS was not issued until specific reactors had been identified and the public had an opportunity to comment on the reactor-specific information. As part of the procurement process, bidders were asked to provide environmental information to support their proposals. This information was analyzed in an Environmental Critique prepared for the DOE source selection board prior to award of the MOX fuel fabrication and irradiation services contract. DOE then prepared an Environmental Synopsis on the basis of the Environmental Critique, which was released to the public as Appendix P of the *Supplement to the SPD Draft EIS* in April 1999. A hearing was held in Washington, D.C. on specific reactor information. After careful consideration of its public involvement opportunities, including information availability and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement*. DOE provided other

What is DOE planning to do about the spent fuel from MOX? 35

I support nuclear energy. 36

The technology proposed at Pantex would require "high-fire" oxide, which is usable for MOX without extensive pretreatment. If aqueous processing is required to meet the MOX standard, how will DOE do it? Will DOE use a polishing process? 37

means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. The *Supplement* was mailed to those stakeholders who requested it as well as those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, Sourth Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

AIKEN–35 **MOX Approach**

Following irradiation, the MOX fuel would be removed from the reactor and managed at the reactor site as spent fuel in accordance with the site's normal spent-fuel-handling procedures. In all likelihood, the MOX spent fuel would be stored in a water pool until it could be sent to a potential geologic repository for ultimate disposition pursuant to the NWPA, as amended. Reactors would require NRC operating license amendments and, as part of that process, safety and operational arrangements (e.g., spent fuel management plans) and specific safety and operational issues (e.g., any thermal differences between MOX and LEU fuels) would be evaluated. In any event, it would be the licensee's responsibility to ensure that spent fuels, MOX or LEU, were safely managed. Analyses performed thus far show that MOX fuel would be treated the same as commercial spent fuel, and that no new waste package design would be needed. Should the potential geologic repository not qualify to receive spent fuel, then DOE would make recommendations to the U.S. Congress on how to proceed.

AIKEN–36 **Other**

DOE acknowledges the commentor's support for nuclear energy.

AIKEN–37 **Plutonium Polishing and Aqueous Processing**

Appendix N of the SPD Draft EIS discusses the environmental impacts of adding a small plutonium-polishing process into either the pit conversion or MOX facility as a contingency. On the basis of public comments on the SPD Draft EIS, and the analysis performed as part of the MOX procurement, Why is the pit disassembly and conversion facility so much cheaper to build than the other facilities? 38

Is the variance projected in the Cost Report due to uncertainties (equipment needs, etc.)? 39

The cost numbers seem low and should be double checked to ensure consistency. The $2,400 per square foot seems low. 40

DOE has included plutonium polishing as a component of the MOX facility to ensure adequate impurity removal from the plutonium dioxide. Appendix N was deleted from the SPD Final EIS, and the impacts discussed therein were added to the impacts sections presented for the MOX facility in Chapter 4 of Volume I. Section 2.18.3 was also revised to include the impacts associated with plutonium polishing.

AIKEN–38 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

AIKEN–39 **Cost Report**

Because this comment relates directly to the cost analysis report, it has been forwarded to the cost analysis team for consideration. The *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

AIKEN–40 **Cost Report**

Because this comment relates directly to the cost analysis report, it has been forwarded to the cost analysis team for consideration. The *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

There are hidden costs in startup. SRS has extensive expertise with a long history of operation and startups. Discipline is required for startups, and it benefits from extensive experience. 41

SRS is the best site for a consolidated mission. It's the right thing to do, just do it. 42

SRS has the best qualified workforce and site for plutonium processing. Other sites have adopted a lot of SRS' training practices. 43

AIKEN–41 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program at SRS will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

AIKEN–42 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at SRS. As indicated in the revised Section 1.6, SRS is preferred for the proposed facilities because the site has extensive experience with plutonium processing, and these facilities complement existing missions and take advantage of existing infrastructure. Decisions on the surplus plutonium disposition program at SRS will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

AIKEN–43 **Alternatives**

DOE acknowledges the commentor's support for the SRS workforce and for siting the proposed surplus plutonium disposition facilities at SRS. As indicated in the revised Section 1.6, SRS is preferred for the proposed facilities because the site has extensive experience with plutonium processing, and these facilities complement existing missions and take advantage of existing infrastructure. Decisions on the surplus plutonium disposition program at SRS will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

Westinghouse is an added reason and benefit for bringing a consolidated mission to SRS. Safety is the company's top priority. The company looks at the big picture and has the supporting management and infrastructure in place to be competitive. 44

If the plutonium needs to be purified, SRS offers the flexibility to go to aqueous processing by using the canyon facilities. 45

All waste management activities and processes are in place at SRS to support a plutonium disposition mission. SRS would not require a new waste management infrastructure. 46

In the Stockpile Stewardship and Management PEIS, the decision was made that Pantex would not be contaminated with plutonium. A 1996 decision document disqualified Pantex for processing (including dry processing). 47

AIKEN–44 **Alternatives**

DOE acknowledges the commentor's observations about Westinghouse and safety.

AIKEN–45 **Plutonium Polishing and Aqueous Processing**

An aqueous process for conversion of plutonium would have to be placed in a new facility. Existing canyon facilities at SRS are not configured for a surplus plutonium disposition mission and are either shut down or planned for shutdown and D&D. For example, use of F-Canyon at SRS would result in a requirement to reconfigure facilities and to keep the canyon operating for at least another 10 years. DOE has already made a commitment to the public, the U.S. Congress, and DNFSB to shut the canyon down.

AIKEN–46 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at SRS. As indicated in the revised Section 1.6, SRS is preferred for the proposed facilities because the site has extensive experience with plutonium processing, and these facilities complement existing missions and take advantage of existing infrastructure. Decisions on the surplus plutonium disposition program at SRS will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

AIKEN–47 **Alternatives**

The *Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management* (SSM PEIS) (DOE/EIS-0236, September 1996) states that the pit fabrication mission would not be introduced into a site that does not have an existing plutonium infrastructure because of the high cost of new plutonium facilities and the complexity of introducing plutonium operations into sites without current plutonium capabilities. The SSM PEIS states further that an important element of the site selection strategy is to maximize the use of existing infrastructure and facilities as the nuclear weapons complex becomes smaller and more efficient in the 21st century; thus, no new facilities were to be built to accommodate stockpile management missions.

Does DOE plan not to comply with NRC Regulation 0800 [*refers to aircraft crash scenarios*]? 48

Accordingly, DOE considered as reasonable only those sites with existing infrastructure capable of supporting a pit fabrication mission. Although Pantex has the infrastructure to carry out its current weapons assembly and disassembly mission and nonintrusive pit reuse program, it was not considered a viable alternative for the pit fabrication mission because it did not possess sufficient capability and infrastructure to meet the SSM PEIS siting assumption stated above. Among the operations that were considered in developing siting alternatives for pit fabrication in the SSM PEIS were plutonium foundry and mechanical processes, including casting, shaping, machining, and bonding; a plutonium-processing capability for extracting and purifying plutonium to a reusable form either from pits or residues; and assembly operations involving seal welding and postassembly processing.

When comparing the site selection strategy for pit disassembly and conversion with that used for the pit fabrication mission, the siting criteria in the SSM PEIS have little or no bearing on siting criteria used in this SPD EIS. Pit disassembly and conversion do not require the foundry and mechanical processes discussed in the SSM PEIS and can be accomplished in a stand-alone facility. Also, the SSM PEIS siting assumptions include a requirement to use existing facilities, whereas, the pit conversion facility would be a new structure no matter where it is located.

AIKEN–48 **Facility Accidents**

The aircraft crash analysis for this SPD EIS was performed in accordance with *Accident Analysis for Aircraft Crash Into Hazardous Facilities* (DOE-STD-3014-96, October 1996). DOE was cognizant of NRC NUREG-0800 in its development of DOE-STD-3014.

How many years will it take to complete the disposition process? 1

When will the decision [*by DOE*] be made? 2

I support the hybrid approach for plutonium disposition. I support 33 metric tons going to MOX fuel. For immobilization of the 17 metric tons, I suggest that 7 metric tons be immobilized, and the decision on the rest (10 metric tons) be delayed until the two processes are demonstrated. 3

PORTLD–1 **Alternatives**

Appendix E includes schedules for the proposed surplus plutonium disposition facilities. Under the hybrid approach, the proposed facilities would cease operation by 2019. Section 4.30.2 includes a discussion and analysis of a slightly extended period of operation to account for potential delays due to issues such as negotiations with other countries and facility startup experiences. By 2016, the immobilization effort would be complete, and the HLW canisters containing the immobilized plutonium would be in storage awaiting disposition at the potential geologic repository. However, some of the MOX fuel assemblies might still be in reactors or awaiting insertion; DOE's *RFP for MOX Fuel Fabrication and Reactor Irradiation Services* (May 1998) specified a timetable that included a date for last insertion of MOX fuel into a reactor of no later than 2019. If the last insertion occurs in 2019, these assemblies could be undergoing irradiation until 2022. If all the surplus plutonium were dispositioned through immobilization, that effort would be completed by 2016.

PORTLD–2 **General SPD EIS and NEPA Process**

DOE will announce its decision regarding the surplus plutonium disposition program in the SPD EIS ROD. The ROD will be issued no sooner than 30 days after publication of this EIS.

PORTLD–3 **Alternatives**

DOE acknowledges the commentor's support of the hybrid approach to surplus plutonium disposition. The amount of surplus plutonium directed to each option is related to the suitability of the plutonium for use as MOX fuel. In the ROD for the *Storage and Disposition PEIS*, DOE decided that approximately 8 t (9 tons) of the current surplus plutonium were not suitable for use in MOX fuel, and would therefore be immobilized. As described in this SPD EIS, an additional 9 t (10 tons) were identified as unsuitable for MOX fuel fabrication. The 17 t (19 tons) of surplus plutonium are not suitable for fabrication due to the complexity, timing, and cost that would be involved in purifying the material. The remaining 33 t (36 tons) of the 50 t (55 tons) of surplus plutonium would be fabricated into MOX fuel. Both immobilization and MOX technologies are sufficiently mature and demonstrated. Therefore, I support the can-in-canister technology/approach. What is the difference between the can-in-canister technology and regular vitrification? Is the canister made of steel? When will the container dissolve? Will it last for 10,000 years? When things disintegrate is a primary question when dealing with hot materials. DOE needs to go high-quality, not cut costs at the expense of safety. 4

Where will the vitrification occur? 5

decisions on the amount of plutonium to be dispositioned by each method can be made. In fact, MOX fuel is routinely fabricated and used in Western Europe. This experience would be used for disposition of the U.S. surplus plutonium. Any R&D currently underway or planned for the near future would only contribute to fine-tuning and increasing the efficiency of the processes, but would not affect disposition technology decisions.

PORTLD–4 **Immobilization**

DOE acknowledges the commentor's support of the can-in-canister immobilization approach to surplus plutonium disposition. In the "regular" vitrification approach, the surplus plutonium would be blended directly with molten glass and HLW to form a homogenous mixture that would then be poured into large, stainless steel canisters. In the can-in-canister approach, however, the plutonium would first be immobilized in ceramic or glass, and loaded into smaller individual stainless steel cans. A number of these cans would then be placed inside the stainless steel canister, which in turn would be filled with HLW glass. The can-in-canister approach is described further in Section 2.4.2, and the potential environmental impacts associated with the homogenous vitrification and can-in-canister immobilization approaches are compared in Section 4.29. The waste canister used in either approach would be the same as those currently used in DOE's HLW vitrification program, and as such would meet all repository acceptance and performance criteria.

PORTLD–5 **Alternatives**

Immobilization in either glass or ceramic form could take place at either Hanford or SRS. As indicated in Section 1.6, SRS is preferred for the immobilization facility. The preferred can-in-canister approach at SRS complements existing missions, takes advantage of existing infrastructure and staff expertise, and enables DOE to use an existing facility (DWPF). DOE is presently considering a replacement process for the in-tank precipitation (ITP) process at SRS. The ITP process was intended to separate soluble high-activity radionuclides (i.e., cesium, strontium, uranium, and plutonium) from liquid HLW before vitrifying the high-activity fraction of the waste in DWPF. The ITP process as presently configured cannot achieve production goals and safety requirements for processing HLW. Three alternative processes are being evaluated by DOE: ion exchange, small tank precipitation, and direct grout.

I support the SPD EIS, but would like to see full immobilization and no MOX. 6

I'm opposed to the MOX option. There are safety concerns, more waste will be generated, and it will incur cost overruns. 7

DOE's preferred immobilization technology (can-in-canister) and immobilization site (SRS) are dependent upon DWPF providing vitrified HLW with sufficient radioactivity. DOE is confident that the technical solution will be available at SRS by using radioactive cesium from the ion exchange or small tank precipitation process. A supplemental EIS (DOE/EIS-0082-S2) on the operation of DWPF and associated ITP alternatives is being prepared. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PORTLD–6 **Alternatives**

DOE acknowledges the commentor's support for the immobilization-only approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PORTLD–7 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach based on safety, waste, and cost concerns. DOE continually evaluates equipment performance to identify potential health and safety problems. New design features can be incorporated and operational procedures modified, as necessary, to reduce or even eliminate these problems. As stated in Section 2.4, the designs of the plutonium disposition facilities are not final. They are subject to modification during the design and construction process. Modifications, as appropriate, may be made to reduce radiation exposures

The National Academy of Science is opposed to MOX; they say it is too costly. 8

and optimize equipment placement and process flow. The proposed surplus plutonium disposition facilities would incorporate design features and be operated in a manner that reduces doses to workers and the public to levels that are as low as is reasonably achievable.

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PORTLD–8 **MOX Approach**

DOE acknowledges the commentor's concern regarding cost of the MOX approach. An NAS panel of investigators found the MOX approach promising for the timely disposition of surplus plutonium. In the report, *Management and Disposition of Excess Weapons Plutonium, Reactor-Related Options* (1995), NAS compared the costs of the immobilization and MOX approaches. Both approaches were comparable in cost for most of the MOX fuel options discussed.

If the Department goes to commercial burn, who owns the fuel? 9

Will the commercial reactors need to be modified for MOX fuel? 10

DOE stated that MOX fuel fabrication has to be performed on DOE land. Siemens Nuclear Fuels, Inc., is located across the street from FMEF on public land. Siemens is a missed opportunity because it is located on commercial land, but is located adjacent to FMEF. Siemens Nuclear Fuels would be a good choice as a pilot test plant at Hanford. 11

The MOX mission puts the economy at risk. The Washington Public Power Supply System (WPPSS) is putting out an RFP for MOX. WPPSS has a history of cost overruns. 12

PORTLD–9 **DOE Policy**

DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. DOE would own the unirradiated fuel until it was received at the reactor site, at which time the reactor licensee would take ownership.

PORTLD–10 **MOX RFP**

Commercial reactors in the United States are capable of safely using MOX fuel. An amendment to a reactor's NRC operating license would be required before MOX fuel could be used. For this amendment, the licensee would have to demonstrate that all safety, testing, and environmental impacts had been addressed.

PORTLD–11 **Lead Assemblies**

DOE acknowledges the commentor's suggestion that lead assemblies be fabricated at the Siemens Nuclear Fuels facilities adjacent to FMEF at Hanford. Existing facilities at five candidate DOE sites were evaluated in this SPD EIS. As discussed in the revised Section 1.6, based on consideration of capabilities of the candidate sites and input from the DCS on the MOX approach, DOE prefers LANL for lead assembly fabrication. LANL is preferred because it already has fuel fabrication facilities that would not require major modifications, and takes advantage of existing infrastructure and staff expertise. Additionally, the surplus plutonium dioxide that would be used to fabricate the lead assemblies would already be in inventory at the site. Decisions on lead assembly fabrication will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PORTLD–12 **MOX RFP**

DOE conducted a competitive procurement process to acquire MOX fuel fabrication and irradiation services. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well

Commercial reactors are approaching their life expectancy. 13

Cost savings are a mirage; the project savings are bull. There is a history of cost overruns in commercial reactors, as well as within DOE. The general public assumption is that there will be cost overruns. 14

Regarding the $2 billion program costs, is the money appropriated? 15

as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. Selection criteria employed ensured that the reactors chosen were capable of safe and successful surplus plutonium disposition. The criteria included, among other factors, recent facility operating history. WPPSS is not one of the reactors chosen to use MOX fuel.

PORTLD–13 **DOE Policy**

Qualification criteria used to select the domestic, commercial reactors included the ability of the reactors to complete the surplus plutonium disposition program within their operational lives as dictated by their licenses. The operating licenses for Catawba Units 1 and 2 expire in 2024 and 2026, respectively; those for McGuire Units 1 and 2, in 2021 and 2023, respectively; and those for North Anna Units 1 and 2, in 2018 and 2020, respectively. Section 4.28 was revised to discuss the potential environmental impacts of operating these reactors.

PORTLD–14 **Cost**

DOE acknowledges the commentor's position. Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–15 **Cost**

Since the estimates span the lifetime of the surplus plutonium disposition program, which is upwards of 20 years, the money has not yet been appropriated. For fiscal year 1999, money has been appropriated; for near-term out-years (the next 2 years), a budget request will be submitted to the U.S. Congress; for out-years (5 years), a projection is provided to Congress with the fiscal year 2000 budget request of what the program's liability or mortgage will be. More information on the Federal Budget Process may be obtained at http://arc.org.tw/law/majorlaws/96-912.htm.

How much will MOX cost? 16

Is MOX fuel less expensive than fuel made with highly enriched uranium? 17

MOX subsidizes commercial utilities; the program should not be used to subsidize commercial utilities. 18

"Waste produced at commercial reactors" assumes that commercial reactors will continue to operate. Who pays? 19

PORTLD–16 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–17 **Cost**

LEU, not HEU, fuel is used in the U.S. commercial nuclear industry. If the effective value of MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

PORTLD–18 **DOE Policy**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program. The remainder of this comment is addressed in response PORTLD–17.

PORTLD–19 **Cost**

The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program. These reactors would be operational even if they were not selected to irradiate MOX fuel. As described in

Hanford has facilities, such as FMEF, which lend themselves to reducing plutonium disposition costs. FMEF reduces costs by $50 million; other independent estimates are higher at $200 million to $900 million. 20

Currently, infrastructure costs at Hanford are paid out of cleanup dollars; an additional mission such as MOX could share the infrastructure and overhead expense, and leave more money for cleanup. 21

Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Therefore, DCS would pay for the disposal of MOX spent fuel in the same manner as it would that of LEU spent fuel. Ultimately, the consumer pays the cost of operating the commercial reactor. However, DCS would not have to continue to use MOX fuel if it determined that it was uneconomical to operate the reactor. This would preclude the continuation of reactor operations solely for purposes of the surplus plutonium disposition program. Furthermore, DCS would only be reimbursed for costs solely and exclusively related to the MOX fuel irradiation. This would ensure that the taxpayers were not underwriting otherwise uneconomical electricity-generating assets.

PORTLD–20 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–21 **Cost**

Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably.

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

The Kremlin determines the amount of money spent on defense. It seems that Russia is still in the driver's seat for reducing weapons. 22

Russia's economy is crumbling. The MOX option is a slow process and could possibly slow the declassification of pit materials. 23

PORTLD–22 **DOE Policy**

The United States and Russia recently made progress in the management and disposition of plutonium. In late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile. The United States does not currently plan to implement a unilateral program; however, it will retain the option to begin certain surplus plutonium disposition activities in order to encourage the Russians and set an international example.

PORTLD–23 **DOE Policy**

In late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. Understanding the economic dilemma in Russia, the U.S. Congress has appropriated funding for a series of small-scale tests and demonstrations of plutonium disposition technologies jointly conducted by the United States and Russia. For fiscal year 1999 (starting October 1998), Congress further appropriated funding to assist Russia in design and construction of a plutonium conversion facility and a MOX fuel fabrication facility. This funding would not be expended until the presidents of both countries signed a new agreement. Further, selection of the disposition technology (immobilization and/or MOX approach) should not impact the pace of pit declassification. Pit declassification would more likely depend on the agreements reached with Russia.

MOX creates a new plutonium infrastructure that is counter to the nonproliferation treaty. The Atoms for Peace program advocates keeping military nuclear materials separate from commercial nuclear materials. In addition, back in the Eisenhower administration, it was agreed that weapons plutonium could not be used for civilian purposes. 24

Is the program creating plutonium (MOX fuel) that could be used to make a weapon? 25

Hanford should be considered for MOX and immobilization. FMEF is designed for MOX fuel fabrication and meets NRC and other requirements (i.e., National Quality Assurance Standard). FMEF could handle two of the three options; pit disassembly and conversion at Pantex requires a new facility. Pits should remain at Pantex and oxide should be shipped to Hanford. 26

PORTLD–24 **DOE Policy**

DOE acknowledges the commentor's opposition to the commercial use of weapons-usable plutonium. The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

PORTLD–25 **DOE Policy**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. The purpose of the MOX approach is to convert the surplus plutonium to a form that meets the Spent Fuel Standard, thereby providing evidence of irreversible disarmament and establishing a model of proliferation resistance. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

MOX fuel fabrication involves blending the plutonium dioxide with uranium dioxide, forming the mixed oxide into pellets, loading the pellets into fuel rods, and assembling the fuel rods into fuel assemblies. The fuel assemblies would be transported to the commercial reactors selected to irradiate the MOX fuel. Following irradiation, the MOX fuel would be removed from the reactor and managed at the reactor site as spent fuel. Final disposition would be at a potential geologic repository pursuant to the NWPA, as amended.

PORTLD–26 **Alternatives**

DOE acknowledges the commentor's support for siting the immobilization and MOX facilities in FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying

It's logical that FMEF be considered since [*plutonium*] materials reside at Hanford. 27

By using FMEF at Hanford, the timetable for bringing the mission online could be shortened. 28

Original research for MOX fuel was performed at Hanford; the original concept used plutonium. The MOX pilot plant in Richland was the original breeder reactor. Hanford is experienced in handling MOX fuel. 29

preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–27 **Alternatives**

DOE acknowledges the commentor's support for the surplus plutonium disposition program using FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–28 **Alternatives**

DOE acknowledges the commentor's support for the surplus plutonium disposition program using FMEF at Hanford. Use of FMEF for disposition activities would not shorten the timetable for bringing the proposed surplus plutonium disposition facilities online. FMEF would require extensive renovation for use as a surplus plutonium disposition facility, and would also require construction of annexes for both the immobilization and MOX facilities. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–29 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus

Hanford has about 4 metric tons of scrap plutonium in the
Plutonium Finishing Plant, and the new Hanford vitrification facility 30
could handle scrap plutonium disposition.

DOE has proclaimed cleanup as Hanford's No. 1 mission.
Congressman Hastings and U.S. Senator Gorton agree with the
cleanup mission, but also support FMEF for plutonium disposition
mission. SRS has a cleanup mission as well. If SRS can handle it in 31
addition to a plutonium disposition mission, so can Hanford. Other
missions at the site will keep federal funds flowing to Hanford.

Not every company at Hanford needs to be involved with cleanup. 32
Other companies can be brought in to perform the MOX mission.

plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–30 **Alternatives**

DOE acknowledges the commentor's support for the surplus plutonium disposition program at Hanford. The 4 t (4.4 tons) of surplus nonpit plutonium referred to in this comment is part of the 17 t (19 tons) of surplus plutonium destined for immobilization under all alternatives analyzed in this SPD EIS except the No Action Alternative. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–31 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities using FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–32 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

How much waste will be produced by MOX? 33

Regarding the comment [*refers to DOE's response at the meeting to another comment*] about accidents and latent cancer fatalities, the tone is too flippant. Citizens have serious concerns about any deaths occurring. 34

Cancer risk projections are a myth. DOE cannot substantiate numbers that say the program does not cause deaths. 35

PORTLD–33 **Waste Management**

Estimates of the amounts of TRU, LLW, mixed LLW, hazardous and nonhazardous wastes that would be generated by construction and operation of the MOX facility are presented in Appendix H. Appendixes H.1.2.3, H.2.2.2, H.3.2.2, and H.4.2.3 describe the wastes that would be generated by the MOX facility at Hanford, INEEL, Pantex, and SRS, respectively.

PORTLD–34 **Facility Accidents**

DOE is committed to public and worker safety during construction, operation, and deactivation of the proposed surplus plutonium disposition facilities, and would implement appropriate controls and procedures to ensure compliance with all applicable Federal, State, and local laws, regulations, and requirements. DOE would also establish an effective ALARA program to ensure that radiological and hazardous chemical doses are reduced to levels that are as low as is reasonably achievable.

PORTLD–35 **Human Health Risk**

The cancer risk projections used in this SPD EIS (see Appendix K.1.4.3) are based on the latest risk estimators available to the scientific community. These estimators are given in Section 3.4.2 of *1990 Recommendations of the International Commission on Radiological Protection* (ICRP Publication 60, November 1991). They are based on updated information on the probability of radiation-induced cancer deaths from the continuing assessment of the more than 90,000 survivors of the atomic bombings of Japan and from other cancer studies. A detailed discussion of all the pertinent sources of information is provided as Annex B of the ICRP publication. The risk estimators were used to project the LCF values given for normal operations and postulated accidents in Chapter 4 of Volume I.

DOE does not claim that its surplus plutonium disposition program would cause no adverse health effects, but rather demonstrates that the risk of fatal cancers among workers and the general public is minimal.

Any new waste generated at Hanford is too much. 36

Northwest citizens are concerned about health and safety for workers and the public; the health of the Columbia River and fish must be preserved. 37

The proper weight was not given to the analysis of dose reconstruction. We're not convinced of the argument to give new missions to Hanford. 38

PORTLD–36 **Waste Management**

Estimates of the amounts of TRU, LLW, mixed LLW, hazardous and nonhazardous wastes that would be generated by construction and operation of the proposed surplus plutonium disposition facilities are presented in Appendix H. Appendix H.1.2.3 describes the wastes that would be generated by the MOX facility at Hanford.

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–37 **Human Health Risk**

DOE is committed to protecting the safety and health of the public and its workers, which includes designing, constructing, and operating its facilities in such a way as to provide a level of safety and reliability that meets or exceeds that characterized by modern commercial standards.

In regard to any concerns that may be associated with the Columbia River and the aquatic life therein, as described in Section 4.26.1.2, surface water would not be used in construction and operation of the proposed surplus plutonium disposition facilities at Hanford. Due to the dilution capability of the Columbia River, as well as FMEF's location relative to the Columbia River, there would be no discernible contamination of aquatic biota (fish) or drinking water resulting from the proposed facilities at Hanford, either from minute quantities of air deposition into the river or from any other potential wastewater releases. Therefore, no discernible impacts on the Columbia River would be expected.

PORTLD–38 **Human Health Risk**

Potential health impacts (i.e., doses and associated cancer risks) of the different alternatives that involve Hanford are elaborated in the Human Health Risk and Facility Accident sections in Chapter 4 of Volume I, as well as Appendixes J and K. The depth of the dose analyses is in compliance with NEPA (42 U.S.C. 4321 et seq.) and with *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements* (DOE Office of NEPA Oversight, May 1993).

I represent organic farmers in the Columbia Basin striving for environmentally responsible farming. There is a challenge that continued activities from the nuclear and agricultural industries not impact the land. Friends and family members in the Tri-Cities area experienced health problems. They consumed game and river products. 39

PORTLD–39 **Human Health Risk**

DOE acknowledges the commentor's concern regarding potential health effects of historical releases at Hanford. Section 3.2.4 presents information on past and existing human health risk characteristics. Included are discussions of radiation exposure, chemical exposure, and health effects studies, as well as an accident history.

The Atomic Energy Act of 1954 authorizes DOE to establish standards to protect health and minimize dangers to life. DOE designs, locates, constructs, and operates its facilities in such a way as to provide a level of public safety that meets or exceeds the standards of modern commercial plants. Radiation protection standards are based on keeping radioactive releases at ALARA levels in recognition of the potential risk of radiation exposure. All alternatives proposed in this EIS would conform to those radiation protection standards.

As described in Appendix J.1.1.3, agricultural Census food production data established via DOC were used in the radiological dose assessments for this SPD EIS. These data were separated into eight individual categories: leafy vegetables, root vegetables, fruits, grains, beef (livestock), poultry, milk, and eggs. Analysis of per-county production provided for a high degree of accuracy in the assessment of dose via the ingestion pathway.

As shown in Appendix J.1.2.7.2, if the proposed surplus plutonium disposition facilities were located at Hanford, a very small incremental annual dose to the surrounding public from normal operations would result via radiological emission deposition on agricultural products. This dose (about 6.9 person-rem/yr) would be 0.006 percent of the radiation dose that would be incurred annually from natural background radiation.

Due to the dilution capability of the Columbia River, as well as FMEF's location relative to the Columbia River, there would be no discernible contamination of aquatic biota (fish) or drinking water resulting from surplus plutonium disposition activities at Hanford, either from minute quantities of air deposition into the river or from any potential wastewater releases. Thus, it is estimated that no component of the public dose would be attributable to liquid pathways.

DOE needs to consider the effects of an accident on surrounding communities. Columbia Basin farmers bring their agricultural products to Portland. There is a lot of farmland within the impact zone/sphere of influence of Hanford. It's time that Hanford is removed from service. Optics of a closed site are better for farmers. 40

What kind of security is proposed when moving materials from site to site? Will it be as tight and secure as Navy transports? 41

What will happen to Hanford's plutonium? Will it be transported offsite? 42

Is special handling required to transport the spent fuel once the MOX burn is complete? 43

PORTLD–40 **Facility Accidents**

The effects of hypothetical accidents are analyzed in this SPD EIS in terms of the estimated population dose within 80 km (50 mi). Doses are conservatively estimated. Economic costs such as those associated with crop loss due to potential accidents have not been estimated; most of the potential contamination would occur on the Hanford site.

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–41 **Transportation**

All intersite shipments of plutonium for the surplus plutonium disposition program would be made using DOE's SST/SGT system. This involves having couriers that are armed Federal officers, an armored tractor to protect the crew from attack, and specially designed escort vehicles containing advanced communications and additional couriers. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in this SPD EIS. Details of the security systems are described in Appendix L.3.2. Special nuclear material shipments would be carried out in much the same manner in which the Navy transports HEU.

PORTLD–42 **Transportation**

Depending on the decision made by DOE, the surplus plutonium could be either (1) placed in long-term storage at Hanford (i.e., the No Action Alternative) or (2) immobilized at Hanford or shipped to SRS for immobilization, and subsequently shipped to a potential geologic repository for disposition.

PORTLD–43 **Transportation**

The licensee irradiating the MOX fuel for DOE would handle the MOX spent fuel in the same basic manner as it does the normal LEU spent fuel. There would be no need for new or separate facilities (spent fuel pool), storage containers, or shipping containers.

I disliked receiving 5 pounds of materials that I could not understand. The Department should provide a one page summary of what the EIS is about. 44

The SRS decision is politically motivated (Strom Thurmond, Newt Gingrich). SRS is important to that region politically. 45

Any EIS being produced is driven by politics. The decisions are politically based, not technically based. 46

Why is it so difficult to get adequate funding for cleanup if funding is so readily available for this project? 47

Funding for cleanup is inadequate at Hanford. Cost savings are critical to future cleanup success. If a weapons mission starts up again, it will take away funding for cleanup. I'm skeptical that Hanford will get adequate funding for cleanup, which drives how stakeholders approach getting new missions. Hanford's waste legacy must be dealt with. 48

PORTLD–44 **General SPD EIS and NEPA Process**

The size of this SPD EIS is attributable in part to the level of information required for compliance with NEPA. Other factors are the complexity of the proposed action and the need to include a range of reasonable alternatives. Because of the document's size, DOE has prepared a fact sheet for the purpose of directing readers to information of specific interest, and, also in accordance with NEPA, a short summary of the information.

PORTLD–45 **General SPD EIS and NEPA Process**

Decisions on the surplus plutonium disposition program at SRS will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PORTLD–46 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's views on the basis for EIS decisionmaking. This SPD EIS contains the best information and analyses available to allow for a fair comparison among the candidate sites for the proposed surplus plutonium disposition facilities. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PORTLD–47 **DOE Policy**

Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably. Further, since Hanford's cleanup mission and funding are not part of the surplus plutonium disposition program, they should not be impacted by decisions made in connection with this SPD EIS.

PORTLD–48 **DOE Policy**

DOE acknowledges the commentor's concern for adequate funding for cleanup. Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably. Further, It's time to get the Tri-Cities off of the public dole. Recruiting new missions is contrary to moving the Tri-Cities away from government missions. The public supports Hanford cleanup, not new missions. 49

The current history of DOE privatization efforts, such as for the Tank Waste Remediation System, proves that privatization is more expensive than if managed by the government. 50

Once the MOX fuel rods are passed through the reactor, where will the spent fuel be stored? 51

I am concerned about the waste. There is spent fuel in temporary storage all over the country with no place available (repository) for permanent storage. The United States is not making any real progress in handling the waste. We should not be generating new waste until the first problem is solved. 52

since Hanford's cleanup mission and funding are not part of the surplus plutonium disposition program, they should not be impacted by decisions made in this SPD EIS.

PORTLD–49 **DOE Policy**

DOE acknowledges the commentor's opposition to new missions at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–50 **DOE Policy**

DOE's proposed action for surplus plutonium disposition is not a privatization effort, even though the acquisition of MOX fuel fabrication and irradiation services has some similarities to the TWRS privatization efforts.

PORTLD–51 **MOX Approach**

Following irradiation, the MOX spent fuel would be removed from the reactor and stored in the spent fuel pond or in dry storage casks at the reactor site until final disposal at a potential geologic repository pursuant to the NWPA, as amended. Additional information on MOX spent fuel management is provided in Section 4.28.2.8.

PORTLD–52 **Repositories**

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository. The characteristics of the MOX spent fuel would be similar to those of normal spent LEU fuel. This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. As directed by the

Geologic problems at Yucca Mountain have not been solved yet, so we can't depend on Yucca Mountain for permanent storage. It has a water problem. 53

The nuclear industry is out of control and is struggling to meet current requirements. There should be no new nuclear reactors; the nuclear industry has outlived its worth. 54

U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository.

PORTLD–53 **Repositories**

As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain, Nevada, is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. Thus, this SPD EIS assumes, for the purposes of analysis, that Yucca Mountain would be the final disposal site for all immobilized plutonium and MOX spent fuel. The suitability of Yucca Mountain as a potential geologic repository for HLW and spent nuclear fuel is beyond the scope of this EIS. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository. DOE submitted the *Viability Assessment for a Repository at Yucca Mountain* (DOE/RW-0508, December 1998) to the President and Congress. Based on the results of the viability assessment, DOE believes that scientific and technical work at Yucca Mountain should proceed to support a decision by the Secretary of Energy in 2001 on whether to recommend the site to the President for development as a potential geologic repository.

PORTLD–54 **Other**

DOE acknowledges the commentor's concern regarding the nuclear industry. DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are

Who makes the decision [*refers to preferred alternative*]? 55

How did DOE arrive at its preferred alternative? How much influence has the nuclear industry had on the decision? 56

subject to the completion of the NEPA process. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program; no new reactors would be built to support the surplus plutonium disposition program. Section 4.28 was revised to discuss the potential environmental impacts of operating Catawba, McGuire, and North Anna, the reactors that would use the MOX fuel.

PORTLD–55 **General SPD EIS and NEPA Process**

The Secretary of Energy will make the decision on surplus plutonium disposition. This decision will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PORTLD–56 **Purpose and Need**

A preferred alternative is the alternative that an agency believes best accomplishes the proposed action, giving consideration to environmental, technical, economic, and other information available at the time. In accordance with CEQ implementing regulations (40 CFR 1502.14(e)), the agency shall identify its preferred alternative, if one or more exists, in the draft EIS and identify such alternative in the final EIS. While DOE has identified its preferences in this SPD EIS, it is open to any new information that may become available and will use this information in making a decision, which will be published in a ROD.

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

As indicated in the revised Section 1.6, SRS is preferred for the proposed surplus plutonium disposition facilities because the site has extensive experience with plutonium processing, and these facilities complement existing

I agree with the preferred alternative to not site missions at Hanford. 57

Are there problems in converting plutonium metals to oxides? 58

DOE should go to 100 percent immobilization of plutonium because it is safer, requires less handling, and is cheaper with fewer hidden costs. Vitrification is the best form for dispositioning surplus plutonium. 59

missions and take advantage of existing infrastructure. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. Nuclear industry comments will be given the same consideration as any other public input.

PORTLD–57 **Alternatives**

DOE acknowledges the commentor's support for the preferred alternative. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–58 **Pit Disassembly and Conversion**

Conversion of plutonium metals to oxides is made through a hydride-oxidation process in which the plutonium metal reacts with hydrogen, nitrogen, and oxygen at controlled temperatures and pressures to produce plutonium dioxide. This process is rather straightforward and would produce plutonium dioxide that can be used for immobilization or fabrication into MOX fuel. A description of the conversion process is provided in Section 2.4.1.2.

PORTLD–59 **Alternatives**

DOE acknowledges the commentor's support for the immobilization-only approach. DOE is committed to public and worker safety during the construction, operation, and deactivation of the proposed surplus plutonium disposition facilities and would implement appropriate controls and procedures to ensure compliance with all applicable Federal, State, and DOE rules, regulations, and requirements.

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against any uncertainties of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for

I am a retired Hanford worker; working on cleanup was my priority. I support the hybrid approach for plutonium disposition, specifically Alternative 4B. I support 33 metric tons of plutonium converted to MOX. Scrap plutonium should be immobilized (7 metric tons). The decision on immobilizing the other 10 metric tons should be delayed until it is better understood. I support the can-in-canister approach. 60

DOE has a history of working with glass for immobilization. Why are we considering shifting to ceramic forms now? 61

reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–60 **Alternatives**

DOE acknowledges the commentor's support of Alternative 4B, which would use the hybrid approach to surplus plutonium disposition. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–61 **Immobilization**

This SPD EIS considers the immobilization of surplus plutonium in two forms, ceramic and glass; both would be produced using similar processes based on a can-in-canister approach. In order to establish a preferred alternative for the immobilized form and focus research efforts, DOE conducted a series of evaluations to determine whether the properties associated with ceramic or glass would be better suited for immobilizing surplus plutonium. Although

Why is DOE considering MOX? MOX waste is more deadly, more radioactive than before. I do not want to see the MOX burn option. MOX is the worst method for disposing of surplus plutonium. It generates additional waste, costs more, and slows the overall disposition process. I oppose plutonium use in commercial reactors. The MOX option should be rejected because of the increased instability of commercial reactors. 62

past analyses have indicated that both ceramic and glass would be acceptable for immobilizing plutonium, these recent studies indicate that the use of ceramic may present certain advantages over glass. The ceramic form was found: to be more resistant to the threat of theft, diversion, or reuse due to the greater difficulty associated with trying to extract plutonium from the ceramic; likely be more durable over a long period of time under geologic repository conditions; to offer reduced exposure risks to workers; and to potentially provide significant cost savings. In addition, the ceramic technology was found to be more flexible in accommodating potential changes in programmatic or technical requirements.

PORTLD–62 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach to surplus plutonium disposition. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

The MOX argument as the only way to make surplus plutonium unavailable is faulty. You can immobilize plutonium, mix it with ceramic, and surround it with high-level waste. It would make the material difficult to get to. 63

Will the [*MOX*] fuel be run through a full cycle, or will it be an "in and out" proposition? 64

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–63 **Alternatives**

DOE acknowledges the commentor's support for immobilization of the surplus plutonium using the ceramic can-in-canister approach. That approach is accorded full consideration in this SPD EIS; DOE has not characterized MOX fuel fabrication and irradiation as the only way to make plutonium unavailable. In fact, DOE has identified as its preferred alternative the hybrid approach of using both immobilization (ceramic form) and MOX fuel fabrication. Pursuing this approach provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

PORTLD–64 **MOX Approach**

As discussed in Chapter 2 of Volume I, MOX fuel would be left in the reactor for a full cycle. Under the current reactor options, there are no plans to leave it there only long enough to meet the Spent Fuel Standard.

Will taxpayer dollars be used to convert materials? Taxpayers will bear the cost of plutonium regardless of where the mission is sited. Taxpayers will be subsidizing nuclear utilities. How much money will be made by private corporations? 65

Why does the United States feel bound to go forward with the most expensive process [*refers to MOX*]? 66

PORTLD–65 **Cost**

The conversion of various plutonium forms to plutonium-oxides suitable for immobilization or use in MOX fuel would be accomplished solely by U.S. Government funds. For plutonium immobilization, the Government pays the entire sum for the disposition, which includes all capital construction and operating costs. For the MOX fuel option, the government is only responsible for the capital costs for the mission. DOE is proceeding on the basis that DCS will pay for operations of the MOX facility and the reactors without significant federal support. It is assumed the private sector will realize its return on investment in the operating phase by securing a lower cost fuel supply. The amount of money to be made by industry would be determined by its business decisions and the terms and conditions it negotiates with DOE for the contract. DOE is entering into a mutually beneficial situation where a competitively bid private company would make a fair profit, gain a useful product, and the U.S. Government dispositions it's surplus plutonium into a form unattractive to terrorist diversion.

PORTLD–66 **Cost**

As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach, which includes both immobilization and MOX fuel, would be more expensive than the immobilization-only approach. However, pursuing the hybrid approach provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

The cost report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at

Taxpayer dollars are supporting MOX when they should support cleanup instead. 67

FMEF saves about $200 million over any other facility at any other site. The high range of savings is $500 million saved if FMEF is used. 68

FMEF value is relative. Retrofitting a building to fit in a different missions is so expensive that any cost savings is lost. 69

http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

PORTLD–67 **Cost**

Funds for the surplus plutonium disposition program and the environmental cleanup program come from different appropriation accounts allocated by the U.S. Congress that cannot be used interchangeably.

PORTLD–68 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–69 **Cost**

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

I am grateful for the United States/Russian decision to reduce nuclear weapons and that the government is pursuing disoposal of surplus plutonium. 70

Is Russia still producing plutonium? Does the United States have a deal with Russia to stop new plutonium production? 71

DOE is splitting hairs on what can actually be produced. Russia has committed to using plutonium. What is the United States gaining? 72

PORTLD–70 **DOE Policy**

DOE acknowledges the commentor's support of DOE and its surplus plutonium disposition program. The United States and Russia are working hard to achieve the objectives of nonproliferation and arms reduction and to ensure secure management of nuclear weapons materials.

PORTLD–71 **Nonproliferation**

Russia is still producing weapons-usable plutonium in the reactors at Tomsk and Krasnoyarsk. The United States is working with Russia to convert those reactors to nonplutonium production reactors.

PORTLD–72 **DOE Policy**

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provided general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials.

Russian cooperation is not the only reason DOE has identified the hybrid approach for the disposition of U.S. surplus plutonium. Pursuing both the immobilization and MOX approaches provides important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

If the United States is truly going to set an example, then it needs to recognize its mistake in using the MOX option. The MOX option violates the long-standing U.S. policy to not use military materials in commercial reactors (nuclear proliferation). A mixed message is sent if the United States expands infrastructure while urging other countries to reduce theirs. The United States needs to take leadership role seriously. Lead by example, no MOX. 73

DOE is committing to a single pass with no reprocessing. Russia has not committed to stopping after one time. What assurance does the United States have that Russia's use will be a one-time passthrough only? Would plutonium be civilian plutonium in Russia after process? 74

PORTLD–73 **DOE Policy**

DOE acknowledges the commentor's opposition to the MOX approach. U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. In keeping with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

PORTLD–74 **Nonproliferation**

Close cooperation between the United States and Russia is essential to achieve the objectives of nonproliferation and arms reduction, and to ensure secure management of nuclear weapons materials. To that end, in late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile. Because each country is responsible for separately dispositioning its own stockpile of surplus plutonium, this statement contains provisions for developing methods and technology for verification. This includes appropriate international verification measures and stringent standards of physical protection, control, and accounting for the management of plutonium. As discussed in Section 2.4, there are provisions for international inspections of each of the proposed

Oregon and Washington and Congress are opposed to MOX. The support is because of the pressure of jobs at Hanford. Is Russia just a bone to get the American public on board with the program? 75

I see a collusion between the nuclear industry, Russia, and the United States. MOX is an attempt by the nuclear industry to subsidize nuclear power. MOX is a bad idea. 76

surplus plutonium disposition facilities. Russia is not committed to a once-through cycle; it has only agreed that it would not reprocess MOX spent fuel until all surplus plutonium was in the form of spent fuel. By that time, it will have verified that the surplus plutonium had been removed from the weapons-usable plutonium stockpile and committed to civilian use.

PORTLD–75 **DOE Policy**

DOE acknowledges the commentor's opposition to the MOX approach. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

Because the Russians have expressed concern that immobilization would not destroy any plutonium, it is conceivable that the Russians would not eliminate their plutonium stockpile if the United States were to implement an immobilization-only approach. Therefore, the hybrid approach provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

PORTLD–76 **DOE Policy**

DOE acknowledges the commentor's opposition to the MOX approach. The use of MOX fuel in commercial, domestic reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by

Can plutonium be extracted from spent fuel and can it be refined into weapons? Is plutonium 241, 242, and 243 included? Which plutonium can be used for a bomb? 77

A weapon was made using reactor-grade plutonium. It was inefficient and hard to make, but proved that it could be done. 78

It's insignificantly more difficult to build a weapon from reactor plutonium than weapons plutonium. Given today's technology with lasers, it is no more difficult. 79

meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

PORTLD–77 **Nonproliferation**

Plutonium has 15 isotopes with mass numbers ranging from 232 to 246. Weapons-usable plutonium contains mainly plutonium 239, with less than 7 percent plutonium 240. Spent fuel contains plutonium 239, 240, 241, and 242. It is possible to extract plutonium 239 from spent fuel, but the process is extremely dangerous, time consuming, and costly because the plutonium is an integral part of massive spent fuel assemblies that emit large doses of radiation.

PORTLD–78 **Nonproliferation**

DOE has no knowledge of a weapon made with reactor-grade plutonium. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. The purpose of the MOX approach is to convert surplus plutonium to a form that meets the Spent Fuel Standard, thereby providing evidence of irreversible disarmament and establishing a model for proliferation resistance. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. While it is possible to extract plutonium from this spent nuclear fuel, the process is extremely dangerous, time consuming, and costly because the plutonium is an integral part of massive spent fuel assemblies that emit large doses of radiation.

PORTLD–79 **Nonproliferation**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. The purpose of the MOX approach is to convert surplus plutonium

House legislature reaffirmed direction in House Bill 3640. DOE should follow the provisions in [*Oregon*] House Bill 3640. 80

Pits classified in weapons is the same type of classification and security in the pit disassembly and conversion facility. I don't think it's safe. We don't need a plutonium bomb, just radioactive materials and a big bomb to kill people. 81

to a form that meets the Spent Fuel Standard, thereby providing evidence of irreversible disarmament and establishing a model for proliferation resistance. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. While it is possible to extract plutonium from this spent nuclear fuel, the process is extremely dangerous, time consuming, and costly because the plutonium is an integral part of massive spent fuel assemblies that emit large doses of radiation. Any discussion of the processes required to build a nuclear weapon is classified and is beyond the scope of this SPD EIS.

PORTLD–80 DOE Policy

DOE acknowledges Enacted Oregon House Bill 3640 relating to nuclear facilities. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–81 DOE Policy

DOE acknowledges the commentor's concern regarding the safety and security of classified nuclear materials. The proposed DOE surplus plutonium disposition facilities are all at locations where plutonium would have the levels of protection and control required by applicable DOE safeguards and security directives. Safeguards and security programs would be integrated programs of physical protection, information security, nuclear material control and accountability, and personnel assurance. Security for the facilities would be implemented commensurate with the usability of the material in a nuclear weapon or improvised nuclear device. Physical barriers; access control systems; detection and alarm systems; procedures, including the two-person rule (which requires at least two people to be present when working with special nuclear materials in the facility); and personnel security measures, including security clearance investigations and access authorization levels, would be used to ensure that special nuclear materials stored and processed

The nuclear premise was that it was helpful to humankind; nuclear is harmful, not helpful. DOE has not accepted or developed a new premise. DOE needs to clean house and bring in people that agree with the new premise. There is a blatant disrespect for life in using nuclear weapons. Nuclear weapons are about power. Nuclear weapons/power is evil. 82

Hanford should be used for MOX fuel fabrication, pit disassembly and conversion, and immobilization. Any new facility for pit disassembly and conversion will contaminate a clean facility. FMEF is built specifically to NRC standards for plutonium work and has a nearly completed MOX fuel line in it. Its use would reduce the timetable. Hanford has the most MOX fuel fabrication experience because the process was developed at Hanford. Hanford has a lower population density than the south and has more distance than SRS between the source and the groundwater. A site infrastructure for plutonium disposition already exists at Hanford. 83

Cleanup is the primary/only mission at Hanford. SRS has a cleanup mission as well as a tritium mission. Hanford can handle more than one mission at a time. 84

inside are adequately protected. Closed-circuit television, intrusion detection, motion detection, and other automated materials-monitoring methods would be employed. Furthermore, the physical protection, safeguards, and security for the MOX facility and domestic, commercial reactors would be in compliance with NRC regulations.

PORTLD–82 **DOE Policy**

DOE acknowledges the commentor's opposition to nuclear weapons. The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. In keeping with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing. The resulting MOX spent fuel would then be placed in a potential geologic repository pursuant to the NWPA, as amended.

PORTLD–83 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities using FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–84 **Alternatives**

DOE acknowledges the commentor's support for new missions at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was

Hanford employment levels dropped by thousands. MOX would create new jobs. We have a right to be concerned about jobs. 85

The decision to not use FMEF is based on "not in my back yard," not technology. 86

Oregon opposes MOX. I am grateful that Oregon represents a sane perspective for disposal and that the SPD EIS does not consider Hanford for the preferred alternative. 87

taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–85 **Alternatives**

DOE acknowledges the commentor's concern about future employment in the Hanford area. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–86 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's concern regarding the decision to not use FMEF at Hanford. The preferred alternative was chosen based on the best information and analyses available to allow for a fair comparison among the candidate sites for the surplus plutonium disposition facilities. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–87 **Alternatives**

DOE acknowledges the commentor's opposition to the MOX approach and support of DOE's decision not to include Hanford as a preferred location for the proposed surplus plutonium disposition facilities. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

My dad worked at Hanford and died of cancer. A friend lives in Idaho near INEEL and most of his family is dead. 88

What is the total spent fuel tonnage? What is the generated waste stream, and how will it be disposed of? How much waste will be created from the MOX process? 89

PORTLD–88 **Human Health Risk**

As discussed in Section 3.2.4.3, epidemiological studies have been carried out on Hanford workers over the years. These studies have consistently shown a statistically significant elevated risk of death from multiple myeloma associated with radiation exposure among male workers. However, the elevated risk was observed only among workers exposed to 10 rads (approximately 10 rem) or more. The studies have also identified an apparent elevated risk of death from pancreatic cancer, but a recent analysis concluded that the risk was not elevated.

As discussed in Section 3.3.4.3, epidemiological studies were also conducted on communities surrounding INEEL to determine whether there are excess cancers in the general population. No excess cancer mortality was reported, and although an excess cancer incidence was observed, no association thereof with INEEL was established. Another study found excess brain cancers in the six counties surrounding INEEL, but a follow-up survey concluded that there was nothing that clearly linked all these cases to one another or to any one thing.

According to the detailed impact assessment presented in Chapter 4 of Volume I, no LCFs are expected as the result of the operations assessed in this SPD EIS. Whatever the alternative, site surveillance and health effects studies would continue throughout the operational period in order to provide a full assessment of impacts on human health.

PORTLD–89 **Waste Management**

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

Estimates of the amounts of TRU, LLW, mixed LLW, hazardous, and nonhazardous wastes that would be generated by construction and operation of the MOX facility are presented in Appendix H.

The Institute for Environmental Research has stated that reprocessing adds more waste, liquid waste. This flies in the face of answers given at this meeting. 90

MOX creates new wastes with no plan for long-term storage; it is not replacement waste. I resent additional input of poison into the environment without any place or way to handle the waste. There are 120 countries asking the United States not to go forward with MOX. 91

Appendixes H.1.2.3, H.2.2.2, H.3.2.2, and H.4.2.3 describe the wastes that would be generated by the MOX facility at Hanford, INEEL, Pantex, and SRS, respectively. These sections also describe facilities that may be used to treat, store, and dispose of these wastes.

PORTLD–90 **Waste Management**

U.S policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons.

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

PORTLD–91 **Waste Management**

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of

DOE has not informed people of all risks and uncertainties in processing plutonium; the SPD EIS does not include necessary impacts and risks. The latest EIS does not contain air quality concerns. 92

implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

PORTLD–92 **Human Health Risk**

Chapter 4 of Volume I provides the results of detailed impact analyses of plutonium processing in the proposed surplus plutonium disposition facilities. Risks and consequences are addressed as appropriate. The impacts on workers and the general population associated with normal operations and postulated accidents are included in these analyses. Included for separate assessment are the potential impacts on air quality and noise, geology and soils, water resources, ecological resources, cultural and paleontological resources, land use and visual resources, infrastructure, waste management, socioeconomics, human health, and transportation. Issues such as environmental justice are also assessed. Detailed analyses of the resources are provided in the appendixes.

Appendix F describes the methods used to perform the evaluations. More detail on facility accident and transportation assessment methods is provided in Appendixes K and L, respectively. These two appendixes also feature discussions of the calculational uncertainties inherent in accident and transportation assessments. All of the assessments for this SPD EIS involved the use of models and techniques that are accepted in the scientific community and have been used in the preparation of numerous other NEPA documents.

Potential air quality impacts associated with each of the alternatives assessed are included in Chapter 4 and discussed in more detail in Appendixes G and J. The incremental concentrations of nonradiological air pollutants were calculated using the ISCST3 computer code. These concentrations are below the appropriate Federal and State ambient air quality standards, indicating that no adverse effects on the environment would be attributable to the surplus plutonium disposition program.

I am concerned about any action that impacts the Columbia River. Will there be groundwater contamination? What's happening to Hanford groundwater with relation to the Columbia River? There are contaminants in the river. There were recent initiatives to coordinate the groundwater program through Bechtel. A report will be coming out to the public by the end of the year. It's the first time a consolidated study will be available. Successful initiatives are underway and there is still a lot of work to do. Hanford, INEEL, and Pantex have about 100 feet of vadose zone above groundwater, and SRS has none. 93

I oppose contaminating any clean land or facility at Hanford. 94

What will the Department do if a MOX reactor explodes? What is the worst case scenario of a reactor accident at a DOE facility? Placing plutonium in the hands of the commercial nuclear industry increases risks, increases transportation, etc. 95

PORTLD–93 **Water Resources**

DOE acknowledges the commentor's concerns regarding groundwater and surface water contamination at Hanford, although the impacts of existing contamination at Hanford are beyond the scope of this SPD EIS. Activities to remediate existing contamination at Hanford are ongoing.

As discussed in Sections 4.26.1.2, 4.26.2.2, 4.26.3.2, and 4.26.4.2, there would be no discernible impacts on surface water or groundwater quality at Hanford, INEEL, Pantex, or SRS from construction and operation of the proposed surplus plutonium disposition facilities.

PORTLD–94 **Alternatives**

DOE acknowledges the commentor's concern regarding potential contamination at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

PORTLD–95 **Facility Accidents**

Design basis and beyond–design basis accidents at the proposed reactors have been evaluated in Section 4.28 of this SPD EIS. As discussed in Section 4.28.2.5, studies by NAS have led it to the following conclusion: "no important overall adverse impact of MOX use on the accident probabilities of the LWRs involved will occur; if there are adequate reactivity and thermal margins in the fuel, as licensing review should ensure, the main remaining determinants of accident probabilities will involve factors not related to fuel composition and hence unaffected by the use of MOX rather than LEU fuel." The analysis reflected in Section 4.28 indicates that the change in risk to the population within 80 km (50 m) of the reactors for the beyond-design-basis accidents involving MOX fuel would range from minus 4 to plus 14 percent. For the design basis accidents, the incremental change in risk from MOX fuel would range from minus 6 to plus 3 percent.

How will materials be transported? How will safety be ensured? What are the transportation accident scenarios? 96

Will Russian plutonium be coming through Oregon? Will Hanford plutonium be coming through Oregon? 97

Will the public know how, when, and where materials will be transported? I oppose transporting materials. 98

PORTLD–96 **Transportation**

Transportation of special nuclear materials, including fresh MOX fuel, would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material. Safety is ensured by compliance with stringent DOE, NRC, and DOT standards for containers, vehicles, and driving. The accident scenarios range from minor accidents that release no hazardous materials to hypothetical, extremely severe accidents. A quantification of the risks associated with these scenarios is presented in Appendix L.

PORTLD–97 **Transportation**

The disposition of Russian plutonium in the United States is not being considered by DOE and is therefore beyond the scope of this SPD EIS. DOE is considering alternatives that include immobilization at SRS, under which the Hanford plutonium would pass through Oregon, as well as alternatives that include immobilization of the surplus plutonium at Hanford, in which it is possible that plutonium from several DOE sites would pass through Oregon. The impacts of transporting nuclear materials to disposition 50 t (55 tons) of surplus plutonium are summarized in Chapter 4 of Volume I and Appendix L. As indicated in Section 2.18, no traffic fatalities from nonradiological accidents or LCFs from radiological exposures or vehicle emissions are expected.

PORTLD–98 **Transportation**

DOE acknowledges the commentor's opposition to transporting materials. The shipment of nuclear material (e.g., depleted uranium) using commercial carriers would be the subject of detailed transportation plans in which routes and specific processing locations would be stipulated. These plans would be coordinated with State, tribal, and local officials. The shipment of waste would be done in accordance with the decisions reached on the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). Transportation of

There is an increased risk of accidents from transporting materials for the MOX option. 99

I am grateful that DOE decided to hold a meeting in Oregon. I am grateful for citizen participation and the opportunity to testify. Oregon needs the opportunity to fully participate. 100

What is DOE doing to inform the American public about what's going on with this program? 101

special nuclear materials would use DOE's SST/SGT system. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, was included in this SPD EIS. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

PORTLD–99 **Transportation**

Transportation would be required for both the immobilization and MOX approaches to surplus plutonium disposition. Transportation of special nuclear materials, including fresh MOX fuel, would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material. The transportation requirements for the surplus plutonium disposition program are evaluated in this SPD EIS. The risk of transporting plutonium materials is presented in Table L–6.

PORTLD–100 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's support of the public outreach program regarding the surplus plutonium disposition program. In compliance with NEPA, DOE provided appropriate opportunities and means for public comment on the program, and gave equal consideration to all comments, regardless of how they were submitted.

PORTLD–101 **General SPD EIS and NEPA Process**

DOE provides information on the disposition of fissile materials to the public in various forms. These include public hearing presentations, fact sheets, exhibits, technical reports, visual aids, and a video. Information is distributed by such mechanisms as mail, email, fax, the MD Web site, telephone, and press interviews. It is important to note that DOE uses most of these same mechanisms to obtain comments from the public as part of its decisionmaking process.

Regarding national security of pit configuration—what does information security mean? I am concerned about making nuclear weapons without a communication process; the Department is bringing down the veil of secrecy again. How will this affect the public process? Will the auxiliary process also be classified? How can the public ensure that the process scope is actually what's proposed in the EIS if information is classified? 102

I object to the structure of the meeting. DOE is taking up comment time. 103

Environmentalists should be allowed on the program. 104

The heart of the issue is that DOE has been lying to the public for 50 years. There are more issues, and the DOE is hurting people no matter what it's talking about. Taxpayers will pay the price of the MOX program. What is DOE going to do for the U.S. public? 105

PORTLD–102 General SPD EIS and NEPA Process

Information security refers to a national security program whereby access to specific information is restricted to individuals who need that information to perform their official duties. DOE has for a number of years been engaged in a formal process to ensure that only information meeting this criterion remains classified. This process should allow for improved public knowledge of the actions being proposed by DOE for surplus plutonium disposition. Two types of information involved in the disposition of surplus plutonium are typically classified: (1) pit information (e.g., the design, construction, and disassembly of individual pit types), and (2) special nuclear material transportation information (e.g., shipping routes and times). It is expected that no other disposition-related processes would be classified, and that, in fact, unclassified processes in the pit conversion, immobilization, and MOX facilities would be subject to international inspection.

PORTLD–103 General SPD EIS and NEPA Process

DOE used an interactive hearing format so that participants could obtain immediate answers to their questions and provide DOE with comments that truly represented their concerns. Written comments were also accepted at these hearings from participants who preferred not to speak. The hearings continued until all participants desiring to speak had the opportunity.

PORTLD–104 General SPD EIS and NEPA Process

NEPA compliance is DOE's responsibility. Environmentalists are encouraged to participate through the comment process.

PORTLD–105 General SPD EIS and NEPA Process

DOE acknowledges the commentor's views on DOE policy and programs. DOE is committed to providing the public with comprehensive environmental reviews of its proposed actions in accordance with NEPA.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost

The most significant fact in the universe is the existence of life; preservation of life is important. We cannot preserve life while endangering others. The nuclear situation began with a lie, and it remains a lie. Biological weapons deterrence is a lie, nuclear weapons deterrence is a lie. All public meetings are a lie. 106

WPPSS is responding to the procurement. 107

Hanford's sole mission should be cleanup, and the mission must remain on schedule. Keep the focus on safety and cleanup at Hanford. Hanford's cleanup job is so large that it requires the undivided attention of the workforce focused on the job. 108

It is pointless to discuss cleaning up wastes if the nuclear industry keeps generating wastes. I would like DOE to comment on the Waste Isolation Pilot Plant (WIPP) site shutdown. What happens to the waste resulting from plutonium disposition? What if Yucca Mountain does not open? There is no long-term storage available. Material needs to be stored in a safe location where no one can get to it. 109

estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

PORTLD–106 General SPD EIS and NEPA Process

DOE acknowledges the commentor's views on the importance of the preservation of life. DOE is committed to providing the public with comprehensive environmental reviews of its proposed actions in accordance with NEPA, and to providing ample opportunity for public comment on those actions.

PORTLD–107 MOX RFP

DOE acknowledges the commentor's observation. Information on the procurement is provided in the revised Section 4.28. WPPSS is not one of the reactors chosen to use MOX fuel.

PORTLD–108 DOE Policy

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–109 Repositories

The management of TRU wastes generated by the proposed surplus plutonium disposition facilities is evaluated in this SPD EIS. DOE alternatives for TRU waste management are evaluated in the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS*

There is a large amount of waste in the ground [*refers to Hanford*]; 450 billion gallons went into the ground; over 1 million gallons/ curies leaked from tanks to the soil. The timeframe to handle materials equals 750 generations; it is too vast of a time to think in. 110

I protest PUREX [*refers to the Plutonium-Uranium Extraction Facility*] and uranium tailings. DOE needs to recognize impacts to Native Americans. Tailings went into the fill below their high school. The Navaho recycle and they use items on their houses that came from the plant. 111

(DOE/EIS-0026-S-2, September 1997). WIPP began receiving shipments of TRU waste for permanent disposal on March 26, 1999. As for MOX spent fuel, following irradiation, the MOX fuel would be removed from the reactor and managed at the reactor site as spent fuel in accordance with the site's normal spent-fuel-handling procedures. This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository. If at some future time it were determined that Yucca Mountain was not a suitable location for these activities, Congress would have to decide on an alternative path forward for the disposal of spent nuclear fuel and other HLW slated for the repository. The immobilized plutonium and MOX spent fuel would be included in any such decision and managed in the same fashion.

PORTLD–110 **DOE Policy**

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

PORTLD–111 **Environmental Justice**

DOE acknowledges the commentor's concern regarding impacts of the surplus plutonium disposition program on Native Americans. However, the PUREX facility and uranium tailings are beyond the scope of this SPD EIS. Impacts on minorities resulting from the surplus plutonium disposition program are analyzed in the Environmental Justice sections of Chapter 4 of Volume I. DOE consulted with Native American groups in the environs of all candidate sites considered in this SPD EIS.

Shut all commercial reactors down. Get rid of nuclear industry. 112

What the government has done to the environment is wrong. The Mesabe Range is completely trashed. Turn away from military-focused missions. Don't bring new materials to the Northwest. We have only one world—don't destroy what we have. It's time to stop the military complex. 113

PORTLD–112 **Other**

DOE acknowledges the commentor's opposition to nuclear power.

PORTLD–113 **Alternatives**

DOE acknowledges the commentor's concern regarding the contamination of the environment resulting from military-focused missions. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

One-hundred percent immobilization does not require gallium removal. The polishing process is not needed. Why was this not included in the analyses? 1

Nonpit materials: can the chosen facility be modified to accommodate a hydride-oxidation process for single processing? Did the Department analyze pit disassembly and conversion without gallium removal, or can it be attached to the facility? 2

IDFALS–1 Plutonium Polishing and Aqueous Processing

The commentor is correct in that immobilization of the full 50 t (55 tons) of surplus plutonium is not anticipated to require a plutonium polishing process to remove gallium concentrations. This SPD EIS analyzed the option to immobilize all the surplus plutonium as discussed in Alternatives 11 and 12. In terms of hybrid alternatives, which also consider plutonium disposition through a combination of immobilization and use as MOX fuel, there has been some discussion that the pit conversion process might not be able to produce plutonium dioxide powder that would consistently meet specifications for MOX fuel. On the basis of public comments received on the SPD Draft EIS and the analysis performed as part of the MOX procurement, DOE has included plutonium polishing as a component of the MOX facility to ensure adequate impurity removal from the plutonium dioxide. Section 2.4.3 and the hybrid alternatives analyses in Chapter 4 of Volume I were revised to include a discussion of plutonium polishing.

IDFALS–2 Plutonium Polishing and Aqueous Processing

The final configuration of the pit conversion facility, which could also process nonpit plutonium metal and oxide, will be based on information collected from the demonstration project under way at LANL. This could include a hydride-oxidation process.

At the time DOE issued the SPD Draft EIS, it believed the gallium content in the plutonium dioxide feed specifications for MOX fuel could be reached using the dry, thermal gallium removal method included in the pit conversion process. However, in response to public interest on this topic and to ensure adequate NEPA review in the event that the gallium specification could not be met with the thermal process, an evaluation of the potential environmental impacts of including a small-scale aqueous process (referred to as plutonium polishing) as part of either the pit conversion or MOX facilities was presented in Appendix N of the SPD Draft EIS. On the basis of public comments received on the SPD Draft EIS, and the analysis performed as part of the MOX procurement, DOE has included plutonium polishing as a component of the MOX facility to ensure adequate impurity removal from the plutonium dioxide. Appendix N was deleted from the SPD Final EIS, and the impacts discussed therein were added to the impacts sections presented for the MOX facility in Chapter 4 of Volume I. Section 2.18.3 was also revised to include the impacts associated with plutonium polishing.

DOE should go with the No Action Alternative and store the material in a secure place. 3

Define a pit. Immobilizing pits could be as little as changing shape? 4

Is it technically possible to attach immobilization to the front end of pit disassembly and conversion? 5

How was the decision made to designate some plutonium for MOX and some for immobilization? 6

IDFALS–3 **Alternatives**

The No Action Alternative would not satisfy the purpose of and need for the proposed action, which is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. DOE has identified as its preferred alternative the hybrid approach (i.e., immobilization and MOX) to surplus plutonium disposition.

IDFALS–4 **Pit Disassembly and Conversion**

A pit, the design of which is classified, is the core component of a nuclear weapon's "primary" or fusion component. The immobilization process is more complicated than just changing the shape of the pits. Changing the shape of the pits would not render the plutonium proliferation resistant or remove the classified nature of the pit. The plutonium, present in pits as metal, must be removed from the other components of the pit and converted to an oxide powder before it can be further processed for disposition. This process would occur at the pit conversion facility. The plutonium dioxide powder would then be transferred to the immobilization facility where it would be mixed with other materials and turned into a ceramic or vitrified form, then loaded into stainless steel cans approximately the size of a coffee can. These cans would then be placed on racks and loaded into HLW canisters which would then be filled with the vitrified HLW.

IDFALS–5 **Pit Disassembly and Conversion**

It is technically possible to locate the two processes together. However, pit disassembly and conversion would have to occur prior to immobilization.

IDFALS–6 **Alternatives**

The amount directed to each option is related to the suitability of the plutonium for use as MOX fuel. In the ROD for the *Storage and Disposition PEIS*, DOE decided that approximately 8 t (9 tons) of the current surplus plutonium were not suitable for use in MOX fuel and therefore would be immobilized. As

I support DOE's efforts to get plutonium off the market. The nuclear proliferation threat is a real danger and must be contained. I advocate full immobilization as the single source disposition method. MOX costs more, has a longer timeframe for startup, and threatens the nonproliferation policy. The Program's goal should be to get rid of plutonium, not to produce electricity. Given these factors, the SPD EIS should address decision factors for determining whether to go to MOX or to full immobilization. This issue needs to be further addressed. 7

described in this SPD EIS, an additional 9 t (10 tons) of surplus plutonium were identified as unsuitable for MOX fuel fabrication. The 17 t (19 tons) of surplus plutonium are not suitable for fabrication due to the complexity, timing, and cost that would be involved in purifying the material. The remaining 33 t (36 tons) of the 50 t (55 tons) of surplus plutonium would be fabricated into MOX fuel.

IDFALS–7 **Alternatives**

DOE acknowledges the commentor's support for the immobilization-only approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Use of MOX fuel in domestic, commercial reactors is not proposed in order to produce electricity. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated

I am amazed at the number of people making their livelihood maintaining problems. MOX as the preferred option falls short. 8

There are a lot of misconceptions in the public about plutonium. Plutonium has always been burned in reactors; there's nothing new about burning plutonium in reactors. The hybrid strategy was chosen in case one of the options fails. 9

with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

IDFALS–8 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

IDFALS–9 **Alternatives**

DOE acknowledges the commentor's support for the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

We know that 17 metric tons must be immobilized, so why is MOX still being considered? What are the factors for determining success or failure? 10

Is the MOX fuel fabrication process designed to fabricate Russian-originated plutonium? 11

The INEEL Citizens' Advisory Board (CAB) researched and considered the MOX decision. We could not reach a consensus, but will continue looking at the issue. The INEEL CAB has concerns about the MOX program. 12

Immobilizing plutonium is disposing $2.5 billion dollars. Taxpayers are throwing money down the hole in the form of glass. DOE is making plutonium available free. Recycling it is not hazardous. It's reducing waste, not adding it. 13

IDFALS–10 **Purpose and Need**

Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

IDFALS–11 **Alternatives**

MOX fuel fabrication is essentially the same regardless of the origin of the plutonium used in the process. The surplus plutonium disposition program proposed in this SPD EIS would only process 50 t (55 tons) of U.S.-origin plutonium.

IDFALS–12 **MOX Approach**

DOE acknowledges the commentor's concern regarding the MOX approach. Decisions on the surplus plutonium disposition program at INEEL will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

IDFALS–13 **Alternatives**

DOE acknowledges the commentor's opposition to the immobilization approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of

Is the end use of MOX to replace highly enriched uranium for power purposes? Is there a commitment from power companies to use MOX? 14

Will the commercial industry's response determine the final decision of whether to use MOX or to go to a 100 percent immobilization option? Does DOE's decision of going to 33 metric tons or 0 metric tons [*for MOX fuel*] depend on commercial end-users? 15

MOX fuel replaces commercial fuel that would exist anyway. The facilities analyzed in SPD EIS are anticipated to classify material to meet WIPP waste acceptance criteria requirements. Shouldn't the MOX facility be a classified facility? 16

implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

IDFALS–14 **DOE Policy**

The MOX approach is not intended to affect the viability of nuclear power. The purpose of the MOX approach is to convert surplus plutonium to a form that meets the Spent Fuel Standard, thereby providing evidence of irreversible disarmament and setting a model for proliferation resistance. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process.

IDFALS–15 **DOE Policy**

Potential users of MOX fuel have been identified by DOE and are part of the DCS team contracted to operate the MOX facility and offer irradiation services in the hybrid approach is selected.

IDFALS–16 **DOE Policy**

It is DOE's policy that the various wastes generated from the surplus plutonium disposition program would meet the performance criteria for disposal at the respective repositories. The feed material for the MOX facility, plutonium dioxide, is made from pits or pure plutonium metal that have been declassified. The MOX fuel produced from the facility (licensable by NRC) would be used in domestic, commercial reactors. Therefore, the MOX facility would not be a classified facility.

I am aware of the economic impact on nuclear energy. I am concerned about the economic impact of MOX. What will the program cost? Who bears the cost? 17

Modifications to commercial reactors will be required for MOX, also relicensing will be required. Who is responsible for paying for this? Any estimate on cost? 18

IDFALS–17 **Cost**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

Because cost issues are beyond the scope of this EIS, this comment has been forwarded to the cost analysis team for response. For a better understanding of the cost and schedule estimates for each alternative, consult *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999). These documents are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

IDFALS–18 **MOX RFP**

DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. As a result of this procurement process, DOE identified the reactors proposed to irradiate MOX fuel, Catawba, McGuire, and North Anna, as part of the proposed action in this SPD EIS. Because commercial reactors in the United States are capable of safely using MOX fuel. DOE believes that the cost to make these reactors suitable for using MOX fuel would be relatively low. The costs would be limited to some analyses and

What is Russia planning to do? Are there agreements in place to ensure that Russia will follow through? 19

What other technologies are being looked at by Russia other than MOX? 20

operating license amendments, and would be reimbursable to the utilities by DOE under the terms of the RFP. Irrespective of the combination of actions implemented, costs to the taxpayer would be associated with the disposition of surplus U.S. plutonium. A separate report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), analyzes the site-specific cost estimates for each alternative. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

IDFALS–19 **Nonproliferation**

The United States and Russia recently made progress in the management and disposition of plutonium. In late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile. The United States does not currently plan to implement a unilateral program; however, it will retain the option to begin certain surplus plutonium disposition activities in order to encourage the Russians and set an international example.

IDFALS–20 **Nonproliferation**

Like the United States, Russia is pursuing studies to address both the immobilization and MOX approaches to surplus plutonium disposition. A feasibility study, in parallel with small-scale testing, is currently under way in Russia to determine the technology to be used to convert Russian plutonium to a form suitable for disposition and international inspection. The Russian pilot-scale study would demonstrate the capability to convert plutonium metal to an oxide form, suitable for either disposition approach (i.e., immobilization or MOX).

Was the United States asked by Russia to assist in funding a safe, secure facility? 21

I have heard of low-enriched uranium or highly enriched plutonium being redirected or lost. There's no indication that the material was ever used. There may be leakage of nuclear materials at the universities in Russia. 22

Don't invest huge sums in the United States until the confidence level in Russia's commitment to do down the MOX path is higher. 23

IDFALS–21 **Nonproliferation**

Understanding the economic dilemma in Russia, the U.S. Congress has appropriated funding for a series of small-scale tests and demonstrations of plutonium disposition technologies jointly conducted by the United States and Russia. For fiscal year 1999 (starting October 1998), Congress further appropriated funding to assist Russia in design and construction of a plutonium conversion facility and a MOX fuel fabrication facility. This funding would not be expended until the presidents of both countries signed a new agreement. Although the amount appropriated by Congress is not sufficient to fund the entire Russian surplus plutonium disposition program, the United States is working with Russia and other nations to resolve this issue.

IDFALS–22 **Nonproliferation**

DOE acknowledges the commentor's concern regarding the safety and security of nuclear materials in Russia. While the quantities and condition of Russian nuclear materials are beyond the scope of this SPD EIS, safeguards and security issues are being addressed in negotiations between the United States and Russia. In late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile. One of the principles of this agreement states acceptable methods and technology for transparency measures, including appropriate international verification measures and stringent standards of physical protection, control, and accounting for the management of plutonium would be developed.

IDFALS–23 **DOE Policy**

DOE acknowledges the commentor's concern regarding investment of U.S. dollars without evidence of Russia's commitment to a MOX approach. The United States and Russia recently made progress in the management and disposition of plutonium. In late July 1998, Vice President Gore and

To what extent will the United States fund pit conversion. Clarify the bounds of the European program. Why does it keep them from handling U.S. fuel? 24

Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country's stockpile. However, in order to avoid putting the United States at a strategic disadvantage in future negotiations with Russia as well as to avoid the large-scale expenditure of funds until necessary, the Administration has made it clear that it will not construct new facilities for disposing of U.S. surplus plutonium unless there is significant progress on plans for plutonium disposition in Russia.

IDFALS–24 **DOE Policy**

The pit disassembly and conversion process recovers plutonium from pits and clean metal and converts the plutonium to an unclassified form. It is a necessary first step for accomplishing plutonium disposition. Funding for the surplus plutonium disposition program is appropriated annually by the U.S. Congress.

The U.S. Government held discussions with the European governments and the European MOX industry concerning this issue. The Europeans are not interested in processing U.S. weapons-usable plutonium in their MOX facilities because their program has reached a balance between the cycle times of the reactors served and the fuel processing and fabrication schedules. The introduction of U.S. surplus plutonium into that balance would disrupt the equilibrium of their fuel cycle, increase plutonium inventories and storage requirements, and increase cost for the European MOX industry. In addition, administrative barriers, including the need to negotiate multiple agreements with other governments, transportation concerns, and working through permit requirements would result in schedule delays in the U.S. surplus plutonium disposition program. This in turn would make it more difficult to reach a surplus plutonium disposition agreement with the Russian government in a timely manner.

Russia lacks the money to go after “Fort Knox” in Russia. There are limited funds for the Russian space program. Russia lacks the money to do anything. I do not think that Russia is going to invest in a multibillion dollar MOX program. 25

When Senator Dominici was visiting in Russia, did he hear that Russia would accept the immobilization process? 26

Both Russia and the United States agree about the benefits of working together and building a relationship between the countries. The United States has good reason to maintain a strong relationship with Russia. 27

IDFALS–25 **Nonproliferation**

The Russian economy is a concern, and the U.S. Congress has appropriated funding for a series of small-scale tests and demonstrations of plutonium disposition technologies jointly conducted by the United States and Russia. For fiscal year 1999 (starting October 1998), Congress further appropriated funding to assist Russia in design and construction of a plutonium conversion facility and a MOX fuel fabrication facility. This funding would not be expended until the presidents of both countries signed a new agreement. Although the amount appropriated by Congress is not sufficient to fund the entire Russian surplus plutonium disposition program, the United States is working with Russia and other nations to resolve this issue.

IDFALS–26 **Nonproliferation**

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. The principles include the acceptance of either the immobilization of plutonium in glass or ceramic form or the consumption of plutonium in MOX fuel in reactors.

IDFALS–27 **DOE Policy**

DOE agrees that close cooperation between the two countries is required to achieve the objectives of nonproliferation and arms reduction, and to ensure secure management of nuclear weapons materials. Toward that end, the United States and Russia recently made progress in the management and disposition of plutonium. In late July 1998, Vice President Gore and Russian Prime Minister Sergei Kiriyenko signed a 5-year agreement to provide the scientific and technical basis for decisions concerning how surplus plutonium will be managed. This agreement enables the two countries to explore mutually acceptable strategies for safeguarding and dispositioning surplus plutonium. During the first week of September 1998, Presidents Clinton and Yeltsin held a Moscow summit and signed a statement of principles with the intention of removing approximately 50 t (55 tons) of plutonium from each country’s stockpile.

Why is DOE planning for new construction adjacent to APSF when it already owns a state-of-the-art facility (FMEF) designed for MOX fuel production? 28

FMEF has design flaws that would be difficult and costly to correct in order to meet the MOX mission. It's much cheaper for the Department to dismantle a "cold" (clean) facility than it is to dismantle a "hot" (contaminated) facility. 29

INEEL has a basic advantage for manufacturing MOX fuel. Why is the Secretary so eager to reach a preferred alternative in siting the facility in the south? 30

INEEL has never been a weapons site or laboratory. In keeping with the "swords to plowshares" intent of the plutonium disposition concept, wouldn't the mission fit better at a nonweapons site, such as INEEL? 31

IDFALS–28 **Alternatives**

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

IDFALS–29 **Alternatives**

DOE acknowledges the commentor's opposition to siting the MOX facility in FMEF at Hanford. DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission, especially in regard to the use of existing facilities.

IDFALS–30 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility at INEEL. As indicated in Section 1.6, SRS is preferred for the MOX facility because this activity complements existing missions and takes advantage of existing infrastructure and staff expertise. Decisions on the surplus plutonium disposition program at INEEL will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

IDFALS–31 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at INEEL. Decisions on the surplus plutonium disposition program at INEEL will be based on environmental analyses, technical and cost reports, national policy and nonproliferation

If all spent fuel rods slated to be moved to Nevada are stored at INEEL on a temporary basis, doesn't it make sense to site the MOX mission at INEEL? 32

The Advanced Mixed-Waste Facility at INEEL is used for TRU waste. DOE is proposing to build a new facility that will ultimately become alpha-contaminated. The facility will be used to contain a small amount of easily contained plutonium. The plutonium disposition program is going to generate more TRU waste. It doesn't make sense. 33

considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

IDFALS–32 **Alternatives**

DOE acknowledges the commentor's support for siting the MOX facility at INEEL. Only 10 lead assemblies would be made and fewer than that number irradiated. Only a small number of rods from those assemblies would be sent for postirradiation examination. This small number of fuel rods that could be stored at INEEL, should the rods be sent to ANL–W for postirradiation examination, does not, on its own, support siting the MOX facility at INEEL.

As discussed in the revised Section 1.6, DOE prefers ORNL for postirradiation examination activities because the site has existing facilities and staff expertise needed to perform postirradiation examination as a matter of its routine activities; no major modifications to facilities or processing capabilities would be required. In addition, ORNL is about 500 km (300 mi) from the reactor site that would irradiate the fuel. Decisions on the surplus plutonium disposition program at INEEL will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

IDFALS–33 **Waste Management**

Although waste generation would be minimized to the extent possible, alternatives for the disposition of surplus plutonium would generate some additional TRU waste. As shown in Section 4.14.2.2, and Appendix H.2.2.3, if both the pit conversion and MOX facilities were located at INEEL, 64 m^3/yr (83 yd^3/yr) of TRU waste would be generated. This is approximately 1 percent of the 6,500-m^3/yr (8,500-yd^3/yr) planned capacity of the Advanced Mixed Waste Treatment Project. In addition, the 640 m^3 (837 yd^3/yr) of TRU waste generated over the 10-year operating period of the surplus plutonium disposition facilities would be less than 1 percent of the 39,300 m^3 (51,400 yd^3) of TRU waste in storage at INEEL.

The SPD EIS is yet another EIS that doesn't answer questions on high-efficiency particulate air filters and their ability to contain exhausts in processing facilities. Air quality questions are not answered regarding particulate filtration. I am concerned about public health and safety if an accident occurs. The general public does not want to be downwind if an accident occurs. Accident analyses need to be put back into air quality permitting. 34

IDFALS–34 **Human Health Risk**

The chemical and radiological emissions associated with each of the proposed surplus plutonium disposition facilities would be processed through HEPA filters prior to their release to the atmosphere. The post HEPA filter emission rates for chemical releases are given in Appendix G, those for radiological releases in Appendix J. These rates represent the source terms analyzed by the computer codes (described in Appendixes F and J) to determine the air concentrations of chemical releases at the site boundary and to determine doses to the public from radiological releases. For chemical releases, the increases in air pollutant concentrations represent small fractions of the Federal and State ambient air quality standards and would be expected to have an insignificant effect on human health. In addition, analyses of the hazardous chemical releases to the atmosphere indicate that no cancers or other adverse health effects to the public or onsite workers would be expected from operations of any of the proposed facilities. For radiological releases, the resulting doses would be well within regulatory limits and would not cause any cancer fatalities. Chapter 4 of Volume I presents these impacts in detail.

If an accident involving chemical releases were to occur, temporary exceedances of ambient air quality standards could occur. The State regulatory agencies would be kept informed of developments, and appropriate actions would be taken in accordance with existing procedures to minimize adverse impacts on the public and workers. No fatal cancers are predicted for any accident having the potential to release radioactive material to the environment.

In response to the commentor's concerns, contacts have been made with the Idaho Division of Environmental Quality and with the contractor responsible for air quality permits for INEEL. There have been no State requirements to perform an accident analysis as part of the air-permitting process regardless of the type of pollutant that could be emitted (criteria pollutants, toxic pollutants, or radionuclides). Only routine operations are considered in the air-permitting process.

Low-level waste disposal is always an ongoing concern. 35

The material would have to be processed through a classification facility (Mixed Waste Facility) before going to WIPP. TRU waste may be processed elsewhere. DOE is committing some facility to being contaminated with TRU waste. 36

I disagree with fatality data from MOX for INEEL. There would be the same impacts from burning [*MOX fuel*] as other reactor fuel. 37

IDFALS–35 **Waste Management**

DOE acknowledges the commentor's concerns regarding LLW disposal. Analyses presented in the Waste Management sections of Chapter 4 of Volume I and Appendix H indicate that there would likely be no major impacts to the LLW disposal infrastructure at the sites. The impacts of LLW disposal are evaluated in detail in the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and in other NEPA documents prepared for the DOE sites.

IDFALS–36 **Waste Management**

As shown in Section 4.14.2.2 and Appendix H.2.2.3, INEEL already has 39,300 m^3 (51,400 yd^3) of TRU waste that will require certification and packaging before shipment to WIPP. The 640 m^3 (837 yd^3) of TRU waste generated over the 10-year operating period of the pit conversion and MOX facilities would be a small addition to the existing waste load at the site and would not be expected to appreciably change the levels of contamination in the TRU waste processing facilities.

IDFALS–37 **Human Health Risk**

DOE acknowledges the commentor's concern about the MOX approach. The commentor raises two separate issues: the fabrication of MOX fuel at INEEL, and the use of MOX fuel in a domestic, commercial reactor at another location.

Human health risks associated with MOX fuel fabrication at INEEL are addressed in Section 4.14. The risk assessments were performed using models accepted within the scientific community: the GENII computer code for the evaluation of normal operations; the MACCS2 code for the accident analysis; and best estimation of input parameters (e.g., radioactive source terms, meteorological conditions, population distributions, and agricultural data).

Section 4.28 was revised to provide reactor-specific analyses and discuss the potential environmental impacts of using a partial MOX core during routine operations and reactor accidents. These impacts have also been

Why wasn't a meeting held in Washington, D.C., for the SPD EIS? Considering the magnitude of the facility, it would seem that given the interest of nationally based groups, that a meeting would be warranted. 38

Will the [*commercial fuel*] plant need to be relicensed? Does the licensing process need to be completed before a commitment is made? 39

Will facility construction begin at the same time as the licensing process? Will MOX fuel fabrication begin before the licensing process is complete? 40

calculated using state-of-the-art computer models. The impacts associated with the use of MOX fuel are similar to those associated with the use of LEU fuel, the typical fuel used in U.S. commercial reactors.

IDFALS–38 **General SPD EIS and NEPA Process**

DOE held public hearings near the potentially affected DOE sites and Washington, D.C. Approximately 1,700 copies of the SPD Draft EIS were mailed, and an NOA letter was mailed to an additional 5,500 members of the public. Approximately 1,300 copies of the *Supplement to the SPD Draft EIS* were mailed, and an NOA postcard was mailed to an additional 5,800 members of the public. Several means were available for providing comments: mail, a toll-free telephone and fax line, and the MD Web site. All comments, regardless of how they were submitted, were given equal consideration.

IDFALS–39 **NRC Licensing**

The MOX facility would be licensed by NRC under 10 CFR 70. This would be a new license, not an amendment to an existing license, because the MOX facility would be a new facility, even if it were located in FMEF at Hanford. If the commentor is referring to a commitment to make MOX fuel, that decision would be made prior to completing, or even commencing, the licensing process. In fact, decisions regarding making MOX fuel, or immobilizing all the surplus plutonium will be made in the ROD for this SPD EIS. Theoretically, a facility could be completely constructed prior to issuance of a Part 70 license, but it would not be practical or prudent to do so. NRC must approve the safety and environmental reports, and the plant features relating to criticality and nuclear safety. Therefore, it would be in the best interest of the facility owners and operators to work closely with NRC during the design and construction process to ensure that NRC approves of the way its requirements are being met. However, MOX fuel fabrication will not begin before a license is issued for the MOX facility because special nuclear materials cannot be brought into the facility before the license is issued.

IDFALS–40 **NRC Licensing**

Fabrication of MOX fuel would not begin until a license was issued for the MOX facility under 10 CFR 70, because special nuclear materials may not be brought into an unlicensed facility. Theoretically, a facility could be completely

If DOE goes down the MOX path, and commercial reactors never burn MOX fuel, what then? Where will the MOX fuel be stored? Where besides Yucca Mountain? I am concerned about going down the path of investing and manufacturing MOX fuel and then not burning the fuel if communities resist. WIPP is a long ways off. DOE needs contingency planning for these issues. 41

constructed prior to issuance of a 10 CFR 70 license, but that would not be practical. NRC must approve the safety and environmental reports, as well as the plant features relating to criticality and nuclear safety. Therefore, it would be in the best interests of the facility owners and operators to work closely with NRC during the design and construction process to ensure that NRC approved of the way its requirements were being met.

IDFALS–41 **DOE Policy**

DOE conducted a procurement process to acquire MOX fuel fabrication and irradiation services. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. It is highly unlikely that fresh fuel would be fabricated for a reactor and then not irradiated by that reactor. Such a condition would be a contractual default by DCS, and would have to be remedied at DCS expense. Speculation as to the DCS response to this highly unlikely scenario would center on two courses of action: it could return the fuel to the fabricator for reuse in the fabrication of fuel for sister DCS reactors, or more likely, it could ship the MOX assemblies directly to sister reactors for use there (the reactor fuels would probably be interchangeable). Whatever its ultimate disposition, of course, the fresh fuel would at all times be subject to stringent security controls.

The resulting spent nuclear fuel would be placed in a potential geologic repository pursuant to the NWPA, as amended. This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository.

TRU and mixed waste would be certified on the site to current WIPP waste acceptance criteria prior to shipment to WIPP for disposal. DOE alternatives

I agree that DOE is supposed to take back the spent fuel (in a repository). A lawsuit is out on behalf of commercial reactors because Yucca Mountain is not open. Is it a possibility that the Consortium could tell DOE to take the MOX fuel back? 42

WIPP is not open, and may not have the capacity if it does open. I do not know if WIPP is expandable. WIPP is not large enough to handle the current TRU waste inventory. 43

for TRU waste management are evaluated in the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). WIPP began receiving shipments of TRU waste for permanent disposal on March 26, 1999. DOE does not envision fresh fuel going directly to WIPP nor MOX spent nuclear fuel going anywhere but to Yucca Mountain. Section 4.28 was revised to discuss the potential environmental impacts of the reactors that would use the MOX fuel, and Section 1.8.2 describes the environmental documents associated with Yucca Mountain and WIPP.

IDFALS–42 **DOE Policy**

Operating criteria for the MOX facility stipulates that fabrication of the fuel shall meet the reactor demand schedules. However, to avoid excessive inventory at the fuel fabrication facility and the reactors, fuel would not be fabricated more than 18 months in advance of shipment to the reactor, and the fresh fuel would not be stored at the reactor site longer than the current and next scheduled reload. After irradiation, the MOX fuel would be removed from the reactor and managed with the rest of the spent fuel from the reactor, eventually being disposed of at a potential geologic repository built in accordance with the NWPA, as amended. This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository.

IDFALS–43 **Repositories**

The management of TRU wastes generated by the proposed surplus plutonium disposition facilities is evaluated in this SPD EIS. DOE alternatives for TRU waste management are evaluated in the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*

What is the status with triple play [*refers to tritium production*]? 44

I am open-minded as to the future of the nuclear industry. 45

We need State rights to veto projects. 46

Senators are bought by nuclear advocates. 47

(DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). WIPP began receiving shipments of TRU waste for permanent disposal on March 26, 1999. As described in Appendix F.8.1 and the Waste Management sections in Chapter 4 of Volume I, it is conservatively assumed that TRU waste would be stored at the candidate sites until 2016, at which time it would be shipped to WIPP in accordance with DOE's plans. Expected TRU waste generated by the proposed facilities is included in the *WIPP Disposal Phase Final Supplemental EIS* cumulative impacts estimates, as well as in *The National TRU Waste Management Plan* (DOE/NTP-96-1204, December 1997).

IDFALS–44 **DOE Policy**

The "triple play," where MOX fuel fabricated from surplus plutonium would be used in a reactor to make tritium and generate electricity was analyzed in the *Final Programmatic Environmental Impact Statement for Tritium Supply and Recycling* (DOE/EIS-0161, October 1995). In May 1999, the Secretary of Energy decided that TVA's Watts Bar and Sequoyah reactors would produce a future supply of tritium (64 FR 26369). Therefore, the triple play option is no longer under consideration.

IDFALS–45 **Other**

DOE acknowledges the commentor's position regarding the future of the nuclear industry.

IDFALS–46 **Other**

DOE acknowledges the commentor's view that States should have the right to veto decisions made on the surplus plutonium disposition program. DOE has been charged by the U.S. Congress with determining how surplus plutonium will be dispositioned. Public input is a crucial component of this decisionmaking process. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

IDFALS–47 **Other**

DOE acknowledges the commentor's concern.

The United States should not be so dependent on fossil fuel. With more knowledge, people wouldn't be so afraid of nuclear power. 48

Is MOX utilization based on pure economics? 49

Was an economic analysis between highly enriched uranium and MOX performed? With a smaller quantity of fuel, is it cost effective to do? 50

IDFALS–48 **Other**

DOE acknowledges the commentor's support for nuclear power. However, the purpose of the surplus plutonium disposition program is not to generate energy. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner.

IDFALS–49 **Cost**

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

IDFALS–50 **Cost**

No economic comparison of MOX and HEU fuels was conducted in conjunction with this SPD EIS. HEU is dedicated to defense purposes only. Because cost issues are beyond the scope of this EIS, this comment has been forwarded to the cost analysis team for response. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

The current Administration is strictly antinuclear. The Russians consider plutonium a national treasure, and the United States should as well. 51

The United States should be using spent fuel for power. The nuclear industry is the safest source of power. We need to turn trend around and revitalize industry. 52

IDFALS–51 **DOE Policy**

DOE acknowledges the commentor's concern regarding the value of surplus plutonium. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. However, not all of the surplus plutonium would be made into MOX fuel because some of it is not suitable for fabrication due to complexity, timing, and cost that would be involved in purifying the material. Furthermore, pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again. Decisions on the surplus plutonium disposition program will be based on national policy and nonproliferation considerations, environmental analyses, technical and cost reports, and public input.

IDFALS–52 **DOE Policy**

U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. Therefore, the United States will not build an inventory of plutonium that has been separated from commercial irradiated fuel.

DOE should plan to save plutonium in spent fuel and should use this fuel for environmental and economic reasons. 53

How did you arrive at the figure for TRU waste? 54

We need some means for recovering fuel. We need interim storage, not permanent storage. 55

The RFPs are due in September and will be awarded in November. Isn't this inconsistent with the overall timescale? 56

IDFALS–53 **DOE Policy**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel.

IDFALS–54 **Waste Management**

The waste generation data used in this SPD EIS were obtained from data reports prepared by the DOE national laboratories. The TRU waste volumes in these reports were estimated from process knowledge, or obtained by extrapolation of information on TRU waste generation at similar existing facilities. Supporting reports are available in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

IDFALS–55 **DOE Policy**

This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository. Section 122 of the NWPA requires DOE to maintain the ability to retrieve emplaced materials. Therefore, DOE would maintain the ability to retrieve spent nuclear fuel and HLW for at least 100 years, and possibly as long as 300 years.

IDFALS–56 **MOX RFP**

Fabrication of MOX fuel would not begin until a license was issued for the MOX facility under 10 CFR 70, because special nuclear materials may not be brought into an unlicensed facility. Theoretically, a facility could be completely constructed prior to issuance of a 10 CFR 70 license, but that would not be practical. NRC must approve the safety and environmental reports, as well as the plant features relating to criticality and nuclear safety. Therefore, it would be in the best interests of the facility owners and operators to work closely with NRC during the design and construction process to ensure that NRC approved of the way its requirements were being met.

continue for up to 4 years, the information from the demonstration would be generated, gathered, and be available on a continuous basis throughout the facility design phase. This demonstration project and other R&D projects are described in the *Pit Disassembly and Conversion Demonstration EA* (DOE/EA-1207, August 1998), which is available on the MD Web site at http://www.doe-md.com.

7 **Alternatives**

DOE acknowledges the commentor's concern for potential shortcomings in the surplus plutonium disposition program. While it is correct that the disposition of large quantities of plutonium is a new endeavor, the various disposition alternatives are not. Several countries, including Russia and the United States have experience with immobilizing high-level wastes and the proposed can-in-canister approach, using ceramic instead of glass, offers advantages in the areas of proliferation resistance, repository durability, lower worker radiation exposure during processing, and cost effectiveness.

Commercial reactors in the United States are capable of safely using MOX fuel without any physical modifications to the reactor vessel or supporting systems. (Operating procedures, fuel management plans, and other activities would need to be modified.) The MOX technology is used in Europe, and therefore does not require extensive research and development for implementation in the United States. The R&D effort would be concentrated on fabricating samples of MOX fuel and conducting limited experiments and tests on those samples to assess fuel performance. The main objectives of this effort by DOE are to ensure that the plutonium and uranium feed materials will produce acceptable MOX fuel and to examine key issues relative to the performance of MOX fuel in commercial reactors.

Letter Expressing Support for Locating Disassembly and Conversion of Nuclear Weapons Plutonium Components at the Pantex Plant
Page 1 of 1

U.S. Department of Energy
Office of Missile Materials Disposition
MD-4 Forrestal Building
1000 Independence Avenue, SW
Washington D.C., 20585

As a citizen of Amarillo, I wish to express my feeling about the location of the disassembly and conversion of nuclear weapons plutonium components("pits") at the Amarillo Pantex Plant. I am totally in support of this function and hope you will consider the effort and the history of the Pantex plant in your decision making process for this site. 1

Sincerely,

Signature

Address

1 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

Petition Expressing Opposition to Mixed Oxide Fuel Transportation Across the United States
Page 1 of 3

Petition / Opposed to MOX fuel transportation across the U.S.

We, the undersigned, are opposed to the fabrication and transportation of mixed oxide fuel (MOX), to be created from U.S. bomb plutonium. We oppose this government initiative because plutonium fuel, or MOX, presents many serious problems including: 1

1. Plutonium would be transported through the thumb area, the heart of the Great Lakes Region. Transport accidents would endanger millions of citizens and our precious environment.

2. Plutonium is a radioactive substance that lasts for thousands of years and one-millionth of a gram of plutonium can be lethal to a human being. 2

3. Use of MOX turns plutonium into high-level atomic waste, for which no safe storage solution is known. 3

4. The MOX program would allow foreign corporations to have significant control over plutonium - the most sensitive material in nuclear weapons - and would contradict more than 20 years of U.S. nuclear non-proliferation policy. 4

Full Name (please print)	Address	Signature (written)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Send completed petitions to: CAP, Citizens For a Healthy Planet, P.O. Box 335, Emmett, Mi. 48022

1 MOX Approach

DOE acknowledges the commentor's opposition to the MOX approach to surplus plutonium disposition. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. Section 4.28 was revised to discuss the potential environmental impacts of operating Catawba, McGuire, and North Anna, the reactors that would use the MOX fuel.

The transportation of surplus plutonium through the Great Lakes Region is beyond the scope of the proposed action analyzed in this SPD EIS. Shipments of a small quantity of MOX fuel from LANL to Canada were part of a separate proposed action. DOE has prepared an *Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment* (DOE/EA-1216, January 1999) and FONSI, signed August 13, 1999, on fabrication of the MOX fuel and its transportation to Canada. The transportation analyses in the Parallex EA indicate that no serious health effects would occur due to the transport of MOX fuel. This EA and FONSI can be viewed on the MD Web site at http://www.doe-md.com.

Transportation would be required for both the immobilization and MOX approaches to surplus plutonium disposition. Transportation of special nuclear materials, including fresh MOX fuel, would use DOE's SST/SGT system as described in Appendix L.3.2. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material.

2 Human Health Risk

The small radiological release quantities expected from each of the proposed surplus plutonium disposition facilities are presented in the Source Term Data sections of Appendix J. The Atomic Energy Act of 1954 authorizes DOE to establish standards to protect health and minimize dangers to life. Radiation protection standards are based on controlling radioactive releases to ALARA levels in recognition of the potential risk of radiation exposure. The small cancer risks presented in this SPD EIS are a direct result of the small quantities of material (plutonium, etc.) expected to be released from the facilities. Calculation of these cancer risks is based on methodologies presented in the accredited National Research Council's publication *Health Effects of Exposure to Low Levels of Ionizing Radiation BEIR V* (1990). As is shown in the radiological impact tables in Chapter 4 of Volume I, the cancer risk (associated with the estimated plutonium releases) to members of the public is well below one, thus demonstrating that the quantity of plutonium released would not be close to the amount associated with causing a fatality.

3 **Repositories**

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository.

4 **Nonproliferation**

The DOE contract under which DCS would provide MOX fuel fabrication and irradiation services has very specific provisions that would not allow foreign corporations or governments to have control over the surplus plutonium or have the ability to access any sensitive U.S. technology information. Prior to awarding the contract, a National Interest Determination and a Foreign Ownership Control and Influence Determination were made to ensure that there would be, among other things, no breach of nonproliferation policy.

PETITION EXPRESSING SUPPORT FOR SITING THE PIT DISASSEMBLY AND CONVERSION FACILITY AT THE PANTEX PLANT
PAGE 1 OF 1

PETITION

We, the undersigned, believe it is in the best interests of our country and the Department of Energy, to site the Pit Disassembly and Conversion Facility at the Pantex Plant in Amarillo, Texas. 1

1 **Alternatives**

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

PROTECT the Mission at Pantex!

An accident at the proposed Pit Disassembly and Conversion Facility (PDCF) could contaminate and close the nuclear weapon disassembly and pit storage missions at Pantex. We petition President Bill Clinton and the Department of Energy not to risk the much more important weapon disassembly mission. Please do not site the PDCF at Pantex. 1

Name	Address	City/ZIP

Original: Copy sent to President Clinton

1 **Facility Accidents**

DOE acknowledges the commentor's opposition to siting the pit conversion facility at Pantex. The accident risks associated with constructing and operating the pit conversion facility at Pantex are described in the Facility Accidents sections in Chapter 4 of Volume I and in Appendix K. The most severe design basis accidents were analyzed, and no LCFs in the general population would be expected to result. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

Postcard Citing Savings From Consolidating All of DOE's Plutonium Disposition Missions at the Savannah River Site
Page 1 of 1

Dear Secretary Peña:

As I'm sure you know, a decision to consolidate all of DOE's plutonium disposition missions at the Savannah River Site would result in a near-term capital cost savings of over $500 Million and a total life cycle savings of about $1.6 Billion. 1

I and taxpayers throughout the nation will thank you for keeping our interests in mind when you make your plutonium decisions later this year.

Thank-You,

Signature

County of residence/affiliation

1 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at SRS. As indicated in the revised Section 1.6, SRS is preferred the proposed facilities because the site has extensive experience with plutonium processing, and these facilities complement existing missions and take advantage of existing infrastructure.

Because this comment relates directly to the cost analysis report, it has been forwarded to the cost analysis team for consideration. The *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS and Washington, D.C.

Dear Mr. Secretary:

As you already know, consolidating the DOE's plutonium disposition missions at the Savannah River Site—pit disassembly and conversion, MOX fuel fabrication and immobilization—will save millions of dollars by reducing or eliminating operating costs of other DOE mission sites. 1

As a resident of the Central Savannah River Area, I can assure you that these missions are wanted and community support is strong.

Thank-You,

Signature

County of residence/affiliation

1 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at SRS. As indicated in the revised Section 1.6, SRS is preferred the proposed facilities because the site has extensive experience with plutonium processing, and these facilities complement existing missions and take advantage of existing infrastructure.

Because cost issues are beyond the scope of this SPD EIS, this comment has been forwarded to the cost analysis team for consideration. The *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998) report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS and Washington, D.C.

POSTCARD EXPRESSING OPPOSITION TO PLUTONIUM PROCESSING IN THE TEXAS PANHANDLE AND CONVERTING MILITARY PLUTONIUM FOR USE IN MIXED OXIDE FUEL
PAGE 1 OF 1

☑ **YES!** **Keep Texas Panhandle water, air, and soil safe from radioactive pollutants** 1

☑ **NO!** **To any plutonium processing in the Texas Panhandle** 2

☑ **YES!** **To minimal handling and processing of plutonium and other nuclear materials** 3

☑ **NO!** **To converting military plutonium for use in mixed oxide (MOX) fuel** 4

Signed: ______________________________

1 **Alternatives**

Sections 4.17, among others, and 4.26.3 describe the potential effects of the maximum impact alternative on air quality, water resources, and soil. These analyses indicate that the impacts of construction and normal operation of the pit conversion and MOX facilities on air, water, and soil at Pantex would likely be minor.

2 **Alternatives**

DOE acknowledges the commentor's opposition to the surplus plutonium disposition program at Pantex. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

3 **DOE Policy**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. DOE is committed to public and worker safety during the construction, operation, and deactivation of the proposed surplus plutonium disposition facilities, and would implement appropriate controls and procedures to ensure compliance with all applicable Federal, State, and local laws, rules, regulations, and requirements.

4 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach to surplus plutonium disposition. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Postcard Expressing Support for DOE's Plutonium Disposition Missions at the Savannah River Site and View That Excess Plutonium Can Be Converted into Mixed Oxide Fuel to Help Meet U.S. Electrical Energy Needs
Page 1 of 1

Dear Secretary Peña:

The Savannah River Site is ready to serve the nation in meeting its need to dispose of excess plutonium from nuclear weapons.

We know this plutonium can be converted into MOX fuel to help meet our electrical energy needs for years to come. We view plutonium as an important national resource not as a waste material, and we welcome DOE's plutonium disposition missions at the Savannah River Site.

We're prepared to do it all -- pit disassembly and conversion, MOX fuel fabrication and immobilization. We look forward to the opportunity to accomplish these missions at one of the safest and most proven facilities in the DOE complex. 1

Thank-You,

Signature

County of residence/affiliation

1 **Alternatives**

DOE acknowledges the commentor's support for siting the proposed surplus plutonium disposition facilities at SRS. As indicated in the revised Section 1.6, SRS is preferred for the proposed facilities because the site has extensive experience with plutonium processing, and these facilities complement existing missions and take advantage of existing infrastructure. Decisions on the surplus plutonium disposition program at SRS will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

US DOE needs to hear your voice NOW!

1. Should Clean Up be the sole mission at Hanford? 1
   Yes No

2. Should the United States Government maintain its longstanding policy against the use of weapons Plutonium to fuel civilian nuclear reactors? 2
   Yes No

3. Which alternative would you prefer to see the US Department of Energy pursue: 3
   Immobilization (encasement of plutonium in glass-like tombs)
   Or
   The MOX plan (burning plutonium to fabricate fuel for use in a civilian nuclear reactor)?

4. Should Plutonium, to be used for processing and fabrication of MOX fuel, be imported to the Hanford site along the Columbia River?
   Yes No

5. How concerned are you about the transportation of Plutonium through the Northwest? 4
   Not concerned slightly concerned very concerned completely opposed
   B. How concerned are you about the transport through the Northwest of fuel containing weapons Plutonium?
   Not concerned Slightly concerned Very concerned Completely opposed

6. Should commercial nuclear power plants be allowed to run on MOX fuel containing weapons Plutonium? 5
   Yes No
   B. Should they be subsidized with tax dollars to do so?
   Yes No

7. Should MOX fuel containing weapons Plutonium be used to restart the FFTF reactor at Hanford to produce Tritium for nuclear bombs? 6
   Yes No

Name____________________
Address____________________
Phone____________________

Please return this to:
Hanford Action
25-6 NW 23rd Place #406
Portland, OR 97214
(503) 235-2531

1 DOE Policy

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

2 Nonproliferation

U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

3 Alternatives

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of

U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Under the hybrid approach, approximately 33 t (36 tons) of clean plutonium metal and oxides would be used to fabricate MOX fuel, which would be irradiated in domestic, commercial reactors. DOE has determined that 17 t (19 tons) of the surplus plutonium would be immobilized due to the complexity, timing, and cost that would be involved in purifying those plutonium materials to make them suitable for use in MOX fuel. Therefore, fabricating all 50 t (55 tons) of surplus plutonium into MOX fuel is not considered a reasonable alternative at this time and is not analyzed; however, immobilizing all of the surplus plutonium is analyzed. Given the variability in purity of the surplus plutonium to be dispositioned, some of the plutonium currently considered for MOX fuel fabrication may also need to be immobilized. The incremental impacts that would be associated with a small shift in materials throughput are discussed in Section 4.30.

4 Transportation

The shipment of nuclear material (e.g., depleted uranium) using commercial carriers would be the subject of detailed transportation plans in which routes and specific processing locations would be discussed. These plans are coordinated with State, tribal, and local officials. The shipment of waste would be in accordance with the decisions reached on the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). The transportation of special nuclear materials is the subject of detailed planning with DOE's Transportation Safeguards Division. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in this SPD EIS. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

5 **MOX Approach**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

6 **DOE Policy**

As discussed in Appendix D of the SPD Draft EIS, DOE did consider FFTF in the *Storage and Disposition PEIS*, but it was eliminated from further study because it was in a standby status and it could not satisfy the criterion of completing the disposition mission within 25 years using the historic FFTF plutonium enrichment specifications. In December 1998, the Secretary of Energy decided that FFTF would not play a role in producing tritium. As discussed in Section 1.7.4, Appendix D was deleted from the SPD Final EIS because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source.

QUESTIONNAIRE–HANFORD ACTION OF OREGON
PAGE 1 OF 3

The U.S. Department of Energy needs to hear you voice NOW!
What do you think about a new era of nuclear proliferation?

Hanford Action of Oregon will forward this questionnaire to USDOE. Please circle your responses.

1. Should clean-up be the sole mission at Hanford? 1
   Yes No

2. Should the United States government maintain its longstanding policy opposing the use of weapons plutonium to fuel civilian nuclear reactors? 2
   Yes No

3. Should commercial nuclear reactors be allowed to run on MOX fuel containing weapons-grade plutonium? 3
   Yes No

3a. Should they be subsidized with tax dollars to do so?
   Yes No

4. Which alternative would you prefer to see the U.S. Department of Energy pursue: 4
   Immobilization (encasement of plutonium in glass logs or in cannisters for entombment)
   OR
   The MOX plan (processing plutonium into fuel for use in civilian nuclear reactors).

5. How concerned are you about the transportation of plutonium through the Northwest to Hanford? 5
   Not concerned Slightly Concerned Very Concerned Completely opposed

6. How concerned are you about transporting plutonium MOX fuel through the Northwest to Hanford?
   Not concerned Slightly Concerned Very Concerned Completely opposed

7. Should MOX fuel be used to restart the Fast Flux Text Facility (FFTF), a risky liquid-metal reactor at Hanford, to produce tritium for nuclear bombs? 6
   Yes No

Name ______________________________

Address ______________________________

Phone ________________ e-mail ____________

Please return to Hanford Action of Oregon by September 10, 1998.

Hanford Action of Oregon
25-6 NW 23rd Pl. #406 tel: (503) 235-2924 fax: (503) 736-0097 e-mail: hannie@aol.com

1 DOE Policy

DOE believes that Hanford's efforts should remain focused on its current high-priority cleanup mission. The importance of cleanup at Hanford was taken into consideration in identifying preferred sites for surplus plutonium disposition activities. However, no decision has been made, and DOE will continue to consider Hanford for surplus plutonium disposition or other programs that are compatible with the Hanford mission.

2 Nonproliferation

U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program.

3 MOX Approach

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

4 **Alternatives**

DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Under the hybrid approach, approximately 33 t (36 tons) of clean plutonium metal and oxides would be used to fabricate MOX fuel, which would be irradiated in domestic, commercial reactors. DOE has determined that 17 t (19 tons) of the surplus plutonium would be immobilized due to the complexity, timing, and cost that would be involved in purifying those plutonium materials to make them suitable for use in MOX fuel. Therefore, fabricating all 50 t (55 tons) of surplus plutonium into MOX fuel is not considered a reasonable alternative at this time and is not analyzed; however, immobilizing all of the surplus plutonium is analyzed. Given the variability in purity of the surplus plutonium to be dispositioned, some of the plutonium currently considered for MOX fuel fabrication may also need to be immobilized. The incremental impacts that would be associated with a small shift in materials throughput are discussed in Section 4.30.

5 **Transportation**

The shipment of nuclear material (e.g., depleted uranium) using commercial carriers would be the subject of detailed transportation plans in which routes and specific processing locations would be discussed. These plans are coordinated with State, tribal, and local officials. The shipment of waste would be in accordance with the decisions reached on the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). The transportation of special nuclear materials is the subject of detailed planning with DOE's Transportation Safeguards Division. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in this SPD EIS. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

6 **DOE Policy**

As discussed in Appendix D of the SPD Draft EIS, DOE did consider FFTF in the Storage and Disposition PEIS, but it was eliminated from further study because it was in a standby status and it could not satisfy the criterion of completing the disposition mission within 25 years using the historic FFTF plutonium enrichment specifications. In December 1998, the Secretary of Energy decided that FFTF would not play a role in producing tritium. As discussed in Section 1.7.4, Appendix D was deleted from the SPD Final EIS because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source.

Chapter 4
Comment Documents and Responses on the *Supplement*

This chapter presents scanned images or transcriptions of all oral or written comments submitted to DOE on the *Supplement*, with the DOE responses. In most instances, the response appears on the same page as the corresponding comment. Where many comments appear on a single page, however, the responses may extend to succeeding pages. The comments and responses are presented in the following order:

- Comments from Federal agencies.
- Comments from special interest groups and organizations from foreign countries. The comments are integrated alphabetically by country.
- Comments from State and local officials and agencies, special interest groups, organizations, companies, and individuals. The comments are integrated alphabetically by State.
- Oral comments recorded at the Washington, D.C. public hearing.
- Campaign statement of 126 nongovernmental organizations.

UNITED STATES DEPARTMENT OF THE INTERIOR
WILLIE R. TAYLOR, WASHINGTON, D.C.
PAGE 1 OF 1

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

150 U.S. Department of the Interior 1849•1999

ER 99/428

JUN 23 1999

Laura S. H. Holgate
Director
Office of Fissile Materials Disposition
U. S. Department of Energy
P.O. Box 23786
Washington, DC 20026-3786

Dear Ms. Holgate:

The United States Department of the Interior has reviewed the supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement (EIS) and offers the following comments.

The proposal would include use of MOX fuel at existing reactors, with no new construction and no significant change in emissions. Accident risks and containment measures are described in the document; the associated risks to ecological systems would probably be similarly low as those described for humans. Since the use of MOX fuel in existing reactors would not be expected to result in any impacts to ecological resources, including listed species, we would concur with a "no effect" determination. 1

Thank you for the opportunity to review the draft EIS.

Sincerely,

Willie R. Taylor
Director
Office of Environmental Policy
and Compliance

MR015

MR015–1 **MOX Approach**

DOE acknowledges the Department of Interior's agreement that the use of MOX fuel in existing, commercial reactors would have "no effect" on ecological resources.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RICHARD E. SANDERSON, WASHINGTON, D.C.
PAGE 1 OF 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

JUL 2 1999

Ms. Laura H. Holgate
Director
Office of Fissile Materials
Disposition
U.S. Department of Energy
P. O. Box 23786
Washington, D.C. 20026-3786

Re: Surplus Plutonium Disposition Supplement

Dear Ms. Holgate:

In accordance with the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.) and Section 309 of the Clean Air Act, the Environmental Protection Agency (EPA) has reviewed the Department of Energy Surplus Plutonium Disposition Supplement to the Draft Environmental Impact Statement (SEIS). The SEIS provides the preferred sites for the pit disassembly and plutonium conversion facility; the lead assembly fabrication; the immobilization facility; the mixed oxide fuel facility (MOX); and post-irradiation examination. Also included in this SEIS is a synopsis of DOE's environmental critique of the data submitted by the contractor. EPA commends DOE for providing this additional information. However, the issues addressed in our September 16, 1998 letter on the DEIS are not addressed and therefore remain the same. 1

We appreciate the opportunity to comment on the proposed project. If you have any questions please contact me (564-2400) or Marguerite Duffy (564-7148).

Sincerely,

Richard E. Sanderson
Director
Office of Federal Activities

Internet Address (URL) • http://www.epa.gov
Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 20% Postconsumer)

MR026

MR026–1 **General SPD EIS and NEPA Process**

Issues raised in EPA's previous letter are addressed in Volume III, Chapter 3.

Campaign for Nuclear Phaseout / Campagne contre l'expansion du nucléaire
412-1 rue Nicholas St., Ottawa, Ontario K1N 7B7 Tel: (613) 789-3634 Fax: (613) 241-2292 cnp@web.net

June 28, 1999

U.S. Department of Energy
Office of Fissile Material Disposition
c/o Supplement to SPD EIS
P.O. Box 23786
Washington, DC 20026-3786

To the Office of Fissile Material Disposition:

The enclosed documentation and remarks contained herein are submitted in connection with the Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement.

I am writing on behalf of the Campaign for Nuclear Phaseout (CNP), a coalition of Canadian environmental groups concerned with the environmental, economic and strategic impacts of nuclear technology and nuclear power generation. Over 300 organizations representing a diverse cross-section of Canadians have endorsed the Campaign for Nuclear Phaseout. Supporting organizations and individuals reside in every province and territory in Canada.

CNP has a number of concerns related to the plan to import plutonium from American weapons stockpiles into Canada for the purposes of a "test-burn" at Chalk River Laboratories. For the reasons outlined below, it is our position that shipments of MOX fuel to Canada (for the purpose of a test burn or for other reasons) should not be approved. To date, no public consultations have been held in Canada. Additionally, the Government of Canada has not provided a clear explanation of the issues surrounding this project nor has reliable information about the project been made available.

Moreover, the crown corporation, Atomic Energy of Canada Limited (a principle proponent) has frequently provided misinformation on the project. For example, a spokesperson designated to speak on AECL's behalf has stated on numerous occasions (over a period of several months) that the fresh MOX fuel will not contain weapons usable material. This misinformation has gone uncorrected by the Government of Canada. 1

According to the 1997 DoE Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment, "environmental assessment of activities conducted in Canada would be the responsibility of the Canadian government" Repeated requests for such an assessment have gone unanswered by the Government of Canada.

There are also significant cost issues associated with the MOX plan in Canada. The four Bruce "A" reactors, which have been identified by AECL as the reactors which would eventually use MOX fuel are at present non-operational and their refurbishment will require a large capital investment. There has been no indication as to how repairs will be financed.

Concerns in Canada have grown over the MOX fuel plan and the and the Government of Canada's handling of the test burn issue.

/...2

MR017

MR017–1 **Parallex EA**

DOE acknowledges the commentor's concerns regarding the importation of U.S. weapons-usable plutonium into Canada for the purposes of a "test-burn" at Chalk River Laboratories. Shipments of a small quantity of MOX fuel from LANL to Canada are part of a separate proposed action, the Parallex Project; therefore, they are beyond the scope of the proposed action analyzed in this SPD EIS. DOE has prepared an *Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment* (DOE/EA-1216, January 1999) and FONSI, signed August 13, 1999, on fabrication of the MOX fuel and its transportation to Canada. This EA and FONSI can be viewed on the MD Web site at http://www.doe-md.com. As indicated in Section 1.1, while the United States is participating in the Parallex Project, it is not actively pursuing the CANDU option as part of its plutonium disposition program. If Russia and Canada agree to disposition Russian surplus plutonium in CANDU reactors in order to augment Russia's disposition capability, shipments of the Russian MOX fuel would take place directly between Russia and Canada.

DOE acknowledges the attachment of various documents concerning MOX fuel use in Canada.

CAMPAIGN FOR NUCLEAR PHASEOUT
KRISTEN OSTLING
PAGE 2 OF 3

- 2 -

In October 1996, a private seminar on the plan to use MOX fuel in Canadian civilian reactors was organized by a University of Toronto professor at the request of the Department of Foreign Affairs and others. The seminar included representatives from the Government of Canada who presented the case for MOX imports. It led to the production of a 1997 report and recommendation from Professor Franklyn Griffiths that the project be "consigned to oblivion" because it is "fundamentally flawed".

In December 1998, a Committee of the House of Commons (Standing Committee on Foreign Affairs and International Trade) consisting of members from all parties, including the governing party, recommended that the project be canceled on the grounds that "this option is totally unfeasible". The Government of Canada's subsequent rejection of this recommendation failed to address key issues put forward by intervenors at hearings held by the Committee.

In late March 1999, the Mayor of Sarnia, Ontario (a possible transit point for U.S. MOX shipments destined for Chalk River) expressed concern over the "veil of secrecy" around the project and lack of public consultation by the federal government.

In April 1999, the International Association of Firefighters called for a moratorium on plutonium fuel imports because of uncertainty as to whether their members would be able to handle an accident involving plutonium. Longshore workers at the port of Halifax (a possible entry point for Russian MOX fuel) also expressed concern about how the MOX shipments would be handled in Canada. 1

In May 1999, mayors of the Great Lakes and Saint Lawrence region passed a joint resolution calling on the governments of Canada and the United States to stop the weapons plutonium fuel plan.

A Presidential Executive Order requires the Department of Energy to implement the principles of environmental justice in its review process (Section 3.6 of the Parallex Environmental Assessment). The Parallex Environmental Assessment noted that the DoE was in the process of finalizing procedures for the implementation of the Executive Order.

In a September 17, 1997 letter to the DoE written in connection with the Parallex EA, CNP noted that while there is no stated requirement for a similar analysis of political impacts outside its borders, the United States has a moral obligation to consider the negative impacts of its actions on countries that it claims as allies. This should particularly be the case when the activities which follow from approval of the Parallex assessment will fundamentally change Canada's status with respect to nuclear weapons materials on its soil.

Despite the lack of formal public consultations, there is growing opposition to the MOX fuel importation plan in Canada. MOX fuel shipments to Canada should not go forward. Canadians have not been consulted on the fundamental policy question as to whether they want their country to become a recipient of weapons plutonium.

Thank you for your attention to this matter.

Sincerely,

Kristen Ostling
National Coordinator

encl.

MR017

List of enclosures

1. Newspaper clippings on the importation of MOX fuel into Canada

2. Allison Macfarlane & Adam Bernstein, "Canning plutonium: Cheaper and Faster", Bulletin of the Atomic Scientists, May-June 1999.

3. Excerpts from House on Commons, Parliament of Canada, Question Period dealing with the issue of MOX fuel imports.

4. Excerpt from Nova Scotia Legislature (Canada), April 7, 1999 regarding Russian MOX fuel to be shipped through Halifax Harbour.

5. Excerpt from *Canada and the Nuclear Challenge: Reducing the Political Value of Nuclear Weapons for the Twenty First Century*, Report if the Standing Committee on Foreign Affairs and International Trade, December 1998.

6. Franklyn Griffiths, "MOX Experience: The Disposition of Excess Russian and U.S. Weapons Plutonium in Canada", July 1997.

7. "Plutonium Shipments and Burning in the Great Lakes Region", Resolution passed at the International Great Lakes and St. Lawrence Mayors' Conference, May 21, 1999.

8. "Plutonium Shipments Risk Public Safety, Fire Fighters say", International Association of Fire Fighters, Media release, April 26, 1999.

9. "Background information on the weapons usability of MOX fuel: A comparison of claims made by AECL and other sources regarding the weapons usability of MOX fuel", produced by the Campaign for Nuclear Phaseout, June 1999

10. "Ten reasons to just say no to weapons plutonium fuel", produced by the Canadian Coalition for Nuclear Responsibility and the Campaign for Nuclear Phaseout, May 1999

11. "Pressure Intensifies on Government to Halt Plutonium Plan", Campaign for Nuclear Phaseout, Media Release, May 17, 1999.

12. "Environment Groups Slam Government for Pushing Plutonium Imports Under Guise of Disarmament", Campaign for Nuclear Phaseout, Media release, April 22, 1999.

MD017

ESDRC, UNIVERSITY OF NEW BRUNSWICK
JESSIE DAVIES
PAGE 1 OF 2

I strongly oppose the importation of MOX fuel into Canada. I support this with the following reasons. Yours truly,
Jessie Davies

1) The shipment of MOX fuel should not be approved without adequate consultation of the Canadian population; to date, there has been none.

2) According to the Pre-Decisional Environmental Assessment from Los Alamos (Sept '97), "environmental assessment of activities conducted in Canada would be the responsibility of the Canadian government"; repeated requests for such an assessment have been refused by the government.

3) The Government of Canada has not provided the public with any reliable documentation containing solid information or even a clear explanation of the issues surrounding this project. 1

4) Atomic Energy Canada Limited (the proponent) has frequently given out misinformation on the project; for example, AECL's designated spokesman Larry Shewchuk has stated on numerous occasions (over a period of seven months) that the fresh MOX fuel will not contain weapons usable material. This misinformation has gone uncorrected by the Canadian government.

5) In October 1996, a private two-day seminar was organized by Professor Franklyn Griffiths at the urging of AECL and the Government of Canada. It led to a recommendation from Professor Griffiths that the project be "consigned to oblivion" because it is "fundamentally flawed."

WR006

WR006–1 **Parallex EA**

DOE acknowledges the commentor's opposition to the importation of MOX fuel into Canada. Shipments of a small quantity of MOX fuel from LANL to Canada are part of a separate proposed action, the Parallex Project; therefore, they are beyond the scope of the proposed action analyzed in this SPD EIS. DOE has prepared an *Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment* (DOE/EA-1216, January 1999) and FONSI, signed August 13, 1999, on fabrication of the MOX fuel and its transportation to Canada. This EA and FONSI can be viewed on the MD Web site at http://www.doe-md.com.

6) In December 1998, an all party Committee of the House of Commons unanimously recommended that the project be cancelled; the Government of Canada rejected this recommendation without debate or discussion.

7) In April 1999, the International Association of Firefighters called for a moratorium on plutonium fuel imports because of uncertainty as to whether their members would be able to handle an accident involving plutonium. 1

8) A joint resolution was passed in May 1999 by mayors of the Great Lakes and Saint Lawrence region calling on the government of Canada and the United States to stop the weapons plutonium fuel plan.

9) All 4 Bruce "A" reactors (named by AECL as the reactors of choice to burn MOX eventually) are shut down and will require large investments of capital to repair – capital which the debt-ridden Ontario utility does not have at its disposal.

WR006

SIERRA CLUB OF CANADA
ELIZABETH MAY
PAGE 1 OF 11

Sierra Club of/du Canada

(Please Note: this letter and the materials which follow were faxed over several days without success to a number provided by the DoE in Washington, (202-488-3158))

June 25, 1999

U.S. Department of Energy
Office of Fissile Material Disposition
c/o Supplement to SPD EIS
P.O. Box 23786
Washington, DC 20026-3786

via fax: 202-596-2710 (11 pages)
cc. 202-488-4802 Att. Lynn Dean

To the Office of Fissile Material Disposition:

I am writing in connection with the Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement. We ask that the material included in this correspondence be made part of the Supplemental Pu Disposition EIS record. The Sierra Club of Canada is opposed to the planned test burn of American and Russian MOX fuel at Chalk River Laboratories in Canada. Our concerns, which include failure of the Government of Canada to consult the Canadian public and to undertake public assessment of environmental and social impacts have led us to conclude that shipments of MOX fuel to Canada should not proceed.

According to the 1997 Department of Energy Environmental Assessment for Parallex Project Fuel Manufacture and Shipment, "environmental assessment of activities conducted in Canada would be the responsibility of the Canadian government". As the attached correspondence indicates, the Sierra Club is in the process of attempting to determine whether the Government of Canada plans to undertake an environmental assessment and related measures. To date the government has failed to undertake such an assessment.

However, opposition to the MOX fuel project in Canada amongst those outside the nuclear industry who have examined the proposal is widespread. It includes the Committee of the House of Commons charged with reviewing Canada's nuclear weapons and non-proliferation policy (Standing Committee on Foreign Affairs and International Trade, SCFAIT). The Committee, consisting of members from all parties in the Canadian parliament, including the government party, recommended that the Canadian government not proceed with the plan to burn MOX fuel. The Government of Canada's subsequent rejection of this recommendation failed to address key issues underlying the Committee's conclusion. 1

An Executive Order of the President of the United States requires the Department of Energy to implement principles of environmental justice in its review process (Section 3.6 of the Parallex Environmental Assessment). While the United States does not have jurisdictional responsibility with respect to undertaking an environmental assessment in Canada, it does have an international obligation to consider whether principles of environmental justice are being consistently applied on its projects. I would suggest that this is particularly the case when the only formal review of the project to date in Canada (SCFAIT) recommended against continuance of the project's Canadian component.

Sincerely,

Elizabeth May
Executive Director

412-1 rue Nicholas St., Ottawa, Ontario K1N 7B7 Tél : (613) 241-4611 Fax / tc : (613) 241-2292 sierra@web.net

FR015

FR015–1 **Parallex EA**

DOE acknowledges the commentor's opposition to the test burn of U.S. and Russian MOX fuel at Chalk River Laboratories. Shipments of a small quantity of U.S. MOX fuel from LANL to Canada are part of a separate proposed action, the Parallex Project; therefore, they are beyond the scope of the proposed action analyzed in this SPD EIS. DOE has prepared an *Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment* (DOE/EA-1216, January 1999) and FONSI, signed August 13, 1999, on fabrication of the MOX fuel and its transportation to Canada. This EA and FONSI can be viewed on the MD Web site at http://www.doe-md.com.

DOE acknowledges the attachments with questions to various Canadian officials.

Sierra Club of/du Canada
412-1 rue Nicholas St., Ottawa, Ontario K1N 7B7
Tel : (613) 241-4611 Fax / tc : (613) 241-2292

Concerned Citizens of Renfrew County and Area
P.O. Box 981, Pembroke, Ontario K8A 7M5
Tel.: (613) 735-4876 Fax: (613) 735-6444

June 16, 1999

The Honourable Christine Stewart
Minister of the Environment
Terrasses de la Chaudière
10 Wellington Street, 28th floor
Hull, Quebec
K1A 0H3

COPY

Dear ~~Ms~~ Christine Stewart:

It has been reported that preparations are underway for the United States and Russia to transport MOX fuel (mixed oxide fuel from weapons usable plutonium) to Canada. The preparations arise out of work done in connection with the Parallex Project which involves the testing of MOX fuel in a nuclear reactor located at Chalk River Laboratories in Chalk River, Ontario.

Shipment of MOX fuel from the U.S. into Canada for the purposes of testing (a "test burn") at Chalk River Laboratories is reportedly imminent. It is understood that preparations are also underway to import MOX plutonium into Canada from Russia.

As you are aware, the importation of MOX fuel into Canada for use in Canadian reactors is a matter of considerable public interest. It is of particular interest to people in Canadian communities through which MOX fuel might be transported. Accordingly, we are seeking replies to the following questions:

1. The Minister of Transport stated in the House of Commons on April 26, 1999 that it is up to Transport Canada under the Transportation of Dangerous Goods Act to approve the transportation of plutonium fuel. Will Transport Canada or another agent of the Government of Canada issue (or have they issued) a permit in connection with the pending or current transport of MOX fuel into Canada?

2. How many shipments of MOX fuel from the United States into Canada will take place for the purposes of testing at Chalk River Laboratories?

3. How many shipments of MOX fuel from Russia into Canada will take place for the purposes of testing at Chalk River Laboratories?

4. Which port or ports of entry into Canada will MOX fuel be transported through? On what dates will MOX fuel be transported in Canada?

(continued)

FR015

SIERRA CLUB OF CANADA
ELIZABETH MAY
PAGE 3 OF 11

(continued from page 1)

5. Is any department or agency of the Government of Canada providing a subsidy, loan or other form of financial assistance to support the testing?

6. Have the shipping packages to be used as part of the Parallex tests (Model 4H Enriched Fuel Bundle Shipping Package, TNB-0145 Shipping Package or other) been subject to Canadian testing and environmental assessment in connection with the transport of MOX fuel into and through Canada?

7. Has a shipping certificate or other certificate been issued by Transport Canada or another agent of the Government of Canada in connection with the importation into Canada of MOX fuel, for the purposes of a test in a nuclear reactor at Chalk River Laboratories?

8. Has an emergency response plan been submitted in connection with the transport of MOX fuel in Canada?

9. Will an environmental assessment be undertaken in connection with activities related to the Parallex Project or any related ongoing project conducted within Canada, including the transportation of MOX fuel for the purposes of testing at Chalk River Laboratories? What measures are in place to ensure that the safety of Canadians and the environment of Canada are protected?

Your cooperation in ensuring that these questions are addressed in an open and publicly accountable fashion would be appreciated.

Sincerely,

Ole Hendrickson

Ole Hendrickson
Researcher
Concerned Citizens of Renfrew County and Area

COPY

Elizabeth May

Elizabeth May
Executive Director
Sierra Club of Canada

FR015

Sierra Club of/du Canada
412-1 rue Nicholas St., Ottawa, Ontario K1N 7B7
Tél : (613) 241-4611 Fax / tc : (613) 241-2292

Concerned Citizens of Renfrew County and Area
P.O. Box 981, Pembroke, Ontario K8A 7M5
Tel.: (613) 735-4876 Fax: (613) 735-6444

June 16, 1999

The Honourable Lloyd Axworthy
Minister of Foreign Affairs
Lester B. Pearson Building
A-10, 125 Sussex Drive
Ottawa, Ontario
K1A 0G2

COPY

Dear Mr. Axworthy:

It has been reported that preparations are underway for the United States and Russia to transport MOX fuel (mixed oxide fuel from weapons usable plutonium) to Canada. The preparations arise out of work done in connection with the Parallex Project which involves the testing of MOX fuel in a nuclear reactor located at Chalk River Laboratories in Chalk River, Ontario.

Shipment of MOX fuel from the U.S. into Canada for the purposes of testing (a "test burn") at Chalk River Laboratories is reportedly imminent. It is understood that preparations are also underway to import MOX plutonium into Canada from Russia.

As you are aware, the importation of MOX fuel into Canada for use in Canadian reactors is a matter of considerable public interest. It is of particular interest to people in Canadian communities through which MOX fuel might be transported. Accordingly, we are seeking replies to the following questions:

1. The Minister of Transport stated in the House of Commons on April 26, 1999 that it is up to Transport Canada under the Transportation of Dangerous Goods Act to approve the transportation of plutonium fuel. Will Transport Canada or another agent of the Government of Canada issue (or have they issued) a permit in connection with the pending or current transport of MOX fuel into Canada?

2. How many shipments of MOX fuel from the United States into Canada will take place for the purposes of testing at Chalk River Laboratories?

3. How many shipments of MOX fuel from Russia into Canada will take place for the purposes of testing at Chalk River Laboratories?

4. Which port or ports of entry into Canada will MOX fuel be transported through? On what dates will MOX fuel be transported in Canada?

(continued)

FR015

SIERRA CLUB OF CANADA
ELIZABETH MAY
PAGE 5 OF 11

(continued from page 1)

5. Is any department or agency of the Government of Canada providing a subsidy, loan or other form of financial assistance to support the testing?

6. Have the shipping packages to be used as part of the Parallex tests (Model 4H Enriched Fuel Bundle Shipping Package, TNB-0145 Shipping Package or other) been subject to Canadian testing and environmental assessment in connection with the transport of MOX fuel into and through Canada?

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9. Will an environmental assessment be undertaken in connection with activities related to the Parallex Project or any related ongoing project conducted within Canada, including the transportation of MOX fuel for the purposes of testing at Chalk River Laboratories? What measures are in place to ensure that the safety of Canadians and the environment of Canada are protected?

Your cooperation in ensuring that these questions are addressed in an open and publicly accountable fashion would be appreciated.

Sincerely,

Ole Hendrickson
Researcher
Concerned Citizens of Renfrew County and Area

COPY

Elizabeth May
Executive Director
Sierra Club of Canada

FR015

Sierra Club of/du Canada
412-1 rue Nicholas St., Ottawa, Ontario K1N 7B7
Tél.: (613) 241-4611 Fax / tc : (613) 241-2292

Concerned Citizens of Renfrew County and Area
P.O. Box 981, Pembroke, Ontario K8A 7M5
Tel.: (613) 735-4876 Fax: (613) 735-6444

June 16, 1999

Dr. Agnes Bishop
President
Atomic Energy Control Board
280 Slater Street, 4th floor
Ottawa, Ontario
K1A 0S4

COPY

Dear Dr. Bishop:

It has been reported that preparations are underway for the United States and Russia to transport MOX fuel (mixed oxide fuel from weapons usable plutonium) to Canada. The preparations arise out of work done in connection with the Parallex Project which involves the testing of MOX fuel in a nuclear reactor located at Chalk River Laboratories in Chalk River, Ontario.

Shipment of MOX fuel from the U.S. into Canada for the purposes of testing (a "test burn") at Chalk River Laboratories is reportedly imminent. It is understood that preparations are also underway to import MOX plutonium into Canada from Russia.

As you are aware, the importation of MOX fuel into Canada for use in Canadian reactors is a matter of considerable public interest. It is of particular interest to people in Canadian communities through which MOX fuel might be transported. Accordingly, we are seeking replies to the following questions:

1. The Minister of Transport stated in the House of Commons on April 26, 1999 that it is up to Transport Canada under the Transportation of Dangerous Goods Act to approve the transportation of plutonium fuel. Will Transport Canada or another agent of the Government of Canada issue (or have they issued) a permit in connection with the pending or current transport of MOX fuel into Canada?

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(continued)

FR015

(continued from page 1)

5. Is any department or agency of the Government of Canada providing a subsidy, loan or other form of financial assistance to support the testing?

6. Have the shipping packages to be used as part of the Parallex tests (Model 4H Enriched Fuel Bundle Shipping Package, TNB-0145 Shipping Package or other) been subject to Canadian testing and environmental assessment in connection with the transport of MOX fuel into and through Canada?

7. Has a shipping certificate or other certificate been issued by Transport Canada or another agent of the Government of Canada in connection with the importation into Canada of MOX fuel, for the purposes of a test in a nuclear reactor at Chalk River Laboratories?

8. Has an emergency response plan been submitted in connection with the transport of MOX fuel in Canada?

9. Will an environmental assessment be undertaken in connection with activities related to the Parallex Project or any related ongoing project conducted within Canada, including the transportation of MOX fuel for the purposes of testing at Chalk River Laboratories? What measures are in place to ensure that the safety of Canadians and the environment of Canada are protected?

Your cooperation in ensuring that these questions are addressed in an open and publicly accountable fashion would be appreciated.

Sincerely,

Ole Hendrickson

Ole Hendrickson
Researcher
Concerned Citizens of Renfrew County and Area

COPY

Elizabeth May

Elizabeth May
Executive Director
Sierra Club of Canada

FR015

Sierra Club of/du Canada
412-1 rue Nicholas St., Ottawa, Ontario K1N 7B7
Tel : (613) 241-4611 Fax / tc : (613) 241-2292

Concerned Citizens of Renfrew County and Area
P.O. Box 981, Pembroke, Ontario K8A 7M5
Tel.: (613) 735-4876 Fax: (613) 735-6444

June 16, 1999

COPY

The Honourable David Collenette
Minister of Transport
Place de Ville, Tower C
29th floor, 330 Sparks Street
Ottawa, Ontario
K1A 0N5

Dear Mr. Collenette:

It has been reported that preparations are underway for the United States and Russia to transport MOX fuel (mixed oxide fuel from weapons usable plutonium) to Canada. The preparations arise out of work done in connection with the Parallex Project which involves the testing of MOX fuel in a nuclear reactor located at Chalk River Laboratories in Chalk River, Ontario.

Shipment of MOX fuel from the U.S. into Canada for the purposes of testing (a "test burn") at Chalk River Laboratories is reportedly imminent. It is understood that preparations are also underway to import MOX plutonium into Canada from Russia.

As you are aware, the importation of MOX fuel into Canada for use in Canadian reactors is a matter of considerable public interest. It is of particular interest to people in Canadian communities through which MOX fuel might be transported. Accordingly, we are seeking replies to the following questions:

1. The Minister of Transport stated in the House of Commons on April 26, 1999 that it is up to Transport Canada under the Transportation of Dangerous Goods Act to approve the transportation of plutonium fuel. Will Transport Canada or another agent of the Government of Canada issue (or have they issued) a permit in connection with the pending or current transport of MOX fuel into Canada?

2. How many shipments of MOX fuel from the United States into Canada will take place for the purposes of testing at Chalk River Laboratories?

3. How many shipments of MOX fuel from Russia into Canada will take place for the purposes of testing at Chalk River Laboratories?

4. Which port or ports of entry into Canada will MOX fuel be transported through? On what dates will MOX fuel be transported in Canada?

(continued)

FR015

(continued from page 1)

5. Is any department or agency of the Government of Canada providing a subsidy, loan or other form of financial assistance to support the testing?

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Sincerely,

Ole Hendrickson

Ole Hendrickson
Researcher
Concerned Citizens of Renfrew County and Area

Elizabeth May

Elizabeth May
Executive Director
Sierra Club of Canada

COP

FR015

Sierra Club of/du Canada
412-1 rue Nicholas St., Ottawa, Ontario K1N 7B7
Tél : (613) 241-4611 Fax / tc : (613) 241-2292

Concerned Citizens of Renfrew County and Area
P.O. Box 981, Pembroke, Ontario K8A 7M5
Tel.: (613) 735-4876 Fax: (613) 735-6444

COPY

June 16, 1999

The Honourable Ralph Goodale
Minister of Natural Resources
Sir William Logan Building
21st Floor, 580 Booth Street
Ottawa, Ontario
K1A 0E4

Dear Mr. Goodale:

It has been reported that preparations are underway for the United States and Russia to transport MOX fuel (mixed oxide fuel from weapons usable plutonium) to Canada. The preparations arise out of work done in connection with the Parallex Project which involves the testing of MOX fuel in a nuclear reactor located at Chalk River Laboratories in Chalk River, Ontario.

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4. Which port or ports of entry into Canada will MOX fuel be transported through? On what dates will MOX fuel be transported in Canada?

(continued)

FR015

SIERRA CLUB OF CANADA
ELIZABETH MAY
PAGE 11 OF 11

(continued from page 1)

5. Is any department or agency of the Government of Canada providing a subsidy, loan or other form of financial assistance to support the testing?

6. Have the shipping packages to be used as part of the Parallex tests (Model 4H Enriched Fuel Bundle Shipping Package, TNB-0145 Shipping Package or other) been subject to Canadian testing and environmental assessment in connection with the transport of MOX fuel into and through Canada?

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Your cooperation in ensuring that these questions are addressed in an open and publicly accountable fashion would be appreciated.

Sincerely,

Ole Hendrickson
Researcher
Concerned Citizens of Renfrew County and Area

COPY

Elizabeth May
Executive Director
Sierra Club of Canada

FR015

spec Society Promoting Environmental Conservation
2150 Maple St., Vancouver, BC V6J 3T3
Phone: (604) 736-7732; Fax: (604) 736-7115
E-Mail: enviro@spec.bc.ca

SINCE 1969 ENVIRONMENTAL ADVOCACY, EDUCATION, AND CONSERVATION

June 26, 1999

U.S. Department of Energy
Office of Fissile Material Disposition
P.O. Box 23786
Washington, DC 20026-3786

VIA FAX: (202)488-3158

Dear Sir/Madame,

Re: **"Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement"**

The Society Promoting Environmental Conservation requests that you not approve MOX fuel shipments to Canada. Canadians don't want it and have made the reasons crystal clear to our Government.

In fact an all-party House of Commons Committee that studied this issue recommended unanimously on Dec. 10 1998 that the project was "totally unfeasible." It is unfortunate that our government simply overruled that recommendation without debate, and plans to proceed regardless. The disastrous economic and safety record of the CANDU reactors in which they intend to 'burn' this fuel is further cause for concern.

Environmental assessment of these activities in Canada (as required by the Pre-Decisional Environmental Assessment from Los Alamos, in September, 1997) has not been done, nor has the Canadian government provided reliable information to the public or even explained the issues. On the contrary, government agencies such as AECL have deliberately disseminated misinformation - such as that fresh MOX fuel will not contain weapons usable material. The International Association of Firefighters doubt their ability to handle an accident involving plutonium MOX, and have called for a moratorium. Municipal governments have likewise asked that the project be scrapped. We agree. 1

Attached is a news release on this issue published in 1998 in Vancouver, by a number of local, national and international groups.

Sincerely,

Norman Abbey

Norman Abbey
SPEC - Nuclear issues

Enclosed: News Release - "Keep Plutonium Out of Canada" (March 13, 1998)

FR010

FR010–1 **Parallex EA**

DOE acknowledges the commentor's opposition to MOX fuel shipments to Canada. Shipments of a small quantity of MOX fuel from LANL to Canada are part of a separate proposed action, the Parallex Project; therefore, they are beyond the scope of the proposed action analyzed in this SPD EIS. DOE has prepared an *Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment* (DOE/EA-1216, January 1999) and FONSI, signed August 13, 1999, on fabrication of the MOX fuel and its transportation to Canada. This EA and FONSI can be viewed on the MD Web site at http://www.doe-md.com.

DOE acknowledges the attachment of a news release expressing opposition to importing MOX fuel.

Nanoose Conversion Campaign

2150 Maple Street, Vancouver, BC, Canada, V6J 3T3 (604)739-0432 Tel/Fax e-mail: convert@alternatives.com

For release March 13, 1998

KEEP PLUTONIUM OUT OF CANADA

VANCOUVER - "Don't bring nuclear weapons plutonium into Canada!" say BC groups participating in the launch of a global NIX-MOX campaign. They want to stop Ottawa from importing plutonium mixed oxide (MOX) as an experimental fuel for Ontario Hydro's accident plagued Candu reactors. Plutonium is a nuclear bomb ingredient, and one of the most dangerous carcinogens on the planet.

The Women's International League for Peace and Freedom (WILPF-BC), the Nanoose Conversion Campaign (NCC), Veterans Against Nuclear Arms (VANA), and the Canadian Voice of Women for Peace (VOW-BC) will sponsor a plutonium "information vigil" at noon on Mon., Mar. 16 at Robson Square in downtown Vancouver.

Simultaneous news conferences are planned in Ottawa and around the world. Candu reactor exports to Turkey are also being opposed at a seperate Mar. 16 news conference in Istanbul.

Prime Minister Jean Chretien intends to begin importing MOX this spring from nuclear weapons labs in Los Alamos, New Mexico. Parliament, however, has yet to debate the matter.

"If it enters Canada, it will never leave", says NCC director Norman Abbey. "Thousands of years from now Canadians may wonder why Chretien couldn't have simply waited a few weeks: until the all-party committee reviewing nuclear policy (including MOX) had completed its report. Pre-empting the process and avoiding debate casts real doubt on the sincerity of this government's very laudable invitation for Canadians to 'comment' on nuclear issues." 1

The Vancouver vigil organizers advocate proven safe-energy alternatives that don't contribute to nuclear proliferation, and they will distribute a "Nuclear Map of Canada" documenting Canada's extensive participation in the nuclear fuel chain - from Ontario's Chalk River Labs to the Nanoose Bay test range for nuclear submarines in BC.

WILPF, with SECTIONS in 45 countries, was founded at the Hague in 1915. VANA was founded in 1982 during the most dangerous years of the cold war, and the Nanoose Conversion Campaign was formed in 1984 to convert the nuclear submarine facility at Nanoose Bay to peaceful uses.

\- 30 -

More information:

NCC: Norman Abbey, 604-351-1416
WILPF-BC: Silvia McFadyen-Jones, 604-536-3047 or Carolyn Kline, 604-731-4585
VANA: David Morgan, 604-985-7147
Campaign for Nuclear Phaseout: Kristen Ostling, 613-789-3634
Nuclear Map of Canada: http://ccnr.org/atomic map

FR010

Hello this is Dr. Kathleen Sullivan phoning from the Center for Human Ecology in Edinburgh, Scotland. I am calling to lodge my complaint against the U.S. DOE's present disposition plans for plutonium. The use of weapons grade plutonium in commercial nuclear reactors, otherwise known as MOX fuel, will involve all of the risks inherent to the nuclear industry, transportation risks, contamination risks, social risks that would cause certain affected communities, impoverished and ethnic communities, to be feeling more of a punch than the white privileged communities of America. 1
We understand here that the DOE has recently signed a contract with COGEMA and Duke Engineering & Services and Stone & Webster and they are now doing an analysis of producing MOX fuel which is presently, as I understand it, going through an ESI, EIS that is, and that in this proposal they would advocate preparing plutonium for MOX in South Carolina, North Carolina and Virginia. I also understand that the DOE has never held a hearing near any of the potential reactor sites which would use MOX fuel. 2
I would like to state my absolute condemnation against the program of MOX which would continue to advocate a plutonium economy in a world that is already saturated with fissile materials. The production of MOX is a crazy idea and it is no solution at all. 3
Again this is Dr. Kathleen Sullivan phoning from the Center for Human Ecology in Edinburgh. Although I am living in the U.K., I am a U.S. citizen and my U.S. home in Boulder, Colorado, close to Rocky Flats which will be affected by any MOX fuel plan for the U.S. I can be reached at 44-131-624-1975. My address is Center for Human Ecology, P.O. Box 1972, Edinburgh, EH 12QL, Scotland. Thank you very much.

PR003

PR003–1 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Chapter 4 of Volume I provide the results of detailed impact analyses of the proposed surplus plutonium disposition facilities and reactors. Risks and consequences are addressed. The impacts on workers and the general population associated with normal operations and postulated accidents are included in these analyses. Included are the potential impacts on waste management, socioeconomics, and transportation. Chapter 4 also includes an analysis of the potential impacts on minority and low-income populations for each of the alternatives considered. Appendix M describes the process that was used to obtain these impacts and gives additional detail on the minority and low-income populations surrounding each of the candidate sites.

PR003–2 **General SPD EIS and NEPA Process**

In March 1999, DOE awarded a contract to a team known as DCS, which is comprised of Duke Engineering & Services, COGEMA Inc., and Stone & Webster to provide MOX fuel fabrication and irradiation services.

DOE acknowledges the commentor's concern regarding public hearings near the proposed reactor sites that would use the MOX fuel. During the public comment period on the *Supplement to the SPD Draft EIS*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. Although DOE decided not to hold additional hearings on the *Supplement*, DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis,

CENTER FOR HUMAN ECOLOGY
KATHLEEN SULLIVAN
PAGE 2 OF 2

DOE attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina. Moreover, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process should the MOX approach be pursued per the SPD EIS ROD.

PR003–3 **DOE Policy**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to advocate a plutonium economy. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel) and therefore does not support building a plutonium economy.

EAST BAY PEACE ACTION
DALE NESBITT ET AL.
PAGE 1 OF 2

To: Mary Olson, NIRS
From; Dale Nesbitt, and associates from the S. F. Bay area
Statement of be presented on our behalf at the 6-15-99 DOE hearings on MOX fuels.

We the undersigned representing either organizations or ourselves hereby submit the following comments for the June 15, 1999 MOX hearings in Washington D C.

First we believe that holding only one hearing in Washington D C fundamentally violates the public's right to express its views on this vital issue. We demand that the DOE hold several additional hearings, near communities that may be effected. In addition, at least hearing should be held on the west coast. We suggest Oakland CA as a logical location. 1

Second, we believe that the U.S.-Russian governmental plan to use MOX fuel from surplus military plutonium in commercial nuclear reactors will prove disastrous. The MOX program poses unreasonable risks to public health and the environment, and seriously undermines U.S. nonproliferation goals. While less important than the above it also appears to be uneconomical. 2

Third, we understand that although the EIS process is not yet complete, a consortium including Cogema, Stone & Webster, Duke Power and Virginia Power has already been selected by the DOE to carry out the U.S. MOX program and was recently given a contract to begin design work on a MOX fabrication plant. We feel that this demonstrates a contemptible disregard for due process and also is questionable from a legal standpoint. 3

Signed by;
Dale Nesbitt & Elizebeth Brown for East Bay Peace Action, and as individuals.
Jacqueline Cabasso, Executive Director, Western States Legal Foundation, for the the organization & as an individual
Gene Bernardi, for the Committee to minimize Toxic Waste, and as an individual.
The following as individuals:
Frank McDonald
L. A. Wood
Gordon Wright
Nori Neiude

DCR011

DCR011–1 **General SPD EIS and NEPA Process**

DOE acknowledges the commentors' request for additional hearings near communities that may be affected by the use of MOX fuel in reactors. After careful consideration of its public involvement opportunities, including information availability and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process should the MOX approach be pursued per the SPD EIS ROD. Moreover, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be selected. DOE does not believe that a hearing in Oakland, California is necessary in part because all three of the proposed reactors are located in the Eastern United States. Public hearings on this SPD EIS have been held in the Western United States in or near many of the potentially affected communities including hearings in Idaho, Washington, and Oregon.

DCR011–2 **MOX Approach**

DOE acknowledges the commentors' opposition to the MOX approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity

EAST BAY PEACE ACTION
DALE NESBITT ET AL.
PAGE 2 OF 2

for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

Section 4.28 provides reactor-specific analyses and discusses the potential environmental impacts and risks associated with using a partial MOX core during routine operations and reactor accidents at the proposed reactors.

The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

The MOX approach is not intended to affect the viability of nuclear power generation at any particular reactor. DCS would not have to continue to use MOX fuel if it determined that it was uneconomical to operate the reactor.

DCR011–3 **General SPD EIS and NEPA Process**

DOE conducted its procurement process in accordance with DOE NEPA regulations, 10 CFR 1021.216. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. As stipulated in DOE's phased contract with DCS, until and depending on the decisions regarding facility siting and approach to surplus plutonium disposition are decided and announced in the SPD EIS ROD, no substantive design work or construction can be started by DCS on the MOX facility. Should DOE decide to pursue the No Action Alternative or the immobilization-only approach, the contract with DCS would end. The contract is phased so that only nonsite-specific base contract studies and plans can be completed before the ROD is issued, and options that would allow construction and other work would be exercised by DOE if, and only if, the decision is made to pursue the MOX approach.

ROCKY MOUNTAIN CONFERENCE, UNITED CHURCH OF CHRIST
ROBERT A. KINSEY
PAGE 1 OF 1

MOX fuel is a bad idea. It further extends the Nuclear Power industry which has no intelligent idea – nor does anyone, including the DOE – about responsible ways for dealing with the increased nuclear waste. I mean using it to make depleted uranium ordinance is about as irresponsible as you can get and yet you allow that. Using it to power space craft that could crash into the atmosphere is another example of irresponsibility. So employing weapons grade Plutonium to make electricity is encouraging the production of more waste. All you seem to be able to think about is underground storage and have ignored for years the suggestion of nuclear guardianship as a way of warning future generations that we really don't know what to do with waste. Comments made at "Stakeholder hearings" are regularly discounted by your establishment and often don't even make it into print in the volumes you create out of our forests. When is the DOE going to stop being a tool of the nuclear power and nuclear weapons 1

WR003

WR003–1 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry or produce electricity. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. Use of nuclear materials to make depleted uranium ordinance or for use in spacecraft is beyond the scope of this EIS.

DOE acknowledges the commentor's preference for nuclear guardianship. This EIS includes the No Action Alternative, whereby the surplus plutonium would remain in storage at their current DOE locations. However, this alternative does not reduce the nonproliferation concerns associated with surplus plutonium.

Comments made at "stakeholder hearings" are carefully considered by DOE. Generally, at the hearings notetakers capture the main points of issues or concerns raised by the commentors; therefore, comments are not a verbatim transcript of the hearings. DOE's notetakers make every effort to ensure the essence of each participant's comment(s) has been presented in a clear, concise, and accurate manner. In addition to oral comments received at the public hearings held for the SPD Draft EIS and the *Supplement to the SPD Draft EIS*, written comments were also accepted at the hearings or could have been submitted via fax, mail, or Web site. Equal consideration was given to all comments, regardless of how or where they were received. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS
"Helping Floridians create safe, vibrant, sustainable communities"

JEB BUSH
Governor

STEVEN M. SEIBERT
Secretary

May 24, 1999

Mr. Howard R. Canter
U.S. Department of Energy
Office of Fissile Materials Disposition
Post Office Box 23786
Washington, D.C. 20026-3786

RE: Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement (DEIS - SAI # FL9808110565C)

Dear Mr. Canter:

The Florida State Clearinghouse has received the Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement dated April 1999. Based on the changes in this document, our previous determination remains in effect (enclosed).

Upon completion of the Final Environmental Impact Statement, please forward to the Florida State Clearinghouse at the address below. 1

Thank you for the opportunity to comment on this document. If you have any questions regarding this letter, please contact Ms. Cherie Trainor, Clearinghouse Coordinator, at (850) 922-5438.

Sincerely,

Chris McCay

for Ralph Cantral, Executive Director
Florida Coastal Management Program

RC/ct

Enclosure

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100
Phone: (850) 488-8466/Suncom 278-8466 FAX: (850) 921-0781/Suncom 291-0781
Internet address: http://www.dca.state.fl.us

FLORIDA KEYS
Area of Critical State Concern Field Office
2796 Overseas Highway, Suite 212
Marathon, Florida 33050-2227

GREEN SWAMP
Area of Critical State Concern Field Office
205 East Main Street, Suite 104
Bartow, Florida 33830-4641

MR007

MR007–1 **General SPD EIS and NEPA Process**

DOE acknowledges the State's receipt of the *Supplement to the SPD Draft EIS* and its determination that the proposed action is consistent with the Florida Coastal Management Program. As requested, a copy of the SPD Final EIS was sent.

FLORIDA COASTAL MANAGEMENT PROGRAM
CHRIS MCCAY
PAGE 2 OF 9

STATE OF FLORIDA
DEPARTMENT OF COMMUNITY AFFAIRS
"Helping Floridians create safe, vibrant, sustainable communities"

LAWTON CHILES
Governor

JAMES F. MURLEY
Secretary

September 29, 1998

Mr. Howard R. Canter
U.S. Department of Energy
Office of Fissile Materials Disposition
Post Office Box 23786
Washington, DC 20026-3786

RE: U.S. Department of Energy - Surplus Plutonium Disposition - Draft Environmental Impact Statement - Statewide
SAI: FL9808110565C

Dear Mr. Canter:

The Florida State Clearinghouse, pursuant to Presidential Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated a review of the above-referenced project.

Based on the information contained in the draft environmental impact statement and the enclosed comments provided by our reviewing agencies, the state has determined that, at this stage, the above-referenced action is consistent with the Florida Coastal Management Program. 1

Thank you for the opportunity to review the draft environmental impact statement. If you have any questions regarding this letter, please contact Ms. Cherie Trainor, Clearinghouse Coordinator, at (850) 922-5438.

Sincerely,

Chris McCay
for Ralph Cantral, Executive Director
Florida Coastal Management Program

RC/cc

Enclosures

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100
Phone: 850.488.8466/Suncom 278.8466 FAX: 850.921.0781/Suncom 291.0781
Internet address: http://www.state.fl.us/comaff/dca.html

FLORIDA KEYS
Area of Critical State Concern Field Office
2796 Overseas Highway, Suite 212
Marathon, Florida 33050-2227

GREEN SWAMP
Area of Critical State Concern Field Office
155 East Summerlin
Bartow, Florida 33830-4641

SOUTH FLORIDA RECOVERY OFFICE
P.O. Box 4022
8600 N.W. 36th Street
Miami, Florida 33159-4022

MR007

Message:

COMMENTS DUE-2 WKS: 08/28/1998
CLEARANCE DUE DATE: 09/25/1998
SAI#: FL98081105

STATE AGENCIES	WATER MANAGEMENT DISTRICTS	OPB POLICY UNITS
X Agriculture Community Affairs Environmental Protection Game and Fresh Water Fish Comm OTTED State Transportation		Environmental Policy/C & ED

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evalutation and is categorized as one of the following:

___ Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.

_X_ Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.

___ Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.

___ Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

Department of Energy - Surplus Plutonium Disposition Draft Environmental Impact Statement - Florida.

To: Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850) 922-5438 (SC 292-5438)
(850) 414-0479 (FAX)

EO. 12372/NEPA

- [x] No Comment
- [ ] Comments Attached
- [ ] Not Applicable

Federal Consistency

- [x] No Comment/Consistent
- [ ] Consistent/Comments Attached
- [ ] Inconsistent/Comments Attached
- [ ] Not Applicable

From:
Division/Bureau: Florida Division of Forestry, Forest Resource Planning & Support Services Bureau, 3125 Conner Boulevard, Tallahassee, Florida 32399-1650
Reviewer: James Eric Ford
Date: 9/8/98

MR007

FLORIDA COASTAL MANAGEMENT PROGRAM
CHRIS MCCAY
PAGE 4 OF 9

CLEARANCE DUE DATE: 09/25/1998
SAI#: FL980811056

Message:

STATE AGENCIES	WATER MANAGEMENT DISTRICTS	OPB POLICY UNITS
Agriculture Community Affairs Environmental Protection Game and Fresh Water Fish Comm OTTED State Transportation		X Environmental Policy/C & ED

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The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evalutation and is categorized as one of the following:

- ___ Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.
- _X_ Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.
- ___ Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.
- ___ Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.

Project Description:

Department of Energy - Surplus Plutonium Disposition Draft Environmental Impact Statement - Florida.

To: Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850) 922-5438 (SC 292-5438)
(850) 414-0479 (FAX)

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- ☐ Inconsistent/Comments Attached
- ☐ Not Applicable

From:
Division/Bureau: EOG/OPB ENV
Reviewer: Paula L Allen
Date: ~~September~~ August 31, 1998

MR007

Message:

COMMENTS DUE-3 WKS: 09/04/1998
CLEARANCE DUE DATE: 09/25/1998
SAI#: FL98081105(

STATE AGENCIES	WATER MANAGEMENT DISTRICTS	OPB POLICY UNITS
Agriculture Community Affairs X Environmental Protection Game and Fresh Water Fish Comm OTTED State Transportation	RECEIVED SEP 23 1998 State of Florida Clearinghouse	Environmental Policy/C & ED

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From: FDEP
Division/Bureau: Ecosystem MGT/OIP
Reviewer: [signature]
Date: 9/21/98

MR007

To: Department of Energy
June 28, 1999

From: Patricia McCracken
413 Scotts Way
Augusta, Georgia 30909
706-7389451
by fax to 202-586-4078

Re: Spent Fuel (MOX)

To date no one at any public meetings or at the library sources can show a comprehensive transportation alternative study regarding any of the programs. People just talk about transportation but no documents seem to exist. One would want to know more about the design and structure of the DOE truck that is displayed at various meetings. What alternative modes of transportation exist in the nuclear world? 1

I attended a meeting on June 24, 1999 at the Gressette Building State House Complex, Columbia, South Carolina hosted by Senator Phil Leventis. I called the Office NEPA Compliance and Outreach for a handout of the program and nothing existed in Washington or at the meeting. After the meeting, I was still not sure what we were commenting about. 2 Questions were difficult for the representative from Cogema, as we needed an interpreter. Will the Cogema representatives who build the MOX building speak English?

I was unable to get some clarification from the DOE representatives from Washington because of the bully police type persons at the meeting, with no badges, who indicated no one could approach the group. However, other persons with some hearing devices and no badges or identification escorted around certain members of the audience. What are those gadgets in their ears and whom were they communicating with at the meeting. I did get to ask Mr. Stevenson to explain what the representative from Cogema said about his military connections and France's plutonium depletion policies. Mr. Stevenson was rushed and I did not really understand the answer. 3

Please indicate how we can get answers from the man from Cogema? I am particularly interested in the energy consumption comparison numbers for various alternative DOE projects including the MOX plant. No one on the panel 4

FR014

FR014–1 **Transportation**

In order to address security against terrorist-related incidents, all intersite shipments of plutonium for the surplus plutonium disposition program would be made using DOE's SST/SGT system as described in Appendix L.3.2. This involves having couriers that are armed Federal officers, an armored tractor to protect the crew from attack, and specially designed escort vehicles containing advanced communications equipment and additional couriers. While DOE prefers to minimize the transportation of plutonium that is still desirable for weapons use, plutonium is routinely and safely transported in the United States. As described in Appendix L.3.3, transportation of nuclear materials would be performed in accordance with all applicable DOT and NRC transportation requirements. Interstate highways would be used, and population centers avoided, to the extent possible.

Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

Alternative modes of transportation exist in the commercial nuclear world and consist of specially designed trucks and rail cars. However, the universal requirement for the transportation of most nuclear materials is the NRC-licensed shipping cask. NRC requires that shipping casks be able to survive a sequential series of tests that are intended to represent severe accident stresses. The tests are a 30-foot drop onto an unyielding flat surface, a shorter drop onto a vertical steel bar, engulfment by fire for 30 minutes, and, finally, immersion in 50 feet of water.

FR014–2 **General SPD EIS and NEPA Process**

DOE regrets the difficulty encountered in obtaining information on the meeting hosted by Senator Leventis. This meeting was not arranged by DOE but at the invitation of Senator Leventis. DOE attended and answered questions regarding the surplus plutonium disposition program. Additional information on the program can be found on the MD Web site at http://www.doe-md.com or by calling (202) 586-5368.

The MOX facility would be built at one of four candidate DOE sites in the United States by DCS should the decision be made in the SPD EIS ROD to pursue the MOX approach. Personnel involved in planning, constructing, managing and working at the MOX facility would communicate in English.

FR014–3 **General SPD EIS and NEPA Process**

The meeting in Columbia, South Carolina was sponsored and coordinated by Senator Leventis' office. The senator's office was responsible for the meeting logistics, including the security arrangements. Mr. Stevenson tried to explain that there is no connection between COGEMA and the French military.

FR014–4 **Infrastructure**

Questions for COGEMA should be directed to Ms. Christi A. Byerly. Her address is: 7401 Wisconsin Avenue; Bethesda, MD 20814. She may also be contacted by telephone at (301) 941-8367. Her fax number is (301) 652-5690, and her email address is cbyerly@cogema-inc.com.

could answer the question nor did they have any reference materials at the meeting. The representative from Cogema did spell the name of the French oil company Total that owns 20% of Cogema, 80% being the French government. 4

Does the MOX process require oil?

The first and only time I saw Mr. Nulton, he was telling an audience about how we needed British Nuclear Fuel Limited to help our country with nuclear management(MOX). Now I see Mr. Nulton again with the French company Cogema. Their new contract apparently includes constructing the MOX plant at SRS. Who else do we need to help us with a process that we developed in 1969. The DOE has many experiences with blending of nuclear materials. Out of approximately 160,000 nuclear persons twelve people decided that we needed another MOX group to help us build a building. Did we buy and import a process or a building design plan from Cogema? Did the contract reviewers know the US process from 1969. BNFL has built a plant and DOE has visited and hired BNFL. Did the twelve people who selected Cogema know that BNFL is already at SRS? 5

According to DOE/MC-0006 page 8, "In 1969, reactors at Big Rock Point ran for about a year using MOX fuel. They had no problems. This is not an experimental technology. It is 25 years old."

If we have so much extra plutonium then why have some commentaries stated that we have been buying plutonium from other countries? The comments give some broad terms for plutonium. Plutonium I am sure has various properties. 6

Why isn't the French military depleting their plutonium? The military apparently does not use Cogema to reprocess their weapons grade plutonium. 7

While the bully DOE police keep the public from asking questions at public meetings, who is policing and guarding our environmental technologies being developed at the facilities? Apparently all contractors have the ability to patent anything they develop with government money and sell the technology. Maybe the bully police should be guarding something besides the public meetings. According to the GAO/RCED-94-172 report nuclear technologies are needed throughout the world. Many opinions exist in this report. 8

FR014

FR014–5 **MOX Approach**

The MOX process does not use oil.

Duke Engineering & Services, COGEMA Inc., and Stone & Webster formed a team, DCS, to respond to DOE's *Request for Proposals for MOX Fuel Fabrication and Reactor Irradiation Services* (May 1998). Through this competitive procurement process, DOE awarded the contract to DCS to construct and operate the MOX facility on the basis that their proposal was determined to be the most responsive, best value offer submitted.

The commentor is correct that MOX fuel fabrication technology is not new. A small amount of MOX fuel was fabricated and tested in the United States in the late 1960s and early 1970s. DOE is not "importing" the MOX technology. However, COGEMA is one of only a few companies with recent commercial MOX fuel fabrication experience, and this experience will contribute to the success of DOE's MOX fuel fabrication effort. BNFL's contract for work at SRS is completely separate and different from its MOX fuel fabrication efforts in the United Kingdom. The team that selected DCS to build and operate the MOX facility, should the MOX approach be chosen in the SPD EIS ROD, was aware of BNFL's role at SRS.

DOE is not sharing information about U.S. weapons with COGEMA. The plutonium will have been removed from the pits and converted to an unclassified plutonium dioxide before it is transferred to the MOX facility.

Awarding the contract to DCS does not make the United States dependent on foreign entities. DCS is a U.S.-based company and the majority of the companies that comprise DCS are American.

FR014–6 **Other**

DOE is unaware of the source of the commentor's information that the United States is buying plutonium from other countries. The United States is not buying plutonium from other countries. If the United States were to buy any, it would only be done to keep the material from ending up in the hands of terrorists or rogue nations seeking nuclear weapons technology.

FR014–7 **Other**

This SPD EIS addresses the disposition of approximately 50 t (55 tons) of plutonium that President Clinton has declared surplus to national security needs. Russia also agreed to remove the same amount from its stockpile during a Moscow summit held in September 1998. (See Appendix A of Volume II). Plutonium belonging to France is not within the scope of this SPD EIS.

FR014–8 **DOE Policy**

DOE's policy is to transfer technology that has been developed at its laboratories and other facilities to the private sector if these technologies are thought to benefit society. DOE encourages, supports, and enables the transfer of unclassified technologies that have applications outside the DOE programs to the private sector and in return receives royalties or other forms of payment for the rights to use Government-developed technologies.

Is this a 5% process of plutonium and what is the
percentage that Cogema uses in France? 9

Historically the disposal process was developed for
domestic waste and somehow this concept has broadened 10
beyond the original scope of the legislation.

We stated at the meeting that we were grateful that Duke
Power is participating and we wonder where the rest of the
nuclear community is during this process. They have been
given a lot of help and we are developing a disposal 11
facility and working on other nuclear technologies that
could help the industry and they don't even offer an
advisory board or anything. Just where are they and why are
they not accountable for participation? The DOE comment
books do not even say who says the comments. Who at GAO
made those trips around the world to see the plants? Why 12
don't they comment during this process? How can we ask
them questions?

The GAO report states something like this under the British
Waste Program heading on page 57: "The utility plans to
construct a dry storage facility to hold spent fuel for up
to 100 years. Some environmental groups in the United
Kingdom consider aboveground storage to be the "least-
worst" option for managing high-level waste. They believe
that additional study of various disposal options is needed
before a method is selected." Who are these environmental 13
groups and who are their spokespersons? We hear that the
United States is already dependent on buying electricity
from nuclear plants in Canada. We apparently are importing
technology and importing energy from other countries. Why
isn't this discussed at the public meetings?

The notice we received to attend a workshop on the
technical documents was not conducted. 14

Page 41 of the GAO/RCED-94-172 states that because the
Japanese plan to store their waste for 30 to 50 years
before disposal, officials said they sense no immediate
urgency to dispose of the waste. The report further states 15
that the Japanese have not yet developed safety standards
for disposing of high-level waste. So maybe somebody might
sell them some technology! Other countries like Russia
were mentioned as needing technology. Sweden uses ships
for transporting. So where is our transportation plan, 1
explaining all the modes used throughout the world?

FR014

FR014–9 **MOX Approach**

Reactor MOX fuel in Europe is fabricated to similar enrichment levels (about 5 percent plutonium 239) to the levels being proposed for the U.S. reactors that would be used to irradiate MOX fuel.

FR014–10 **DOE Policy**

DOE believes the commentor is referring to disposal of spent fuel in a potential geologic repository. Irradiated MOX fuel would be spent fuel and would be managed as such by the licensee for the reactor in which the fuel was irradiated, and so would not be beyond the scope of the legislation.

FR014–11 **MOX RFP**

As discussed in response FR014–5, DOE selected DCS, of which Duke Engineering & Services is a member, to construct and operate the MOX facility. DOE does not believe that the involvement of other members of the nuclear industry is needed to implement the proposed surplus plutonium disposition program.

As discussed in response FR014–7, this SPD EIS addresses the disposition of 50 t (55 tons) of surplus plutonium. Disposal of waste generated by other government agencies, or generated as a result of any activity other than disposition of this surplus plutonium, is not within the scope of this SPD EIS.

FR014–12 **General SPD EIS and NEPA Process**

GAO trips to review nuclear technologies unrelated to the surplus plutonium disposition program are beyond the scope of this SPD EIS. Information on these trips can be obtained from the GAO Web site at www.gao.gov.

FR014–13 **General SPD EIS and NEPA Process**

The British waste program is unrelated to the surplus plutonium disposition program and is beyond the scope of this SPD EIS.

FR014–14 **General SPD EIS and NEPA Process**

DOE is unaware of the workshop referred to by the commentor.

FR014–15 **Other**

DOE acknowledges the commentor's suggestion of selling technology to the Japanese for safe disposal of their HLW.

DOE will continue to discourage Russia from reprocessing its spent nuclear fuel and starting a plutonium cycle but this issue, and the issue of Japan building a reprocessing facility are beyond the scope of this SPD EIS. U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons.

For the record nobody at the North Augusta Scoping meeting explained fully why we were going to send plutonium to Britain for reprocessing because we didn't plan for our own facility. 16

One comment stated that mixed oxide fuel is dirty. It involves four technologies used in Western Europe, some countries have been doing it for 30 years. What does dirty mean? Does it mean impurities as opposed to a higher grade of material? 17

Surely with so much money involved, we would try to develop some technologies to better manage the negative impacts of this process rather than importing somebody else's known problems. Why doesn't the French government put up some of the money? What is the procurement process for this deal? 18

SRS has a cooling tower(billions of dollars) that nobody knows what to do with and can it be incorporated in any of the plans? 19

Why are we telling a French oil company all about our weapons? The French government is apparently not discussing their weapons plutonium with our group. 5

Is this process a once through fuel cycle, with no reprocessing and subsequent reuse of the spent fuel? Can the fuel be blended again? Will this reduce waste from the spent MOX fuel? Would several cycles reduce the weapons grade of the material? 20

If Russia is already reprocessing material, then how does that fit in those stockpile reduction agreements. I read where the DOE couldn't even get a set of fire suits for the nuclear plants in Russia without them being stolen. How do we know if they are blending up or down? 21

Will Cogema be asking for amendments to the NPDES permit and other permits for SRS? Does France have the same regulatory reviews? I thought Bechtel was the construction contractor? What is BNFL doing with the MOX process? Who is the MOX process boss? Which one of the 81 outfalls, and 41 stormwater outfalls will be addressed by the new facilities? What is the water usage rate for the new facilities at SRS and where will the withdrawal be located? 22

FR014

FR014–16 **MOX Approach**

DOE does not have any plans to send surplus plutonium to Britain for reprocessing. There are no plans to reprocess MOX spent fuel if that is what the commentor is referring to.

FR014–17 **MOX Approach**

DOE is not aware of a comment referring to MOX fuel as dirty. It could be that the comment refers to the fact that reprocessed spent fuel is used in the production of European MOX fuel, and so has more impurities than the surplus plutonium that would be used in U.S. reactors under the MOX approach. DOE is not "importing" problems, but rather taking advantage of the recent European expertise.

FR014–18 **MOX RFP**

The surplus plutonium belongs to the U.S. Government. There is no need for the French government to contribute financially to this domestic, U.S. Government activity. France and the other G–8 nations (Group of Eight industrialized nations: Canada, France, Germany, Great Britain, Italy, Japan, Russia, and United States) are, however, contributing to Russia's surplus plutonium disposition activities.

The procurement process for U.S. MOX fuel fabrication activities was a competitive process. DOE issued a *Request for Proposals for MOX Fuel Fabrication and Reactor Irradiation Services* in May 1998. Responses were submitted in August 1998, after which a DOE source selection board reviewed the submitted proposals and awarded DCS the contract.

FR014–19 **Alternatives**

None of the proposed surplus plutonium disposition processes or facilities generates enough heat to require a cooling tower like the one referred to at SRS.

FR014–20 **MOX Approach**

MOX fuel, similar to traditional LEU fuel in the United States, would be used once. Technically, the fuel could be reprocessed and reused, but the United

States has a policy against reprocessing its spent fuel, and therefore does not reuse any of its spent fuel. MOX fuel is proposed for only two cycles versus three reactor cycles for some of the LEU fuel in the reactor. Two cycles would allow sufficient time for the MOX fuel containing the weapons-origin plutonium to be irradiated to a point that the plutonium cannot readily be extracted from the spent fuel and returned to weapons use.

FR014–21 **Nonproliferation**

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials. DOE will continue to discourage Russia from reprocessing its spent nuclear fuel and starting a plutonium cycle but this issue is beyond the scope of this SPD EIS.

FR014–22 **Water Resources**

If the proposed surplus plutonium disposition facilities necessitate modifications to the SRS NPDES Permit, the DOE SRS Office, working with the SRS environmental personnel and DCS, would request the modifications. At this time, the potentially affected outfalls have not been identified. None of the MOX activities, or any other surplus plutonium disposition activities, including construction, would be subject to French regulatory reviews. Bechtel is the SRS site construction support contractor, but construction of large, new structures are contracted for competitively. Major capital projects are not within the scope of the Bechtel contract. BNFL is not involved in this surplus plutonium disposition effort. As discussed in Section 4.26.4.2, the maximum amount of water used during construction of the proposed facilities is estimated to be 126 million l/yr (33.3 million gal/yr); during operations, the maximum water usage is estimated to be 216 million l/yr (57.1 million gal/yr). As discussed in Section 3.5.11.2.3, the source of this water is groundwater. If the proposed facilities are built at SRS, they would be located in F-Area. Sanitary water at SRS is supplied through the central domestic water system, and process and service water is supplied through deep-well systems within individual site areas.

The EIS indicates that Hanford has Pu residues with less than 50 percent Pu. That information was not technically explained as the text was deleted. If the percentage is not very great, then why it is listed for no further action? What is the difference in percentage of that and the MOX spent fuel? Many sites had Pu waste that was said to insignificant in quantity. Is quantity the criteria for risk? 23

How will Duke Power be protected, if Cogema's government orders them home? Will Duke Power get all the patents? We hope that Duke Power and North Carolina get the technology rights rather than the French. We are cheering for our team. We hope our country retains some technology and people in case of an emergency situation. I don't think other governments or oil companies will be working on any clean-up problems. The GAO/RCED-99-173 report stated that the Department of Energy receives much of its royalty incomes from inventions created in its laboratories by contractors, even though the inventions themselves are not government-owned. Where is the list of payers to the Department of Energy? Who got the MOX technology of 1969? Did SRS give the land for the MOX plant and other projects? The original withdrawal of land maps do not match the present maps given out at the public meetings. 24

Will Duke Power be given the same modification money as apparently was going to be given to those Canadian groups in the technical material?

Why does SRS import so much energy? I thought the national policy was to export. We have all these nuclear power companies in our area and we import. This policy does not go along with NEPA at all. We are terminating nuclear persons. Are we going to train them to be coal mine workers or work at oil terminals? 25

Certain regional nuclear facilities seem to have an excess capacity to bid on DOE projects but failed to participate with this project. I assume they want the disposal benefits but do not want to help with figuring out other processes. Apparently they do not even help with the disposal facility. Have they ever visited the disposal site that the American people are building for them? Do they do anything besides go to court? In other countries the operators have responsibility for the repository programs. Where are the proposals or preferred 11

FR014

FR014–23 **Alternatives**

Section 2.2 describes the materials that have been declared surplus and are being analyzed in this SPD EIS. In general, if the plutonium residues are greater than 50 percent they are considered part of the surplus plutonium disposition program. In some cases, residues with less than 50 percent plutonium are of concern because the plutonium could be easily concentrated to higher percentages. MOX spent fuel would have a relatively low percentage of plutonium; less than 10 percent. Other plutonium-bearing materials are beyond the scope of this EIS, but are addressed in other NEPA documents such as the *Final Environmental Impact Statement on Management of Certain Plutonium Residues and Scrub Alloy Stored at the Rocky Flats Environmental Technology Site* (DOE/EIS-0277F, August 1998).

FR014–24 **MOX RFP**

MOX fuel fabrication technology is being transferred from the MELOX plant in France to the United States. Because the MOX approach would be relying on the French technology, a clause was added to the special considerations of the contract to ensure that the U.S. Government, or anyone the Government hires to replace COGEMA, should a termination occur, has the right to use all proprietary data and restricted computer software necessary for the design, construction, operation and use of the MOX facility and provision of the MOX fuel irradiation as specified in the contract. Duke Power would negotiate a subcontract with DCS, the prime contractor to the Government. That subcontract would contain the rights Duke Power would have to retain patents developed under their subcontract with DCS. Although the GAO report is beyond the scope of this SPD EIS, in general, royalties are not paid to DOE for contractor-owned inventions and hence, there is not a central DOE list of such "payers."

The land identified for the proposed surplus plutonium disposition facilities at SRS is currently owned by DOE and will remain within the ownership of DOE.

McCracken, Patricia
Page 10 of 10

alternatives of the nuclear industry? Has anybody seen any scientific proposals from the Department of Defense outlining their preferences for their waste? How about NASA proposals? 11

The GAO report *Nuclear Waste Foreign countries' Approaches to High-Level Waste Storage and Disposal states* on page 30 that because France has adequate capacity for storing its wastes, developing a repository is not urgent. You may want to discuss this issue further with Cogema.

This report further states that Japan plans to increase its reliance on nuclear power over the next few decades in a continuing attempt to improve the country's energy dependence. " As part of their move toward energy independence, the Japanese plan to build a facility for reprocessing spent fuel from their nuclear power plants so that the recovered uranium and plutonium can be used as fresh reactor fuel." 15

We also heard from the DOE panel meeting with Mr. Nulton that Russia is now reprocessing nuclear fuel.

Will the MOX plant be based on the NRC's move to an approach-termed risk-informed regulation-that considers relative risk in conjunction with engineering analyses and operating experience to ensure that plants operate safely. We reference the GAO/RECED-99-95. 26

Let recap this picture. Our government has imported British and French technology for our nuclear needs. We also are importers of energy for the projects. That policy should make our country totally depend on others. And didn't I read in the news that we sold off all our oil reserves. What are the education institutions doing that have contracts with DOE? Just to make things even better, the contractors we hire and pay can take all the technology and patent the science and sell it to others. 5

Please someone explain this picture to me.

Thank you for the opportunity to comment.

FR014

FR014–25 **Infrastructure**

As discussed in Sections 3.5.11.1.2 and 3.5.11.1.3, SRS purchases its electricity locally, and generates process and heating steam at onsite coal- and oil-fired steam plants. U.S. policy on oil and energy production, and the nuclear industry and its workers are beyond the scope of this SPD EIS.

FR014–26 **MOX Approach**

The MOX facility would be licensed by NRC under 10 CFR 70. The application would be accompanied by detailed engineering information and safety analyses that would have to demonstrate that the MOX facility could operate safely and not pose a significant health and safety risk to the workers, the general public, or the environment.

SIPP, PETER FOX
PAGE 1 OF 2

June 14, 1999

To Whom this concerns:

I live in Richmond County, Georgia. Plant Votgle in 30 miles South and East of me. Due east is infamous SRS.

On February 24, 1999 at a MOX meeting sponsored by Nuclear Information & Resource Service in Augusta, GA I heard Mr. David Lochbaum tell us about his 17 years experience with commercial reactors. Mr. Lochbaum is now employed by Union of Concerned Scientists. Mr. Lochbaum says Plant Votgle nor any of the other reactors in our still beautiful country are not designed to burn plutonium. Mr. Lochbaum says plutonium would damage the reactors. Also he says plutonium is 10 times more expensive than uranium. 1

My light bill is already high enough. And y'all want it to go up!?!

No. Just No.

I want you all to know, I am highly insulted. A critical issue as this and no meeting hosted by you here in the Southeast? Humph!

This is the last straw. Only through a dear friend am I getting a chance to write.

There are many of us here in the Southeast who are going to unite. We are not going to just sit idly by any more. 2

Just as sure as gravity of the Sun is holding the planets in orbit, you will feel our presence.

Yours Renewably

Peter Fox Sipp

DCR004

DCR004–1 **MOX Approach**

Although no U.S. commercial reactors are licensed to use plutonium-based fuel, several are designed to use MOX fuel, and others can easily and safely accommodate a partial MOX core. These commercial reactors are capable of safely using MOX fuel. Section 4.28 was revised to discuss the environmental impacts of operating the reactors that would use MOX fuel.

Use of MOX fuel in domestic, commercial reactors is not proposed in order to generate electricity. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. DCS, the team contracted to fabricate and irradiate the MOX fuel, would not have to continue to use MOX fuel to support the surplus plutonium disposition program if it determined that it was uneconomical to operate the reactors. This would ensure that the taxpayers were not underwriting otherwise uneconomical electricity-generating assets.

DCR004–2 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's request for a hearing in the Southeast to discuss the use of MOX fuel in reactors. It should be noted that meetings were held in North Augusta, South Carolina on the SPD Draft EIS. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina. Moreover, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process should the MOX approach be selected.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD.

WILCOX, ROBERT H.
PAGE 1 OF 1

Thank you for sending me this document. I have no substantive comments on it. As a taxpayer, I object to the need to devote the government's money to documents of this nature. It really serves little useful purpose. The DOE and CEQ should find a simpler way of fulfilling NEPA and/or should suggest that Congress amend that Act. 1

WR004

WR004–1 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's suggestion that the NEPA process be improved. DOE works carefully to strike a balance between keeping the public informed about potential impacts from its proposed actions and controlling cost of the NEPA process.

WOMEN'S ACTION FOR NEW DIRECTIONS
JOAN O. KING
PAGE 1 OF 2

STATEMENT FOR THE DOE HEARING ON MOX NUCLEAR FUEL

June 15, 1999

I am Joan O. King. I am a member of WAND, Women's Action for New Directions. I work on nuclear issues for WAND and with other organizations in the Southeast. There is a wide network of individuals and NGOs in our area who are deeply disturbed by the DOE's plan to turn weapons-grade plutonium into nuclear fuel and burn it in commercial reactors.

There a number of reasons for our concern. We are not reactionary. We have studied the issue in some depth, but there is little point in going over the details. You are aware of the facts. The problem is, you don't appear to be paying much attention to them.

Everything we read indicates that some form of immobilization is a cheaper, faster way to handle the plutonium disposition problem. The excuse we hear from the DOE is that the Russians don't trust immobilization.....that they want a MOX solution. But we talk to the Russians too.

Their activists have been in Atlanta and the Southeast, and they tell us the Russian people don't want any more nuclear problems, the kind of problems that come with government nuclear programs and the ever increasing accumulation of polluting radioactive waste. 1

In the U.S. not one out of a thousand people has any idea what MOX stands for, but when they find out, they don't like it either. One indication of this is what happened at a recent Duke Energy Stockholders meeting when a stockholders initiative was introduced opposing the utility's plan to use MOX fuel in Duke reactors.

The initiative got close to eight percent of the vote, more than twice that needed to keep it on the ballot in the coming year. Since very few people even look at stockholder's petitions when they sign their proxy, and even fewer oppose the boards

DCR010

DCR010–1 **MOX Approach**

DOE acknowledges the commentor's concern regarding the use of weapons-grade plutonium in MOX fuel and irradiating it in commercial reactors. DOE has identified as its preferred alternative the hybrid approach which includes both immobilization and MOX fuel. As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach would be more expensive than the immobilization-only approach. However, pursuing the hybrid approach provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials.

Although the people of Russia may oppose any further nuclear programs, this issue is beyond the scope of this SPD EIS. Since the inception of the U.S. fissile materials disposition program, DOE has supported a vigorous public participation policy. It has conducted public hearings in excess of the minimum required by NEPA regulations at various locations around the country, not just near the potentially involved DOE sites, to engender a high level of public dialogue on the program. The office has also provided the public with substantial information in the form of fact sheets, reports, exhibits, visual aids, and videos related to fissile materials disposition issues. It hosts frequent workshops, and senior staff members make presentations to local and national civic and social organizations on request. Additionally, various

2

recommendations, the Duke vote is very significant. I can just about guarantee you stockholder opposition will grow. 1

For forty years nuclear engineers have tried to close the nuclear fuel cycle. It is an article of faith with them that eventually the problem of radioactive waste will be solved and somehow nuclear power can be made economically sustainable. MOX is just one more attempt. It is another step by the nuclear industry toward a plutonium economy, but the public isn't buying. That should be obvious by now.

Nuclear technology has NOT produced "....energy too cheap to meter." Instead it has produced energy too expensive to use, and NO solution to radioactive waste. 2 The DOE doesn't have a very good track record, and the public doesn't want to see them expand into a new and very expensive nuclear program, one that will produce even more radioactive waste.

MOX is just one more subsidy to a failed industry. Our government owes the public something better than this.

DCR010

means of communication—mail, a toll-free telephone and fax line, and a Web site (http://www.doe-md.com)—have been provided to facilitate the public dialogue.

DCR010–2 **DOE Policy**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

Citizens Advisory Board

Idaho National Engineering and Environmental Laboratory

99-CAB-008

January 27, 1999

William B. Richardson
Secretary of Energy
U.S. Department of Energy, Headquarters
1000 Independence Avenue, S.W., MS 7E-079
Washington, DC 20585

Dear Secretary Richardson:

The Idaho National Engineering and Environmental Laboratory (INEEL) Citizens Advisory Board (CAB) understands that consideration is being given to alternative strategies for meeting the requirements of the Idaho Settlement Agreement. In particular, we have been told that one option would involve shipping transuranic (TRU) waste from INEEL to a location other than the Waste Isolation Pilot Plant (WIPP). As I am sure you are aware, the legally binding Idaho Settlement Agreement requires the U.S. Department of Energy to make a shipment of TRU waste out of Idaho by April 30, 1999.

The uncertainty of WIPP opening in time to receive Idaho's initial shipment gives rise to concerns that DOE's Idaho Operations Office (DOE-ID) will not be able to meet that critical compliance deadline. Such a failure to meet the commitments in the Idaho Settlement Agreement will not sit lightly with the Idaho citizens. The INEEL CAB recognizes the magnitude of the dilemma DOE faces should WIPP disallow or delay the INEEL shipment past the April 30, 1999 deadline.

We are also alert to DOE's plans for receipt of foreign research reactor spent nuclear fuel (FRR SNF) from Savannah River Site to the INEEL in the Summer of 1999 and the fact that non-compliance with the April 30, 1999 milestone will preclude receipt of that shipment at the INEEL.

The INEEL CAB recognizes the additional and perhaps significant leverage that prohibiting receipt of the FRR SNF would add to existing pressures to open WIPP. Indeed, we contemplated making a CAB recommendation to preclude consideration of any alternatives to WIPP in order to keep the pressure on DOE to do everything possible to get WIPP open. In light of the INEEL CAB's numerous expressions of strong support for the Idaho Settlement Agreement, however, we found ourselves in a dilemma. We concluded that it would be irresponsible for the CAB to condone or advocate non-compliance with the legally binding Idaho Settlement Agreement. Doubtless such a position would severely jeopardize our integrity as a citizen advisory board.

The INEEL CAB has ardently supported the opening of WIPP based on considerable deliberation, and we want to do what we can to support efforts to open the facility. We recognize that the Idaho Settlement Agreement does not require shipment to WIPP, but allows shipping to an "other such facility." Despite a presentation by DOE-ID at our January 1999 Board meeting (which we believe conveyed as much information as DOE-ID staff felt was appropriate), we find that we know too little about any alternative strategies for complying with the Idaho Settlement Agreement. We believe that any shipment of nuclear materials to any location should not increase risks to human health or the environment during transportation and/or subsequent interim storage. Said another way, we believe that shipment and storage risks at an alternative site should provide advantages to continued in-place temporary storage at the INEEL.

The INEEL CAB has yet to achieve consensus that any alternative to WIPP is acceptable. We will not even attempt trying to achieve consensus on an alternative site again until such

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Attachment 10

FR001

time as we have received additional information about viable alternative site(s) and assurances that the site(s) would present no more risk to human health and the environment than the risk posed by leaving the material where it is presently temporarily stored. In addition, some of our members note that the remaining roadblocks to acceptance of waste at WIPP allow a conclusion that it might never open. At least some of our members feel that it would be negligent for the INEEL CAB to accept shipment to a storage facility that might become a de facto disposal facility in time, especially if that facility is not appropriate for long term stewardship.

In sum, we are not yet able to support a strategy that would involve shipping even a small quantity of TRU to an alternative site. Until such time as we can reach consensus in support of an alternative to WIPP, we will therefore continue to urge DOE to make every effort to accelerate WIPP opening and to make every effort to comply with the Idaho Settlement Agreement. In light of the expected sequence of events, we are frustrated and disappointed that we cannot provide advice to DOE on this issue. Very few challenges faced by DOE are of this magnitude, and we would be negligent to ignore the situation.

We therefore respectfully request a presentation at our March meeting to provide us with an enhanced understanding of the options that DOE might consider for complying with the Idaho Settlement Agreement, assuming that WIPP will not open in the near term. We need such a presentation to meet our members needs for additional information before we can try to reach consensus on what we think DOE should do to resolve this apparent dilemma. We are directing this request to DOE-Headquarters as we believe we have already received as much information from DOE-ID as we will be able to get.

We interpret our commitment to consensus as requiring active consideration of the information available to support a rational conclusion. As a rule, we do not support DOE decisions in the absence of information that would allow us to conclude that DOE has, in fact, selected the best option. As a result, we would like sufficient information about a full range of options to allow our entire membership to determine how comfortable they are with each option.

We understand that DOE might not really want our advice on this pending decision. We recognize that a multitude of political and social pressures will come to bear and that the decision may fall outside the Department's purview. We urge you to embrace this request in its sincerity and allow us to serve you as originally intended—as an independent body of citizens that provide advice on issues of relevance and importance.

We await your reply and stand ready to accommodate the needs of the presenter of your choosing.

Sincerely,

Charles M. Rice
Chair, INEEL CAB

cc: John Wilcynski, DOE-ID
James Owendoff, DOE-HQ
Stan Hobson, INEEL CAB Transuranic Waste Committee
Martha Crosland, DOE-HQ
Fred Butterfield, DOE-HQ
Jerry Bowman, DOE-ID
Woody Russell, DOE-ID
Patty Natoni, DOE-ID
Wendy Green Lowe, INEEL CAB Facilitator

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FR001

CITIZENS ADVISORY BOARD, INEEL
CHARLES M. RICE
PAGE 1 OF 5

Citizens Advisory Board

Idaho National Engineering and Environmental Laboratory

99-CAB-081

July 20, 1999

Laura S. H. Holgate
U.S. Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, DC 20026-3786

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Charles M. Rice

Vice Chair:
Stanley Hobson

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Kathleen Trever
Wayne Pierre
Gerald C. Bowman

Jason Staff:
Carol Cole
Amanda Jo Edelmayer
Kathy Grebstad
Wendy Green Lowe
Kevin Harris
Lori DeLuca

Dear Ms. Holgate:

Note: The Site-Specific Advisory Board (SSAB) for the Idaho National Engineering and Environmental Laboratory (INEEL), also known as the INEEL Citizens Advisory Board (CAB), is a local advisory committee chartered under the Department of Energy's (DOE) Environmental Management SSAB Federal Advisory Committee Act Charter.

Attached please find a recommendation from INEEL CAB to the U.S. Department of Energy regarding the Supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement. The recommendation was achieved through consensus on July 20, 1999 at a meeting of the full INEEL CAB held in Idaho Falls, Idaho.

In a letter dated June 11, 1999, the INEEL CAB requested an extension in the comment period for this document. We have received no response to that request. We have been told by Patty Natoni (DOE-ID's Assistant Coordinator for the INEEL CAB), however, that no extension was granted. We nonetheless preferred to attempt consensus on this recommendation before submitting it, and note that we are aware it will be received past the end of the public comment period. 1

We await your response to this recommendation.

Sincerely,

Charles M. Rice
Chair, INEEL CAB

cc: Stanley Hobson, INEEL CAB Transuranic Waste Committee Chair
Beverly Cook, DOE-ID

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FR019

FR019–1 **General SPD EIS and NEPA Process**

Although it did not extend the comment period, DOE did consider all comments received after the close of that period for the *Supplement to the SPD Draft EIS*. All comments were given equal consideration and responded to as presented in Volume III, Chapter 4.

Carolyn Huntoon, DOE-HQ
Martha Crosland, DOE-HQ
Fred Butterfield, DOE-HQ
Larry Craig, U.S. Senate
Mike Crapo, U.S. Senate
Mike Simpson, U.S. House of Representatives
Helen Chenowith, U.S. House of Representatives
Laird Noh, Chair, Idaho Senate Resources and Environment Committee
Golden C. Linford, Chair, Idaho House of Representatives Resources and Conservation Committee
Jack Barraclough, Idaho House of Representatives Environmental Affairs Committee
Gerald Bowman, DOE-ID
Kathleen Trever, State of Idaho INEEL Oversight
Wayne Pierre, U.S. Environmental Protection Agency Region X

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FR019

Citizens Advisory Board, INEEL
Charles M. Rice
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Citizens Advisory Board
Idaho National Engineering and Environmental Laboratory

Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement

The Surplus Plutonium Disposition (SPD) Environmental Impact Statement (EIS) is being prepared to support the U.S. Department of Energy's (DOE) decisions related to the management and disposition of surplus plutonium. The Idaho National Engineering and Environmental Laboratory (INEEL) Citizens Advisory Board (CAB) has persistently requested copies of the SPD EIS and related documentation, including the Supplement to the draft EIS that was released for public comment on May 14, 1999. In addition, the CAB has submitted two consensus recommendations to date on the EIS.

DOE's reluctance to provide adequate numbers and timely distribution of the Supplement leads this Board to conclude that the DOE is disinterested in comments generated by citizen groups. Additionally, it is this Board's distinct impression that the Office of Fissile Materials Disposition is, at best, nonchalant about the concerns of a Site Specific Advisory Board chartered and funded under the U.S. Department of Energy's (DOE) Environmental Management program. 2 The INEEL is considered as an alternative for two of the three facilities evaluated in the EIS, including a facility to disassemble pits and another to fabricate plutonium dioxide. INEEL is not considered a preferred site for either facility at this point in time. We are nonetheless interested in this important decision.

We understand that our prior recommendations on the EIS may be reflected in the comment response document that will be included with the final EIS. We are disappointed, however, to find no evidence in the Supplement that our prior recommendations are being considered. We had recommended that the EIS provide vigorous analysis (equivalent to that provided for the other alternatives) of a "full immobilization alternative" involving immobilization of the entire inventory (50 tons) of weapons-usable plutonium. Our specific comment on the Draft EIS was "The INEEL CAB recommends that the total immobilization option be given full consideration and rigorous discussion in this EIS." 3

The Supplement offers further evidence that DOE prefers the "hybrid" alternatives (those involving fabrication of some inventory as mixed oxide fuel [MOX]), despite the fact that the Draft EIS did not include analysis of the full immobilization alternative. DOE's awarding of a $130 million contact to "further develop the MOX options" (involving actions that would be completely unnecessary under the full immobilization alternative) provides further evidence that a decision has already been made. In addition, the contractor has suggested modifications of processes within the alternatives and DOE has made those modifications. 4

RECOMMENDATION # 60 July 20, 1999
Page1

FR019

FR019–2 **General SPD EIS and NEPA Process**

Since the inception of the fissile materials disposition program, DOE has supported a vigorous public participation policy. Approximately 1,300 copies of the *Supplement* were mailed, and Notice of Availability postcards were mailed to an additional 5,800 members of the public. Various means of communication—public hearing, mail, a toll-free telephone and fax line, and a Web site (http://www.doe-md.com)—were provided to facilitate the public dialogue. The channels of communication were open to all interested individuals and organizations.

FR019–3 **Alternatives**

The purpose of the *Supplement* was to give the public the opportunity to comment on the reactor-specific information that was not available at the time the SPD Draft EIS was published. The *Supplement* included the Environmental Synopsis (prepared on the basis of the Environmental Critique which DOE also prepared for the source selection board to consider prior to the award of the MOX fuel fabrication and irradiation services contract), a description of the affected environment around the three proposed reactor sites, and analyses of the potential environmental impacts of operating these reactors using MOX fuel (Appendix P and Sections 3.7 and 4.28 of this SPD EIS, respectively). Comments on the SPD Draft EIS and their responses are presented in Volume III, Chapter 3.

Both the draft and final SPD EIS analyze "full immobilization alternatives" where all 50 t (55 tons) of surplus plutonium would be immobilized at either Hanford or SRS, with pit disassembly and conversion taking place at either Pantex or SRS. In this SPD EIS, a total of four "full immobilization alternatives" (Alternatives 11A, 11B, 12A, and 12B) are analyzed, all of which have been given full consideration.

FR019–4 **General SPD EIS and NEPA Process**

DOE has prepared this SPD EIS in accordance with the provisions of NEPA (42 U.S.C. 4321 et seq.) and the related CEQ and DOE implementation regulations (40 CFR 1500 through 1508 and 10 CFR 1021, respectively). The primary objective of the EIS is a comprehensive description of proposed surplus plutonium disposition actions and alternatives and their potential

The INEEL CAB understood that the National Environmental Policy Act (NEPA) requires federal agencies to (1) evaluate the impacts of a full range of reasonable alternatives and (2) provide the public an opportunity to review and comment on the results of that analysis **before** making a decision that might have significant environmental impacts. It appears that DOE chose its preferred course of action behind closed doors, prior to completing its analysis of a full range of alternatives and without the benefit of public participation. Hence, the INEEL CAB suggests that DOE's strategy for compliance with NEPA is flawed. 4

The Supplement states that the facilities and associated work forces will be much larger than had been indicated in the draft EIS. Such adjustments may be proper and appropriate. We question, however, how a doubling of floor space and a significant increase in the work force would have no effect on the rate of treatment or on the rate of total output. **The INEEL CAB recommends that the Final EIS provide additional explanation as to why DOE believes the increases are necessary. The CAB also recommends the addition of an explanation as to why the increases would not result in any increase in the rate of treatment nor the rate of total output of treatment.** 5

The INEEL CAB recommends that the final EIS include a thorough presentation of all costs associated with making the MOX fuel (that would be fabricated under the hybrid alternatives) viable for use by the private power industry. Such costs could include 1) retrofitting of reactors (if needed), 2) relicensing of reactors (when necessary), and 3) providing financial incentives to encourage the power industry to burn MOX fuel instead of other, less expensive fuels. Such information is needed to allow the public to compare among the alternatives considered and evaluated. 6

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Page2

FR019

environmental impacts. DOE has analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for the proposed surplus plutonium disposition facilities. As discussed in Section 2.1, the disposition facility alternatives, immobilization technology alternatives, and MOX fuel fabrication alternatives evaluated are consistent with the decisions given in the ROD for the *Storage and Disposition PEIS*. Impacts for both technologies and all alternatives are summarized in Section 2.18 and Chapter 4 of Volume I, and complete analyses are provided in the appendixes. Alternatives 11 and 12, the 50-t (55-tons) immobilization cases, are fully analyzed.

DOE conducted a procurement process in accordance with DOE NEPA regulations 10 CFR 1021.216. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. As stipulated in DOE's phased contract with DCS, until and depending on the decisions regarding facility siting and approach to surplus plutonium disposition are made and announced in the SPD EIS ROD, no substantive design work or construction can be started by DCS on the MOX facility. Should DOE decide to pursue the No Action Alternative or the immobilization-only approach, the contract with DCS would end. The contract is phased so that only nonsite-specific base contract studies and plans can be completed before the ROD is issued, and options that would allow construction and other work would be exercised by DOE if, and only if, the decision is made to pursue the MOX approach.

FR019–5 **Immobilization**

As discussed in Section 1.7.4, increased space requirements were incorporated into this SPD EIS to accommodate several refinements to the immobilization and MOX facilities designs analyzed in the SPD Draft EIS. Changes to the immobilization facility design include lengthening the process gloveboxes; doubling the material conveyor length; changing to a vertical ceramification stack; increasing the heating, ventilation, and air conditioning systems and electrical support to correspond with the increased process space; enlarging the space required for maintenance activities; and increasing the size of the canister loading facility. These design changes correspond with increased operating workforce requirements of approximately 24 to 33 percent, on average, at Hanford and SRS.

The increased space requirements associated with the revised MOX facility design reflect additional space proposed by DCS; incorporation of a plutonium-polishing capability; and incorporation of administrative space that had been proposed within separate support facilities in the SPD Draft EIS. Although the size of the MOX facility has increased, DCS proposes to operate the facility with approximately 11 percent fewer workers.

None of these modifications are associated with increasing (or decreasing) the total capacity or throughput of either facility; rather, they simply reflect refinements to each facility's proposed dimensions, process design, and associated workforce. As stated in Section 2.4, the immobilization facility would still disposition up to 5 t (5.5 tons) per year over a ten-year period to accommodate alternatives for immobilizing all 50 t (55 tons) of plutonium. The same facility would immobilize an average of 1.7 t (1.9 tons) per year over a ten-year period under the hybrid alternatives. Similarly, the MOX facility would still process an average of 3.3 t (3.6 tons) per year over a ten-year period under all hybrid alternatives.

FR019–6 **Cost**

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

COALITION 21
GEORGE A. FREUND
PAGE 1 OF 1

Coalition 21 has previously whole heartedly supported the MOX strategy for disposing of surplus-weapons-useable plutonium. Nothing in the Supplement to the DEIS causes us to waver in that support. MOX not a bomb project but a true example of the Atoms for Peace concept visualized by President Eisenhower. Of all forms of plutonium, surplus weapons-useable plutonium presents a threat to proliferation of nuclear weapons second only to theft of existing nuclear weapons by terrorists. The nuclear fuel produced by the MOX process would be used "once-through" in commercial nuclear power reactors. This step would eliminate much of the plutonium. The remainder would achieve the standard recommended by the National Academy of Science to make plutonium unattractive for use in weapons. The end product from this use would merely replace an equivalent amount of spent nuclear fuel that meets the same standard. The argument by MOX opponents that this strategy furthers a "plutonium economy" is at the least overblown. Russian scientists argue that immobilization (the alternative preferred by MOX opponents) leaves the plutonium in a weapons-useable form that can be chemically retrieved. Simply put, immobilization might deter terrorists from attempting to retrieve the plutonium but it would not discourage a government (including our own in Russia's eye) from doing so. We see merit in that argument. 1

WR008

WR008–1 **Alternatives**

DOE acknowledges the commentor's full support of the MOX approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

NAS is currently conducting studies to confirm the ability of the ceramic can-in-canister immobilization approach to meet the Spent Fuel Standard. DOE is confident that immobilization remains a viable alternative for meeting the nonproliferation goals of the surplus plutonium disposition program.

Huebner, Martin
Page 1 of 2

Subject: Plutonium disposition via electric power reactor
Comments: In over thirty years of environmental activism as a private citizen (in probably a hundred formal public hearings in the Western U.S.) I have learned several almost immutable facts. Bear in mind these hearings were primarily on natural resource issues regarding dams, timber cuts, mining, fish and game issues, etc. but a small percentage were also DOE hearings.

1) There are those whose call themselves "environmentalists," and assume this fasle identity when attending DOE hearings. They apparently cloak themselves in this assumed identity to provide a false a false mantle of respectability and responsibility. The rest of the time they refer to themselves in such terms as "nuclear watchdogs" or "peace and ….." advocates. 1

2) In these hundred or so hearings, NOT ONCE did I hear even one representative of these ad hoc "environmental" groups appear, and provide a statement when natural resource issues were the subject of the hearing. These ad hoc "environmentalists" only seem to "come out of the wood works" to belabor the DOE whenever the Department has proposals to accomplish something.

3) Although some representatives of these groups are expert at pointing picayune details and minor flaws in DOE plans (which some might consider a useful service) I have yet to hear them provide even ONE significant constructive comment that would help resolve the issue being discussed.

WR005

WR005–1 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's support for the MOX approach.

It is DOE policy to encourage public input into these matters of national and international importance. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

4) There are a few of these groups that apparently have any people with credentials in the issues being discussed; the representatives are long on rhetoric and pitifully meager in specifics or in related facts. I have been a representative of a venerable (since 1932) environmental organization at recent regional and national "stakeholder" meetings on nuclear waste sponsored by the League of Women Voters. Although the LOWV meetings were well organized, I found few attendees of the "environmentalists/nuclear watchdog" variety who wanted to even hear facts about nuclear wastes, much less discuss them.

5) I understand that a coalition of some 100 international non-government groups have gone on record opposing the plans to convert former weapons-grade plutonium into nuclear reactor fuel for commercial nuclear nuclear power plants. When viewed objectively, as well as from a realistic environmental perspective, the opposition to such plans that directly support international peace objectives is mystifying. I do not understand why such construction plans are opposed by any rational person or group. 1

In view of the above facts and observations, I recommend that the DOE respectfully review the statements of those opposed to ridding the world of weapons grade plutonium in nuclear reactors, then dismiss them for the demagoguery and untruths that they truly are.

WR005

KENNEY, RICHARD A.
PAGE 1 OF 1

Subject: Solve the Problem

Comments: The use of surplus weapons grade PU in the production of MOX and the burning of that MOX fuel in commercial reactors is the only proposed alternative that rids the earth of weapons grade PU. Vitrified weapons grade PU can safely be converted back to a weapons usable PU in a bath tub. Thus, the non MOX alternatives require storage and heavy security protection for thousands of years. I and all my family, associates, and friends strongly support the MOX alternative. 1

WR009

WR009–1 **MOX Approach**

DOE acknowledges the commentor's full support of the MOX approach. NAS is currently conducting studies to confirm the ability of the ceramic can-in-canister immobilization approach to meet the Spent Fuel Standard. DOE is confident that immobilization remains a viable alternative for meeting the nonproliferation goals of the surplus plutonium disposition program.

- LEAVE NUCLEAR WASTE ON SITE
- AVOID THE RISKS OF HAULING TOXIC WASTE 1
- FORGET MOX, ITS MORE TOXIC THAN PLUTONIUM 2
- COMMUNITIES NEAR CHOSEN REACTOR SITES HAVE A RIGHT TO EXPRESS THEIR WISHES. 3

STOP THIS NUCLEAR
MADNESS
NOW

- **MOX is dangerous.** The use of MOX in the U.S. sends the wrong signal to Russia and the rest of the world: that Americans regard plutonium as a valuable energy source rather than a dangerous waste. ***It encourages other nations to embrace a plutonium fuel economy,*** leading to increased worldwide trade of plutonium and greater risks to international security, public health and the environment. Plutonium, among the most dangerous of substances, is so lethal that just a speck can cause cancer in humans. A recently-released study by the Nuclear Control Institute finds that ***a severe accident at a reactor fueled with MOX could cause twice as many fatal cancers as an identical accident at a uranium-fueled reactor.*** 2

- **MOX is slower and more expensive.** Immobilization is estimated to cost less than MOX and complete the job years sooner. Utilities will only use MOX fuel when it is heavily subsidized by the US government; taxpayers would be paying utilities to use MOX.

- **MOX is not needed.** Immobilization is now successfully underway at the Savannah River Plant in South Carolina and at the West Valley Demonstration Project in New York. Immobilization can handle a wider variety of surplus plutonium forms (residues, oxides, metals, etc.) as compared to MOX. Furthermore, the use of MOX fuel made from weapons-grade plutonium has not been proven to work in U.S. commercial reactors. 4

- **MOX is not wanted.** In March 1998 more than 200 non-governmental organizations worldwide called upon Presidents Clinton and Yeltsin to halt the MOX development program and protested the use of plutonium as an energy source. Hundreds of international organizations have signed on to a similar statement this year. Both the Oregon State Legislature and the Texas Farm Bureau have passed resolutions opposing the use of MOX. Newspapers including the Denver Post, located near the Rocky Flats Plant which stores 14 of the 50 tons of surplus plutonium, and newspapers throughout the Southeast U.S. where the first stage of MOX use is set to begin, have editorialized against MOX. 3

FR011

FR011–1 **Alternatives**

DOE acknowledges the commentor's preference for the No Action Alternative and concern about the shipment of nuclear material and waste. Continued onsite storage would only defer a decision regarding the disposition of surplus plutonium, and therefore would only defer the impacts of plutonium disposition activities. Eventually, these materials would have to be disposed of. In addition, continued storage of surplus plutonium at the sites where it is currently located could delay site cleanup and closure.

Section 2.18 and Table L–6 summarizes the transportation impacts associated with all the alternatives. These estimates show that additional fatalities are unlikely. As stated in Appendix L.3.2, DOE has accumulated more than 151 million km (94 million mi) of over-the-road experience transporting DOE-owned cargo, including plutonium, with no accidents that resulted in a fatality or release of radioactive material. The transportation of routine shipments of wastes are discussed in Appendix L.6.4.

FR011–2 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. Use of MOX fuel in domestic, commercial reactors is not proposed in order to advocate a plutonium economy. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

Chapter 4 of Volume I provide the results of detailed impact analyses of the proposed surplus plutonium disposition facilities and reactors. Risks and consequences are addressed. The impacts on workers and the general population associated with normal operations and postulated accidents are included in these analyses, as well as the potential impacts on the environment. The impacts associated with each alternative are summarized in Section 2.18.

FR011–3 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's view that communities near the proposed reactor sites that would use the MOX fuel have the right to express their wishes. During the 45-day public comment period on the *Supplement to the SPD Draft EIS*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. For those interested parties who could not attend the hearing on the *Supplement*, DOE provided various other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina. Moreover, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process should the MOX approach be pursued per the SPD EIS ROD.

Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

FR011–4 **Alternatives**

DOE has identified as its preferred alternative the hybrid approach which includes both immobilization and MOX fuel. As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach would be more expensive than the immobilization-only approach. However, pursuing the hybrid approach provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

BLUESKY RESEARCH
PAGE 3 OF 3

Although no U.S. commercial reactors are licensed to use plutonium-based fuel, several are designed to use MOX fuel, and others can easily and safely accommodate a partial MOX core. These commercial reactors are capable of safely using MOX fuel. Section 4.28 was revised to discuss the environmental impacts of operating the reactors that would use MOX fuel.

Comments of Lisa Ledwidge, Institute for Energy and Environmental Research, at the U.S. Department of Energy public hearing on the supplement to the draft Surplus Plutonium Disposition Environmental Impact Statement, June 15, 1999

My name is Lisa Ledwidge. I am the Outreach Coordinator at the Institute for Energy and Environmental Research, a non-profit organization in Takoma Park, Maryland. I coordinate a project that provides technical assistance to grassroots groups around the country on nuclear issues.

I have three questions and a comment for the Department of Energy (DOE) regarding the supplement to the draft Surplus Plutonium Disposition Environmental Impact Statement.

1. When will the DOE grant the public access to the home-country environmental and public and worker health record of Cogema (the French company that is a member of the consortium that DOE contracted for mixed-oxide [MOX] fuel fabrication and irradiation)? The American people have a right to access this information on the same basis that DOE documents would be available to the public here in the U.S. 1

2. Who holds the liability for potential accidents with or failures of the MOX program in Russia? This question has not been addressed in any DOE public document as far as I am aware. However, it is a very important one, given the economic situation in Russia, the questionable safety status of Russian reactors, and the current or potential role of the US in financing or otherwise promoting the joint U.S.-Russian MOX disposition plan. This is an especially important question in light of the fact that the Russian MOX program will use light water reactors, a plan the Russian government is adopting at the urging of the U.S. Minatom (DOE's Russian counterpart) would actually prefer to use breeder reactors. 2

3. How does the DOE justify the militarization of civilian nuclear power plants in which it proposes to irradiate MOX fuel? (By militarization, I refer to the transportation and storage of MOX fuel, made with military plutonium, to and at commercial nuclear power plants. Some may think this too strong a term, but in reality what DOE is proposing to do is locate fuel made with military plutonium at civilian sites.) In addition, what provisions are planned for the significant change in status of civilian nuclear power plants to military or quasi-military sites, since they will at least temporarily be storing unirradiated MOX fuel which can, relatively readily, be converted to weapons-usable material? 3

One final comment. It is beyond my understanding why the DOE would deny, after repeated requests, public hearings in the communities around the North Anna, Catawba and McGuire reactors. The DOE has responded to this with something like, More than 80 hearings have been held on this EIS, and people can comment in other ways. If DOE has held 80 hearings, then why were not a few of them held in reactor communities? Alternatively, if DOE has held 80 hearings, how much trouble could have been three more? 4

I look forward to answers to these questions in the near future. Thank you very much for this opportunity to comment.

DCR016

DCR016–1 **MOX RFP**

DOE considered past environmental performance of COGEMA in awarding the contract for MOX fuel fabrication and irradiation services. The operating experience at MELOX is being factored into the MOX facility design and was used to update information in this SPD EIS as discussed in Appendix P. More information on COGEMA's environmental record can be found on their Web site at http://www.cogema.com or by contacting Ms. Christi A. Byerly. Her address is: 7401 Wisconsin Avenue; Bethesda, MD 20814. She may also be contacted by telephone at (301) 941-8367. Her fax number is (301) 652-5690, and her email address is cbyerly@cogema-inc.com.

DCR016–2 **Nonproliferation**

DOE acknowledges the commentor's concerns regarding the liability for potential accidents or failures of the MOX program in Russia, although programmatic and policy issues such as U.S. policies toward plutonium disposition in Russia are beyond the scope of this SPD EIS. The scope of this SPD EIS is focused on analysis of alternatives on whether and how much U.S. surplus plutonium should be used as MOX fuel, which technology should be used for immobilization, where to construct the proposed surplus plutonium disposition facilities that are needed, and where to perform lead assembly fabrication and testing.

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials.

Understanding the economic dilemma in Russia, the U.S. Congress has appropriated funding for a series of small-scale tests and demonstrations of plutonium disposition technologies jointly conducted by the United States and Russia. For fiscal year 1999 (starting October 1998), Congress further appropriated funding to assist Russia in design and construction of a plutonium conversion facility and a MOX fuel fabrication facility. This funding

INSTITUTE FOR ENERGY AND ENVIRONMENTAL RESEARCH
LISA LEDWIDGE
PAGE 2 OF 3

would not be expended until the presidents of both countries signed a new agreement. Although the amount appropriated by Congress is not sufficient to fund the entire Russian surplus plutonium disposition program, the United States is working with Russia and other nations to resolve this issue.

Breeder reactors are designed to create plutonium as they burn MOX fuel. The plutonium in the spent fuel is then separated for reuse (reprocessed) as new MOX fuel. Since using MOX fuel in breeder reactors would produce plutonium, DOE believes there are significant nonproliferation concerns regarding the use of breeder reactors for the disposition of surplus weapons-usable plutonium.

DCR016–3 **DOE Policy**

Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

In order to address security against terrorist-related incidents, all intersite shipments of weapons-usable plutonium for the surplus plutonium disposition program would be made using DOE's SST/SGT system. This involves having couriers that are armed Federal officers, an armored tractor to protect the crew from attack, and specially designed escort vehicles containing advanced communications equipment and additional couriers. Further, DOE does not anticipate the need for any additional security measures at reactor sites, other than for the additional security applied for the receipt of fresh fuel. Commercial reactors currently have armed security forces, primarily to protect against perimeter intrusion. There would be increased security for the receipt and storage of fresh MOX fuel, as compared with that for fresh LEU fuel, for additional vigilance inside the perimeter. However, the increased security surveillance would be a small increment to the plant's existing security plan. After irradiation, the MOX fuel would be removed from the reactor and managed with the rest of the spent fuel from the reactor, eventually being disposed of at a geologic repository built in accordance with the NWPA.

DCR016–4 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's concern that DOE has denied repeated requests for public hearings near the proposed reactor sites that would use the MOX fuel. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

INSTITUTE FOR ENERGY AND ENVIRONMENTAL RESEARCH
LISA LEDWIDGE
PAGE 1 OF 1

This is Lisa Ledwidge with the Institute for Energy and Environmental Research. My telephone number is (301) 270-5500. I would like to register for the hearing on June 15th. I'm not sure if you need me to say whether I will go to the earlier or the later one. I'll probably go to the 9:00 AM one. Also on a second point, I'd like to leave is a request for more hearings in the areas affected by the Supplemental, including the reactor communities and the transportation corridors. Thank you. 1

PR001

PR001–1 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's request for additional public hearings in areas affected by the use of MOX fuel, including the reactor and transportation corridor communities. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE felt there were sufficient other means provided for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

ieer
INSTITUTE FOR ENERGY AND ENVIRONMENTAL RESEARCH
6935 Laurel Avenue, Suite 204
Takoma Park, MD 20912
Phone: (301) 270-5500
FAX: (301) 270-3029
e-mail: ieer@ieer.org
http://www.ieer.org

Comments of the Institute for Energy and Environmental Research (IEER) on the on Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement (DOE/EIS-0283-DS, April 1999)
by
Arjun Makhijani
28 June 1998

The Final EIS should include the features described in the comments below.

1. According to various statements of the Department of Energy (DOE) and its contractors, the proposed use of mixed oxide fuel to disposition surplus plutonium from the US nuclear weapons program is based on the experience of the use of MOX in European light water reactors (LWRs). The DOE should explicitly analyze reactor control, cost, and accident-probability and consequence issues with this in mind. It has not done so in the Draft Supplemental EIS. DOE should specify exactly what European experience it is relying on for making its decision on its MOX program, what reactors use MOX in Europe and how they correspond to the proposed reactors in the United States in terms of safety features, control rods, etc. DOE should make this European data public as part of its Final EIS. The DOE should provide a detailed comparison of the reactors of the proposed vendors Duke Power and Virginia Power with the French reactors in which MOX fuel is used in terms of their (i) safety features, (ii) control rod design and quantity as well as other reactor control features; (iii) design aspects related to emergency core cooling and containment of an accident. For instance, unlike some US reactors, the reactors in France's MOX program do not rely on ice condensers as a safety feature.

2. If DOE believes that the safety features of US and French and/or other European reactors are materially the same it should so state, and provide the justification for it. If the DOE is relying on French or European reactor safety experience and design features, it should justify this. In that case the DOE should make an explicit commitment that whatever safety issues come up in the in the future in the French or European MOX programs (respectively) would also be addressed in the US disposition program. The DOE should make a commitment to seek approval from the NRC about its assumptions regarding the similarities and differences in the safety and control features of the French reactors relative to the six reactors now proposed to be included in the MOX program as well as any reactors that might be added in the future.

1

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FR004

FR004–1 **MOX RFP**

The proposed reactor utilities will use existing accident-probability and consequence analysis tools, techniques, and data in the development of their NRC license application amendments. These tools include approved PRA models and modeling techniques. Techniques include the assessment of various failure modes, root cause analysis, site-specific conditions and plant equipment, systems, and components. Data will include appropriate national and international information.

The plant and site-specific information will include the analysis of the "defense in depth" methodologies which provide specific boundaries for the radionuclides. The first boundary is the fuel rod itself. The second is the reactor and steam supply system. The third is the reactor containment vessel. There are several fuel designs, reactor types, and containment types. The "ice condenser" containment is only one type.

European reactors of various designs use MOX fuel. French and Belgian reactors are based on a Westinghouse design, and are similar to the McGuire, Catawba, and North Anna reactors. European nuclear regulatory authorities in France, Germany, Belgium, the Netherlands, and Switzerland have reviewed MOX fuel use in reactors of varying designs.

Before any MOX fuel is used in U.S. reactors, NRC must perform a comprehensive and public safety review and issue a revision to the reactor operating licenses. Under NRC regulations, the utilities would have to provide information in their licensing submittals, which would prove their ability to operate within existing specifications.

INSTITUTE FOR ENERGY AND ENVIRONMENTAL RESEARCH
ARJUN MAKHIJANI
PAGE 2 OF 3

3. The Final Supplemental EIS should state that the percentage of plutonium-239 in the core of the reactors proposed to be used in the disposition program will not exceed the typical conditions that have prevailed in the European MOX program and for which there is substantial experience. These levels are about 5 percent total plutonium content (all isotopes), using reactor grade plutonium, which has about 60 percent plutonium-239, a far lower fraction than weapons grade plutonium (about 94 percent). This restriction is necessary for safety reasons, since the proportion of delayed neutrons upon which reactor control depends is much lower for plutonium-239 fission that for uranium-235 fission. The table below shows two examples of how the restriction of equivalent plutonium-239 content in the core reduces the percentage of weapons-grade plutonium that can be used in the MOX fuel of the disposition program. 2

	MOX Core loading fraction, %	Pu-total in MOX, %	Pu-239 core loading, %
Reactor grade MOX, France, typical	30	5.3	1.0
Weapons-grade MOX	30	3.4	1.0
Weapons-grade MOX	40	2.5	1.0

Note: Calculations are based on a plutonium-239 content of 60 percent for reactor-grade plutonium and 94 percent for weapons grade plutonium.

In the first example, for a 30 percent MOX fuel core loading in the disposition program, the weapons-grade plutonium content in MOX fuel would be restricted to 3.4 percent. For forty- percent core loading, it would be restricted to 2.5 percent plutonium. DOE should make these restrictions explicit in its Supplemental EIS. We note that although Electricite de France has asked for authorization to increase the total plutonium enrichment of reactor grade plutonium in MOX to about 7 percent, there is no substantial experience with this. This should not be used as the basis of the US disposition program. It would be contrary to repeated assurances that the US disposition program is based on extensive European experience.

4. The DOE should calculate the schedule and cost implications of the restrictions in the MOX loading and plutonium content as described above. It should specifically analyze at least the two examples in the table above. 3

5. The DOE should provide detailed safety justification for any increase in plutonium-239 content above one percent in the core (see table above). If the DOE's Record of Decision is to proceed with MOX (which IEER opposes), the DOE should require 4

FR004

FR004–2 **MOX RFP**

There is no NRC restriction or limit concerning the amount of plutonium 239 in the reactor core at this time. The DCS Team is proposing to accomplish DOE's plutonium disposition effort using a partial MOX core with approximately 4 percent plutonium 239. DOE recognizes that European MOX programs use different enrichment levels and reactor–grade plutonium. If any specific safety limits or restrictions on the proposed enrichment level are required, they would be identified by NRC during the license amendment process.

FR004–3 **MOX RFP**

DCS has proposed a partial MOX core with approximately 40 percent MOX fuel. As discussed in response FR004–2, there is no NRC restriction on plutonium 239 levels at this time. Since DOE does not anticipate NRC restrictions which would significantly affect the proposed plutonium 239 levels or proposed MOX loading, DOE has not evaluated the cost and schedule implications of the commentor's suggestion. Should significant changes in the proposed plutonium 239 content be required by NRC, DOE would conduct additional NEPA, cost, and schedule analysis, as appropriate.

FR004–4 **Facility Accidents**

This comment is addressed in response FR004–2.

reactor operators to seek explicit license approval on this specific issue, besides other licensing issues. The DOE should factor in increased risks of reactor accidents for increases in plutonium-239 content beyond the typical European experience. The DOE should also provide a detailed analysis of the various scenarios it is proposing for the plutonium-239 content in reactor cores in the US disposition program relative to the European experience. This analysis should include details on what steps the DOE and its contractors plan to take to address safety issues if the plutonium-239 content of the MOX cores in the disposition programs is greater than has been the case in typical European experience. 4

6. Getting a disposition program in place in Russia is a central reason that has repeatedly been put forward to justify the MOX program in the United States. The use of MOX in Russian light water reactors is likely to have some US funding, since Russia insists that it will not carry out such a program without external funding, MOX use in Russia will also have non-proliferation consequences for the United States, especially given that, unlike the United States, Russia plans at some time in the future to reprocess MOX spent fuel. Further, some of the radioactive fallout from a severe accident in a Russian reactor using MOX, should one occur, may affect the Untied States, as did the fallout from the Chernobyl. Therefore, the Supplemental EIS should analyze the environmental consequences of MOX use in Russia. 5

FR004

FR004–5 **Nonproliferation**

DOE acknowledges the commentor's concerns regarding the disposition of surplus Russian plutonium as MOX fuel, although programmatic and policy issues such as U.S. policies toward plutonium disposition in Russia are beyond the scope of this SPD EIS. The scope of this SPD EIS is focused on analysis of alternatives on whether and how much U.S. surplus plutonium should be used as MOX fuel, which technology should be used for immobilization, where to construct the proposed surplus plutonium disposition facilities that are needed, and where to perform lead assembly fabrication and testing.

Understanding the economic dilemma in Russia, the U.S. Congress has appropriated funding for a series of small-scale tests and demonstrations of plutonium disposition technologies jointly conducted by the United States and Russia. For fiscal year 1999 (starting October 1998), Congress further appropriated funding to assist Russia in design and construction of a plutonium conversion facility and a MOX fuel fabrication facility. This funding would not be expended until the presidents of both countries signed a new agreement. Although the amount appropriated by Congress is not sufficient to fund the entire Russian surplus plutonium disposition program, the United States is working with Russia and other nations to resolve this issue.

MARYLAND OFFICE OF PLANNING
LINDA C. JANEY
PAGE 1 OF 2

MARYLAND *Office of Planning*

Parris N. Glendening
Governor

Ronald M. Kreitner
Director

May 10, 1999

Ms. Laura S. H. Holgate
Director
Office of Fissile Materials Disposition
U.S. Department of Energy
P.O. Box 23786
Washington, DC 20026-3786

STATE CLEARINGHOUSE REVIEW - SPECIAL

State Application Identifier: MD990505-0416
Project Description: Draft Environmental Impact Statement - Supplement to the Surplus Plutonium Disposition (See MD980727-0797): an analysis of commercial reactor sites in 10 states that are proposed to irradiate mixed oxide fuel
State Clearinghouse Contact: Bob Rosenbush

Dear Ms. Holgate:

This is to acknowledge receipt of the referenced project. By copy of this letter, we are providing copies of the project to appropriate agencies, and requesting that they contact your agency directly with any comments or concerns by June 01,1999, and that they forward a completed response form and any comments to the Clearinghouse. 1

Please complete the attached form and return it to the State Clearinghouse upon receipt of notification that the project has been approved or not approved.

The State Application Identifier Number must be placed on all documents and correspondence regarding this project.

Please be assured that after June 01,1999 all intergovernmental review requirements will have been met in accordance with the Maryland Intergovernmental Review and Coordination Process (COMAR 14.24.04).

Sincerely,

Linda C. Janey

Linda C. Janey, J.D.
Manager, Clearinghouse & Plan Review Unit

LCJ:BR:mds
Enclosure
(* indicates with attachments)
cc: *MDE - Steve Bieber, *DHCD - Lucinder Jones, *MDSP - Carl Banaszewski, *DNR - Ray Dintaman, *MDOT - Ronald Spalding, *MEMA - Ruth Mascari, *OPC - Mary Abrams, *OPM - Bob Rosenbush

301 West Preston Street • Baltimore, Maryland 21201-2365
State Clearinghouse: (410) 767-4490 Fax: 767-4480

MR001

MR001–1 **General SPD EIS and NEPA Process**

The *Supplement to the SPD Draft EIS* describes the potential environmental impacts of using MOX fuel in the six reactors selected in three States: Catawba Nuclear Station Units 1 and 2 in South Carolina, McGuire Nuclear Station Units 1 and 2 in North Carolina, and North Anna Power Station Units 1 and 2 in Virginia. The *Supplement* also describes other program changes made since the SPD Draft EIS was published.

DOE acknowledges the State's receipt of the *Supplement* and entry into the Maryland Intergovernmental Review and Coordination Process. DOE will submit the form provided upon publication of the ROD.

MARYLAND *Office of Planning*

Parris N. Glendening
Governor

Ronald M. Kreitner
Director

MEMORANDUM

Please complete this form and return it to the State Clearinghouse upon receipt of notification that the project has been approved or not approved by the approving authority.

TO: **Maryland State Clearinghouse**
Maryland Office of Planning
301 West Preston Street
Room 1104
Baltimore, MD 21201-2365

DATE: ____________________
(Please fill in the date form completed)

FROM: ______________________________
(Name of person completing this form.)

PHONE: (____)____________
(Area Code & Phone number)

RE: **State Application Identifier:** MD990505-0416
Project Description: Draft Environmental Impact Statement - Supplement to the Surplus Plutonium Disposition (See MD980727-0797): an analysis of commercial reactor sites in 10 states that are proposed to irradiate mixed oxide fuel

PROJECT APPROVAL

This project/plan was:

☐ Approved ☐ Approved with Modification ☐ Disapproved

Name of Approving Authority:	Date Approved:

FUNDING APPROVAL

The funding (if applicable) has been approved for the period of

____________________, 199____ to ____________________, 199____ as follows:

Federal:	Local:	State:	Other:
$	$	$	$

OTHER

☐ Further comment or explanation is attached

301 West Preston Street • Baltimore, Maryland 21201-2365
State Clearinghouse: (410) 767-4490 Fax: 767-4480

OPCH-1F

MR001

MARYLAND SAFE ENERGY COALITION
ROBIN MILLS
PAGE 1 OF 12

Comment on Supplement to the Surplus Plutonium Disposition
Draft Environmental Impact Statement (DOE/EIS-0283-DS)

From: Robin Mills, Director of the Maryland Safe Energy Coalition
Mail: P.O.Box 33111, Baltimore, Maryland 21218
Phone: (410) 662-8483
Fax: (410) 235-5325
Residence: 1443 Gorsuch Ave., Baltimore, Maryland 21218
E-mail: rmills4@bcpl.net

To: Department of Energy, Office of Fissile Materials Disposition
c/o Supplement to the SPD EIS
P.O. Box 23786, Washington DC, 20026
Phone: 1-800-820-5156
Fax: 1-800-820-5156
E-mail: http://www.doe-md.com

Date: 28 June 1999

Dear Bureaucrats,

I request that the Supplement (DOE/EIS 0283-DS) be withdrawn and rewritten due to errors and omissions in the document which prevent the public from accurately assessing environmental risk. Details of those errors and omissions follow.

1. Earthquakes

The environmental synopsis section of the report, page 7, says "The frequency of an earthquake of this magnitude is estimated to be between 1 in 100,000 and 1 in 10,000,000 per year." No reference or supporting material is supplied to support this false claim. In fact, Charleston has suffered two devastating earthquakes since the city was founded in 1670. Charleston is approximately one hundred miles from the Svannah River site (SRS). Because both earthquakes occurred before modern methods for measurement were developed in 1903 or the Modified Mercalli Intensity Scale was developed (1931), the exact magnitude of these quakes is unknown. 1

1

MR012

MR012–1 **Facility Accidents**

The earthquake that damaged or destroyed the majority of structures in Charleston, South Carolina occurred on August 31, 1886, and measured 6.6 on the Richter scale. Sixty people lost their lives and property damage was estimated at 5 to 6 million dollars. Effects in the epicentral region included about 80 km (50 mi) of severely damaged railroad tracks and more than 1,300 km^2 (502 mi^2) of extensive cratering and fissuring. Structural damage was reported several hundred kilometers from Charleston (including central Alabama, central Ohio, eastern Kentucky, southern Virginia, and western West Virginia).

DOE Standards 1020-94, *Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities* (April 1994), and 1022-94, *Natural Phenomena Hazards Characterization Criteria* (Change 1, January 1996), discuss the need to assess construction design requirements against maximum historical earthquakes in a given region or in tectonically analogous regions. The proposed surplus plutonium disposition facilities would be designed against seismic loading associated with a return period of 2,000 years (Performance Category PC–3).

The commentor is incorrect in presuming an equivalence between earthquake magnitudes that may be considered historically significant and those that would collapse the proposed MOX facility. As discussed in Appendix K.1.5.1, Accident Scenario Consistency, the frequency of seismic-induced total building collapse is developed as a margin below the frequency of seismic event against which the facility would be designed and constructed. The design-basis performance goal is that occupant safety, continued operation, and hazard confinement is assured for earthquakes with an annual probability exceeding approximately $1.0\text{x}10^{-4}$ per year. The transition from this criteria to a condition of total facility collapse has been qualitatively estimated using expert judgement to span at least an order of magnitude in frequency, resulting in an upper-bound estimate of $1.0\text{x}10^{-5}$ per year for total facility collapse. Given the large uncertainties in seismic behavior at such high magnitudes, accommodation has been made for the reasonable possibility that the frequency of total collapse may be significantly lower, hence the $1.0\text{x}10^{-7}$ per year lower bound.

I offer two references. "Earthquakes" by George A. Eiby, 1980, LCCCN # 80-10786, by Publisher Van Nostrand Reinhold Co., New York City, page 166,

"Another part of the United States not usually considered liable to earthquakes is South Carolina, but Charleston was badly damaged in 1886. This shock was one of the first to be the subject of an extended geological report, and there are some excellent photographs." I add that on page 189 this book lists the earthquake as having occurred on August 31, 1886.

"Historic Charleston" by Shirley Abbott, 1988 published by Oxmoor House Inc., Birmingham, AL 35201, on page 17, says,

"Earthquakes have come with terrible regularity, the worst perhaps in 1812 and 1886;..." On page 9 this book lists the founding of Charleston as 1670.

Two major earthquakes in 329 years of recorded history in the area. This evidence seems to indicate what the risk of future earthquakes might be, an average of one major quake every 165 years. If the MOX facility is to operate for 25 years, then the risk should be 25 in 165 or about one chance in seven. The supplement states, "an earthquake of sufficient magnitude to collapse the MOX facility." No data or refence is supplied to support the contention that the risk is as stated, but the historical record indicates the frequency might be much higher than the supplement admits. 1

The supplements stated risk of 1/100,000 to 1/10 million per year should be stated in terms the public can understand, by multiplying by the estimated facility lifetime, 25 years (?). Thus, the risk stated could be as low as one in four thousand that the MOX facility will collapse from an earthquake.

The whole treatment of the risk from earthquakes in the supplement is inadequate, obscures the risk to the public, does not supply proof or refences for its ascertations, and must, in my opinion, be withdrawn and rewritten.

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The commentor is correct in stating that, for an assumed 25-year facility lifetime, the risk could be as high as 1 in 4,000 using the above factors. However, the MOX facility is projected to operate between 10 and 15 years. Therefore, the lifetime risk would be between 1in 6,666 and 1 in 1 million. Per DOE NEPA guidance, frequencies are reported on a per year basis because the duration of one year is the basis most commonly used for comparing accident frequencies.

2. Omissions in Core Inventory Isotopic Ratios

The table K-2, on page K-3 in the Facility Accidents Appendix contains errors or omissions which do not allow the public to correctly assess the risk the proposed action requests.

The table lists Curium 244 ratio at .94, which is incorrect. The table correctly lists higher core inventories for all the transuranic elements, Pu 239, 240, 241, Am 241, and Curium 242. This makes sense as MOX, starting at 4 atomic mass units larger than uranium 235 fuel, and having a larger capture cross section (Pu 239 capture cross section = 269 barns where Uranium 235 capture cross section = 99 barns) would tend to form more large transuranic isotopes in the core inventory. For Curium 244 to be less abundant in MOX fuel as compared to uranium fuel would defy the laws of probability. I add, that the supplement supplies no reference for where this table K-2 came from or how it was determined, thus adding to the illegitamacy of its information.

This table is very important to understanding the safety of MOX fuel, and omissions in this table do not allow a correct assessment. The quantity of delayed neutrons produced by plutonium is much lower than the quantity produced by uranium fuel. This dearth of delayed neutrons would be apparent to the public if the core inventory ratios were made available for delayed neutron precursors (those isotopes that produce delayed neutrons). The primary sources of delayed neutrons are the isotopes of Bromine 87, 88, 89, 90 and 91 and Iodine 137, 138, 139, 140 and 141. None of these isotopes is included in table K-2!. The DOE can not argue that the omission is due to the short half lives of these isotopes, because they list other isotopes of short half life, and these particular isotopes are crutial to reactor safety. Their omission invalidates the whole report in my opinion.

I even suggest that failure to include the Bromine isotopes might have been done on purpose because the results might throw the whole safety of the MOX program into jeopardy. 2

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MR012–2 **Facility Accidents**

The curium 244 inventories shown in Appendix K were extracted from the output for the ORNL Isotope Generation and Depletion Code (ORIGEN) cases. Because the rate of curium 244 production is strongly dependent on burnup, it has a higher inventory level in LEU assemblies that are left in the reactor for three cycles than MOX assemblies that are left in the reactor for a maximum of two cycles. As a result, at the end of a cycle the ratio of curium 244 in a 40 percent MOX core would be about 6 percent lower than the ratio of curium 244 in a LEU core because more of the LEU core would be made up of assemblies that have been used for three cycles (33 percent of the core versus 20 percent of the core for the proposed MOX core).

It is true that burnups of 40 GWD/t or more result in higher fission gas production than LEU fuel at the same burnup. However, this does not automatically result in higher doses from reactors operating with MOX fuel. MOX fuel assemblies are engineered to accommodate this additional gas. In the event of a leaker, the gas is released into the reactor coolant and scrubbed through a series of filters that capture nearly all of the radionuclides so that any impact on dose would be expected to be small. Appropriate MOX fuel burnup limits will be established in concert with the NRC following a thorough safety review. It should be noted that reactors in Belgium and Germany typically use MOX fuel to burnups between 45 and 50 GWD/t and that while current French burnup limits are lower than that, French burnup limits for LEU fuel are also lower than those for U.S. reactors.

This SPD EIS analyzes offsite consequences and risks in terms of LCFs and/or prompt fatalities. Previous studies have determined that certain radioisotopes are primary contributors to offsite consequences due to their effects on humans and the environment. These radioisotopes are included in Table K–27. Radioisotopes bromine 87 through bromine 91 and iodine 137 through iodine 141 are not included in Table K–27 because they are not significant contributors to offsite consequences. Bromine 87 through bromine 91 and iodine 137 through iodine 141 are delayed neutron precursors with half-lives of less than 1 minute. They were included along with the hundreds of other isotopes in the ORIGEN analysis done to support this SPD EIS.

I reference Chart of the Isotopes by Knolls Atomic Power Laboratory, 13th edition July 1983. This chart shows the relative abundance of isotopes of particular atomic weight resulting from both the fission of uranium 235 and plutonium 239. From that chart,

	U-235 fission prod.	Pu-239 fission prod.	ratio
Percent w 87 amu	2.56%	.99%	.38
Percent w 88 amu	3.63%	1.36%	.37
Percent w 89 amu	4.88%	1.71%	.35

Because the plutonium 239 atom is 4 atomic mass units (amu) larger than uranium 235, the average fission products are also larger. In fact, that smaller of the two usual fission products from plutonium 239 is on average 5 amu larger than the smaller of the two fission products from uranium 235 fission. This results in a much smaller production of bromine isotopes which produce delayed neutrons.

The Knolls Atomic Power Lab chart referenced above does not give the amount of Bromine delayed neutron precursors, but only gives the abundance of all isotopes of that particular weight. The failure of table K-2 is that a more accurate assessment of the reduction of delayed neutrons is made impossible by the exclusion of crutial information from the table. 2

Another omission from the table is of even more significance. Tritium production is excluded. And any assessment of total fission product gas production is also totally absent from the supplement. Page 11 of the Environmental Synopsis provided by the reactor owner and MOX vendors states that the annual dose to the public would be the same with LEU fuel and MOX fuel. I dispute that.

I reference Irradiation Behavior of UO_2/PuO_2 Fuel in Light Water Reactors by W. Goll, H.P. Fuchs, R. Manzel and F. Schlemmer appearing in Nuclear Technology, April 1993, page 29 and MOX Fuel Experience in French Power Plants by P. Blanpain, X. Thibault and M. Trotabas appearing in Proceedings of the

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Tritium is a significant contributor to offsite consequences. The MOX/LEU ratio for tritium was calculated to be 0.95. Since this value is lower for the MOX core than an LEU core, the current analysis is conservative with respect to tritium.

Xenon 135, the most important reactor poison, with a thermal absorption cross-section 60 times greater than samarium 149, is included in Table K–27. Samarium 149, a stable (nonradioactive) isotope, is not included because it is not a significant contributor to offsite consequences.

The assertion that "the radiation dose from normal operations to the surrounding population at the reactors is not expected to change" is supported by doses at the Electricité de France plants in France where the dose to the public has not increased since these plants started to use MOX fuel. While it is conventionally accepted that there are differences in fission product inventories and activation products between an LEU and MOX core during a fuel cycle, these differences would be small enough that essentially no dose differential could be observed to members of the public. It is necessary to recognize that even though the concentration of plutonium would be different in the two reactor cores during a given fuel cycle, the quantities of "key" radionuclides (i.e., radionuclides that typically account for the majority of public dose) released to the environment are expected to remain essentially the same; such radionuclides are: iodine 131, cobalt 60, cesium 137, and tritium.

NRC Regulatory Dose Limits to the Public (as established per 10 CFR 50, Appendix I) are based on derived annual values (e.g., 3 mrem/yr from liquid effluent); to show compliance with these values, the calculated reactor doses are presented in a parallel (i.e., annual) format. In support of this approach, site environmental effluent reports are also published on an annual basis and accordingly provide annual dose values associated with reactor operations.

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ROBIN MILLS
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1994 International Topic Meeting, Light Water Reactor Fuel Performance, page 718, both references which clearly point to a vastly greater fission product gas production from MOX fuel as compared to LEU fuel. If gas production is higher with MOX fuel, then the release of gas to the environment would also be higher, and thus the statement on page 11 of the vendor supplied information is incorrect and must be withdrawn and reassessed.

During the Chernobyl accident, the operators allowed reactor power to fall which increased the accumulation of reactor poisons. It was attempting to bring power back up, and overcome the poisons that caused the operators to withdraw control rods beyond design specifications, causing the accident. As such, it is of interest, with reguard to reactor safety and accidents, to know the production of reactor poisons produced by MOX fuel as compared to uranium fuel. The table K-2 again fails to inform the public of the true situation, especially by excluding Samarium production. The public is unable to assess the risk, or to even coment on the differences, because of this omission. 2

In summary to objection #2, the supplement fails to include:
Delayed neutron precursors production omitted
Fission product gas production, especially omitting Tritium
Fission product poison production omitted
Curium 244 production incorrectly stated
Source for the Core Inventory Isotopic Ratios info not stated.

3. MOX Accident Frequency Data

On page 33 of the supplement the statement is made that, "Although it has been suggested that the frequency of these accidents would be higher with MOX fuel present, no empirical data is available to support this." It is my contention that there is emirical data which DOE is overlooking, presenting a clear case of bias by the DOE officials. 3

I here list 12 specific aspects where MOX fuel lowers safety.

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MR012–3 **Facility Accidents**

The commentor makes a series of 12 statements that he uses to deduce that MOX fuel is less safe than LEU fuel. The specific comments are addressed as follows:

The commentor's first through fourth and seventh through tenth statements discuss physical parameters that are different between LEU and MOX fuels and/or plutonium 239 and uranium 235 nuclei. The stated differences are correct: MOX fuel melts at a slightly lower temperature than LEU; plutonium does not conduct heat as well as uranium; fission gas release from pellets to the plenum is greater for MOX than LEU, at least for higher burnups (beyond 35,000 MW-day/MTHM); control rod worths are reduced with MOX fuel; the moderator coefficients are different; the neutron spectra are different and the lifetimes differ; and MOX fuel decay power is greater than LEU fuel in the long term (i.e., well after reactor shutdown). All of these facts are known and are incorporated in nuclear design packages that have been used to design fuel for reactors that are operating in Europe.

The fifth statement relates to power peaking. Power peaking can be an issue in partial MOX cores because of the neutron flux gradient between LEU and MOX assemblies. As noted by the commentor, the peaking issues in partial MOX cores are resolved by increasing the enrichment of uranium 235 at the edge of LEU assemblies that are adjacent to MOX assemblies and by decreasing the plutonium concentration at the edge of MOX fuel assemblies that are adjacent to LEU assemblies. These changes mitigate the flux gradient that would otherwise exist between adjacent LEU and MOX assemblies. DCS has proposed using graded enrichment fuel for the MOX assemblies only. The enrichment will vary by fuel rod within an assembly, not within individual fuel rods. DOE does not agree that this solution introduces opportunity for errors that would lead to an increase in accident risk.

The sixth statement relates to the degree of mixing of plutonium and uranium in MOX fuel. Whereas LEU fuel is inherently homogeneous on a microscopic scale, MOX fuel is not. However, the degree of mixing that is required need only ensure that plutonium islands in the MOX fuel are sufficiently small that adequate heat rejection to the rest of the pellet may ensue. The Micronized

1.) Lower melting point.

The Plutonium Handbook, by O.J. Wick, editor, 1980 by the American Nuclear Society states on page 263, section (c)(1), "Melting Behavior. The melting point of UO_2 has been reported many times in the literature and values ranging from less than 2700 C to about 2825 C can be found. At Hanford a value of 2730 ± 30 C has been consistently observed for UO_2. Only four melting points have been reported for PuO_2 - 2240 C, 2295 C, 2280 C, and 2400 C."

This is empirical data showing plutonium oxide has a lower melting point as compared to uranium oxide. This lower melting point does have an effect on safety, as a meltdown will occur at lower temperatures with fuel containing plutonium. When mixed with UO_2, the melting point of the mixture should exhibit a melting point somewhere between the two elements, which means, the melting point of MOX fuel will always be lower than the melting point of LEU fuel. This is a reduction in safety margin, and there is adequate empirical data available to prove this point. 3

Furthermore, this lower melting point is impacted by other adverse safety features of MOX fuel, such as corrosion attack on the cladding by plutonium at high temperatures, increased fission product gas production and power peaking at the MOX fuel boundaries, which taken together greatly increase the risk of release of plutonium and fision products into the coolant.

2.) Lower heat conductivity.

The Reactor Handbook, section Plutonium and Its Alloys C.R. Tipton editor, Volume 1, 2nd edition by Interscience Pub., 1960, New York, pages 280-1 found that the thermal conductivity of plutonium-uranium alloys was somewhat lower than that found for pure uranium. If so, and there is other evidence available to support this ascertation, then the temperature inside the MOX fuel rods will be higher than in the LEU fuel rods, as the transfer of heat will be slower. In concert with the increase

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Master (MIMAS) fuel fabrication process assures a well-mixed inventory of plutonium and uranium on a scale that precludes islands of plutonium particles in the uranium matrix from exceeding established size limits. The mixing operations in the MIMAS process ensure adequate mixing of the oxides; in fact, the MIMAS process was developed commercially in Europe with exactly this issue in mind.

In relation to the eleventh statement, worker exposure will increase marginally as reported in this SPD EIS. The increased dose, which is small and still well within NRC requirements, would result from handling and inspecting the fresh MOX fuel assemblies which are inherently more radioactive than fresh LEU fuel assemblies.

As to the commentor's concern about reactor vessel embrittlement, analyses performed for DOE indicated that the core average fast flux in a partial MOX fuel core is comparable to (within 3 percent of) the core average fast flux for a uranium fuel core. All of the mission reactors have a comprehensive program of reactor vessel analysis and surveillance in place to ensure that NRC reactor vessel safety limits are not exceeded.

The twelfth statement is an attempt to roll the previous statements together and conclude MOX fuel is not safe. The commentor mistakes design constraints and challenges for using MOX fuel as indicators of inherent decrements in safety. All of the differences between the two fuel types can be accommodated by proper engineering without any significant decrement in safety. Rigorous safety analyses and operational parameter assessments would be conducted, and a license amendment approved by NRC, prior to the use of MOX fuel in any U.S. reactor.

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in fission product gas production, the creation of a gas gap between the fuel and cladding combined with lower heat conductivity leads to a much larger risk for localized fuel failure and melting.

3.) Higher fission gas production

Increased gas production threatens safety in at least three separate ways. The gas threatens the creation of a heat insulating gas gap between the fuel and cladding causing localized fuel melting, the gas creates pressure inside the fuel rods threatening cladding failure from bursting, and the gas threatens increased radioactive gas releases to the environment leading to an increase in local population exposures. The failure of DOE to admit to a doubling of Tritium production in MOX fuel, increased production of other gasses especially at higher burnups, and the threat this situation poses, should be a scandle.

The Plutonium Handbook (ibid) section on the Irradiation Behavior of UO_2-PuO_2 (section 20-3.2, pages 664-665) part (b) last sentence states, "All the irradiation specimens with the exception of two had a fission gas plenum to prevent excessive internal gas pressures at the high burnups." I quote this to point out that nuclear engineers have known about the fission gas production problem of plutonium fuels for a long time.

4.) Control Rods and Boron Worth Reduction

Both uranium and plutonium can either fission or absorb neutrons. The likelyhood that either will occur is expressed by the unit barns, which technically is 10^{-28} meters squared, or also 10^{-24} centimeters squared, or a cross sectional area measuring a trillionth of a centimeter squared. Both uranium and plutonium have cross sections for both fission and for capture. It turns out that plutonium is much more likely to absorb neutrons in the thermal energy region than uranium, or more precisely, the cross section for capture is 99 barns for uranium 235 and 269 barns for plutonium 239.

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Because plutonium absorbs so many thermal neutrons, the average energy (speed) of the remaining neutrons is higher (faster). The control rods are not as effective with faster neutrons, thus there is reduced control rod worth. There is also reduced boron worth. Boron is often added to the reactor water to help control the reactor. (called a shim) As a result, it has been decided to add additional control rods to reactors using MOX fuel.

A reduction in control rod effectiveness is empirically proveable and it definitely has an effect on reactor safety. This aspect is so important that it has already been decided to increase the number of control rods in MOX fueled reactors. The supplement should state that there is indeed a safety problem, and should state what exactly the DOE plans to do to reduce this safety hazard. It is my contention that even with additional control rods, the reduction of control rod and boron worth will make MOX fueled reactors inherently less safe.

5.) Power Peaking Problems

Due to intense absorbtion of thermal neutrons by plutonium, there is a tendency that an irregular power distribution results inside the core, producing a large power peak at the water-MOX fuel interface. This effect of Fick's Law can be stated that the rate of flow of the solute is proportional to the negative gradient of the solute concentration. In simply terms, because plutonium absorbs so many neutrons, there is a flow from uranium elements towards MOX elements (of neutrons) creating higher power levels around the MOX fuel elements.

I do not argue that this problem is unsolvable, but rather that solving this problem introduces a factor into the MOX fuel calculation which increases the risk of an accident. The solution is to create zones within each fuel rods which have differing grades of plutonium concentration to offset the power peaking problem. The complexity of this solution introduces the possibility of errors in fuel construction, labeling, shipping and loading.

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6.) Stoichiometry of MOX Fuel

The Plutonium Handbook (ibid) in the section on UO_2-PuO_2 fuels states on page 665, "Uniform solid solution assures a short heat transfer time constant so that the negative Doppler effect of U-238 can offset the positive effect of Pu-239." This is evidence that Pu-239 has a positive Doppler effect. The Doppler effect is the fuel temperature coefficient of reactivity, and is also sometimes called the prompt temperature coefficient. The Nuclear Regulatory Commission requires that the overall temperature coefficient be negative. The consequences of a positive coefficient are dire. If a coefficient is positive, then an increase in temperature causes an increase in reactivity which in turn increases temperature, producing a positive feedback loop that could cause rapid reactor dissassembly. By NRC requirements the combined temperature coefficients must be negative so that an increase in temperature causes a decrease in power thus limiting potentially dangerous transients.

The above evidence quoted is that Plutonium 239 has a positive Doppler coefficient. This can be compensated for by properly mixing the plutonium oxide with uranium 238 oxide. According to the literature, grains of plutonium larger than about ten microns will cause Doppler coefficient problems. The problem is, an increase in temperature leading to an increase in reactivity. This is a safety problem.

The problem is stated, the evidence is clear, there is a solution, but there is an increased risk that a batch of MOX fuel won't be properly mixed. The word stoichiometry refers to whether a solution is completely uniform in mixture. MOX fuel must be.

7.) Moderator Coefficient

Nuclear Reactor Engineering by S. Glasstone and A. Sesonske, 1994 Pub. by Chapman & Hall, says on page 280, section 5.103, "Hence, there will be a tendency for the initial negative contribution to df/dT (from uranium-235) to become positive (from plutonium-239)." In english that means trouble.

8.) Decay Heat

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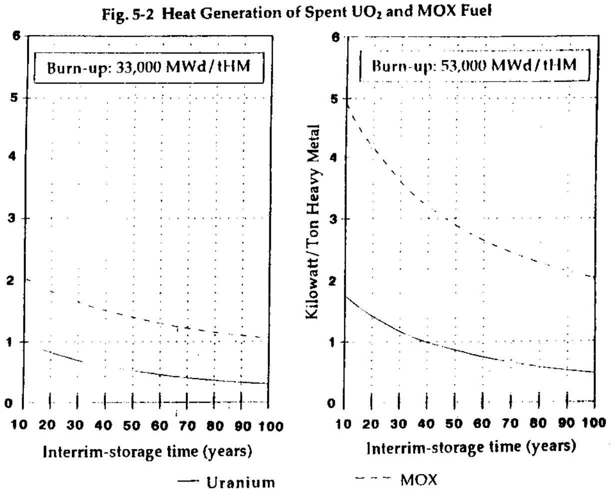
I reference the International MOX Assessment report entitled the Comprehensive Social Impact Assessment of MOX Use In Light Water Reactors by J. Takagi et.al., 1997 by Pub. Citizens Nuclear Information Center, Tokyo, Japan, page 190 shows the following table for decay heat generation is presented:

Fig. 5-2 Heat Generation of Spent UO_2 and MOX Fuel



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Higher heat generation means MOX fuel must be stored in the cooling ponds longer and will generate more heat in a repository. I add that higher fissile material concentrations in spent MOX fuel will also be higher creating a greater criticality danger.

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9.) Delayed Neutrons

Nuclear Reactor Engineering (ibid) page 110 puts the fraction delayed at Uranium 235 = .0065% versus plutonium 239 = .0020%. Uranium fission produces over three times as many delayed neutrons. Delayed neutrons control the reactor period, the speed with which changes in power can be made. A reactor with only prompt neutrons could not be controlled the reactor period would be too short, a matter of milliseconds. The reduction from MOX fuel causes the DOE and other countries to rely on only one third MOX reactor cores. Thus, there has already been some concession that this is a problem.

The reduction of delayed neutrons means that one third MOX cores will always have fewer delayed neutrons, by several percent. This difference is not explored in any way in the supplement and this difference would tend to make the distance to an accident closer.

10.) Prompt Neutron Lifetime

The faster neutrons in MOX fuel already explained in #4.) have another effect. The average time it takes for a neutron to be emitted until it is absorbed or causes fission is the prompt neutron lifetime, typically about 24 millionths of a second for uranium fuel. The omission of the reduced safety margin from a shorter neutron lifetime should be included in the supplement.

I say the increase in generations per second will be from about 41,000 generations per second of prompt neutrons to 49,000 generations per second for MOX fuel, an estimated 18% increase in generations per second. This will decrease reaction times slightly during transients, thereby decreasing the safety margin to an accident.

11.) Embrittlement and Exposures

Faster neutrons travel through more shielding. The supplement fails to account for the increased exposure to workers and increases in neutron embrittlement to reactor components.

12.) The Synergy Effect

Just one of the preceeding problems might not cause an accident, or significantly increase "the frequency of these accidents", but together:

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<u>Summary of the ways MOX fuel is less safe in reactors</u>

1. Plutonium has a lower melting point.
2. Plutonium does not conduct heat as well.
3. Fission product gas production is higher.
4. Control rod and boron worth is reduced.
5. Power peaking is more difficult to control.
6. Mixture of the fuel must be perfect.
7. The much different moderator coefficient is troublesome.
8. Decay heat production complicates shutdowns and disposal.
9. Delayed neutron reduction reduces safety margin.
10. More prompt neutron lifetimes reduces the safety margin.
11. Worker exposure increases and reactor embrittlement increase.
12. Taken together there is a preponderance of evidence that MOX fuel might not be as safe as uranium fuel.

I therefore challenge the catagorical statement made on page 33 of the supplement that, "there is no empirical data available to support this." I have presented several expert sources of the subject to show that there are concerns about these problems among experts. 3

One aspect of the plutonium disposition process that can not be brought before experts is superstition, the thirteenth reason MOX is less safe. Plutonium is named after the god of the underworld Pluto, an object of fear and death. I fear that the greed of the nuclear industry will cause a huge catastrophe if they proceed. Mixing profit motive with plutonium <u>is</u> unlucky. I'm not afraid to use any arguement that happens to favor my position.

To summarize my main points about the supplement, the risk of earthquakes is lacking, the table of fission product ratios is lacking, and the catagorical statement about accident frequency needs to be reexamined.

Robin Mills

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MILLS, ROBIN
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Question/ Information Request Card

Name: ROBIN MILLS
Address: 1443 GORSUCH AVE.
B-MORE, MD 21218
Phone: (410) 662-8483 Fax: (410) 235-5325
E-mail: rmills4@bcpl.net

Question/ Request: Charleston, S.C. was destroyed by earthquake in 18??. Please provide info. on date, strength, damage and est. frequency of S.C. earthquakes. 1

For further information contact:
U.S. Department of Energy, Office of Fissile Materials Disposition, MD-4
Forrestal Building, 1000 Independence Ave., SW, Washington, D.C. 20585
1-800-820-5156

DCR002

DCR002–1 **Geology and Soils**

The earthquake that damaged or destroyed the majority of structures in Charleston, South Carolina occurred on August 31, 1886, and measured 6.6 on the Richter scale. Sixty people lost their lives and property damage was estimated at 5 to 6 million dollars. Effects in the epicentral region included about 80 km (50 mi) of severely damaged railroad tracks and more than 1,300 km^2 (502 mi^2) of extensive cratering and fissuring. Structural damage was reported several hundred kilometers from Charleston (including central Alabama, central Ohio, eastern Kentucky, southern Virginia, and western West Virginia).

DOE Standards 1020-94, *Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities* (April 1994), and 1022-94, *Natural Phenomena Hazards Characterization Criteria* (Change 1, January 1996), discuss the need to assess construction design requirements against maximum historical earthquakes in a given region or in tectonically analogous regions. The proposed surplus plutonium disposition facilities would be designed against seismic loading associated with a return period of 2,000 years (Performance Category PC–3). In addition, there is a deterministic element to the process which also requires evaluation against maximum historical events. Other new facilities at SRS have been assessed against the Charleston earthquake for design adequacy and the proposed facilities at SRS would undergo the same assessment.

MILLS, ROBIN
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Question/ Information Request Card

Name: ROBIN MILLS

Address: 1443 GORSUCH AVE

BALTIMORE, MD. 21218

Phone: (410)662-8483 Fax: (410)235-5325

E-mail: rmills4@bcpl.net

Question/ Request: Fuel temperature coefficient of reactivity response curve for Pu 239 versus U-235 fuels. This is my 2nd request for this info. 1

For further information contact:
U.S. Department of Energy, Office of Fissile Materials Disposition, MD-4
Forrestal Building, 1000 Independence Ave., SW, Washington, D.C. 20585
1-800-820-5156

DCR001

DCR001–1 **MOX Approach**

Initial evaluations indicate that partial MOX fuel cores have a more negative fuel Doppler coefficient at hot zero power and hot full power, relative to LEU fuel cores for all times during the full cycle. These evaluations also indicate that partial MOX cores have a more negative moderator coefficient at hot zero power and hot full power, relative to LEU fuel cores for all times during the full cycle. These more negative temperature coefficients would act to shut the reactor down more rapidly during a heatup transient.

STEVENS, BARBARA
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Public Statement:) BARBARA STEVENS + P.O. BOX 815
46 A Ridge Rd Chimayo, NM 87522
Greenbelt MD 20770

(1) One of the reactors that would use MOX is close to Washington DC area

I am concerned that this is a complete experiment. Bomb plutonium has never been used for reactor fuel before.
I am not willing to take the risk. 1

~~MOX~~ mat are making MOX fuel would result in more process waste that would likely go to WIPP, immobilization could make less process waste than MOX.
I live part of the year in New Mexico where I am a property owner. I oppose WIPP + I oppose all new plutonium waste generation. 2

page 1 of 3
Barbara Stevens
June 15, 1999

DCR006

DCR006–1 **MOX Approach**

The fabrication of MOX fuel and its use in commercial reactors has been accomplished in Western Europe. This experience would be used for disposition of the U.S. surplus plutonium. The environmental, safety and health consequences of the MOX approach at the proposed reactors are addressed in Section 4.28. In addition, NRC would evaluate license applications and monitor the operations of both the MOX facility and domestic, commercial reactors selected to use MOX fuel, to ensure adequate margins of safety.

DCR006–2 **Waste Management**

DOE acknowledges the commentor's opposition to WIPP and all generation of new plutonium waste. Only TRU wastes generated by the proposed surplus plutonium disposition facilities would be shipped to WIPP. DOE alternatives for TRU waste management are evaluated in the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997) and the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). As described in Appendix F.8.1, and the Waste Management sections of Chapter 4, it is conservatively assumed that TRU waste would be stored at the candidate sites until 2016, at which time it would be shipped to WIPP in accordance with DOE's plans.

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being

(2)

AN OBSERVATION: that touches on the Impact statement — in a obscure but perhaps real Way — MOX → Extra WASTEs —

Just when WIPP was opened (last month) Sychronized with its opening — a LARGE AD Campaign blossomed for the Nuclear Power Industry.

AT The Time WIPP opened (illegally - Some think) There was a NM State Permit - Hearing to open WIPP - was underway AND has Not yet been Completed - GAO ~~is~~ ~~still~~ has yet to reviewing - it As we speak.

At That Hearing - The undisputed INFORMATION That the Radioactivity going into WIPP - Will At some point surface in the Pecos River, Rio GRANDE + Gulf of Mexico.

THEREFORE: TO - TAKE the MOX solution - produce more radiative waste ~~than necessary~~ IN ORDER to dispose of the surplus Plutonium THAN absolutely Necessary - (SINCE the waste can Not Actually be contained) - and to do this to ~~further~~ IN fact Just give a boon to the Nuclear power Industry - and further mask its True cost - ~~IS~~ MAKES MOX unacceptable to anyone ~~interested~~ CONCERNED with the ENVIRONMENT. 3

Thank you; Barbara Stevens June 15/99

DCR006

characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository. The immobilized plutonium and MOX spent fuel are included in the inventory analyzed in that draft EIS.

DCR006–3 **Waste Management**

DOE acknowledges the commentor's concern regarding contamination of water resources in the vicinity of WIPP, although this issue is beyond the scope of this SPD EIS.

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

The remainder of this comment is addressed in response DCR006–2.

STEVENS, BARBARA
PAGE 3 OF 3

Thankyou for considering
my Comments & the Questions
they raise ~~[illegible]~~
Barbara Stevens
June 15, 199

DCR006

ACTION SITE TO STOP CASSINI EARTH FLYBY
JONATHAN MARK
PAGE 1 OF 1

1. MOX is a bad idea 1
2. DOE should hold hearings in all affected communities – especially those near the chosen sites.
PSR, along with many environmental and non-proliferation groups, supports the immobilization option and oppose the MOX option. For more see PSR's web site at: http://www.psr.org/cleanuppage.htm 2

WR002

WR002–1 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

WR002–2 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's request for public hearings in all communities affected by the use of MOX fuel, especially those near the proposed reactor sites. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina. Moreover, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process should the MOX approach be pursued per the SPD EIS ROD.

DOE acknowledges the commentor's support of the immobilization-only approach. As discussed in response WR002–1, DOE has identified as its preferred alternative the hybrid approach.

CHARTER TOWNSHIP OF CHINA

4560 Indian Trail
China Township, Michigan 48054
(810) 765-1145
FAX 765-4080

June 28, 1999

United States Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, D.C. 20026-3786

RE: SURPLUS PLUTONIUM DISPOSITION ENVIRONMENTAL IMPACT STATEMENT

Dear Sirs:

Let me first introduce myself. I am Supervisor of China Charter Township, St. Clair County, China, MI. Representative David Bonior has been on the forefront of this very pressing issue as it could impact our Great Lakes area. Our fresh water lakes are a God-given gift, something to be protected and preserved.

There is no way we ever want to see plutonium coming through this area, passing over the Blue Water Bridge into Canada, or any other route, be it railway tunnel, etc. The danger is too great to take a chance that some disaster might occur. I ask, on behalf of my constituents, as well as all those living in our great state, but even more far reaching than that; I ask, for all those people across our great nation who visit our state to see all of its natural beauty, but more importantly, for those who rely on this fresh-water source. 1

Hear my plea and act accordingly. For this I shall be truly grateful.

Sincerely,
Linda J. Schweihofer
Linda J. Schweihofer
China Charter Township Supervisor

cc/ Representative David Bonior
Troy Feltman, St. Clair County Administrator
Lauren Hager, Representative

FR007

FR007–1 **Parallex EA**

Shipments of a small quantity of MOX fuel from LANL to Canada were part of a separate proposed action. DOE has prepared an *Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment* (DOE/EA-1216, January 1999) and FONSI, signed August 13, 1999, on fabrication of the MOX fuel and its transportation to Canada. Because the Blue Water Bridge in Port Huron, Michigan, will be under renovation during the time of the proposed shipment, the route using that bridge was removed from consideration. This EA and FONSI can be viewed on the MD Web site at http://www.doe-md.com.

CITIZENS FOR ALTERNATIVES TO CHEMICAL CONTAMINATION
KAY CUMBOW
PAGE 1 OF 2

Comments on the Suppement to the Surplus Plutonium Disposition Draft Enviornmental EImpact Statement (DOE/EIS-0283-DS)

To the DOE,

At the very least, the EIS should not be finalized UNTIL hearings are held in the communities close to the reactors that will be using MOX in the U.S.. It is unbelievable that the DOE would refuse to hold hearings in the communities that would be most affected. 1

I am strongly opposed to the use of MOX in reactors, as it does nothing to stop the production of plutonium. It will be used as fuel to PRODUCE MORE plutonium. It also will end any pretense the U.S. has had for stopping the global proliferation of bomb-grade materials. It is also being done without the knowlege of most taxpayers in this country. We after all are the ones who will pay for clean-up, for additional cancers and leukemias, for an increased arms race, for the heightened spread of nuclear power throughout an ecologically fragile world. We are the ones who will be left with poisoned groundwater, and soils, as well as having to dedicate not only our time and money but that of forseeable future generations to guarding the end "products" and endlessly repackacking them, when they leak (if that is indeed possible) lest all of the Earth's waters and soils and air become a toxic ruin.

The International Joint Commission of the Great Lakes has stated that there are some substances that are so toxic they should not be produced in the Great Lakes. They call those substances persistant toxins. Plutonium easily meets the criteria - toxic substances with a half-life of 8 weeks in water, that bioaccumulate. Plutonium also becomes 1,500 times more soluble to the human body if mixed with chlorine, according to Water Fit to Drink, a book found in most libraries in the state of Michigan. The International Joint Commission stated that the U.S. and Canadian governements should begin phase-out of radioactive substances that fit this criteria, and they add that plutonium is indeed a radionuclide of concern. The U.S. DOE should heed these words from the International Joint Commission. It is one world. Toxins move by air, by water, through the soil. We should not use plutonium to make more plutonium, when there is no safe way to dispose of it, and when using it subjects workers to its possible toxicity. What a legacy we leave for the generations to come! 2

What is worse is that this is done without taxpayers knowlege of the true costs, and with making a sham of democratic process. To deny hearings to residents around the three nuclear plants that would use MOX in the U.S. is a travesty of justice. To award contracts for production of MOX and irradiation of MOX fuel before the EIS is finalized and a record of decision is made, shows clearly that the DOE has rendered the NEPA process meaningless - that they are just going through the motions, and they do not even respect the taxpayers enough to go through all of them. 1

---- Kay Cumbow
Board Member, Citizens For Alternatives to Chemical Contamination
Co-Founder, Citizens For a Healthy Planet

My address is 15184 Dudley Road, Brown City MI, 48416

I will send a written copy, signed in the mail.

WR010

WR010–1 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's view that DOE has refused to hold public hearings in the communities of the potential reactor sites that would use the MOX fuel. During the 45-day public comment period on the *Supplement to the SPD Draft EIS*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement*. DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina. Moreover, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process should the MOX approach be pursued per the SPD EIS ROD.

As stipulated in DOE's phased contract with DCS, until and depending on the decisions regarding facility siting and approach to surplus plutonium disposition are made and announced in the SPD EIS ROD, no substantive design work or construction can be started by DCS on the MOX facility. Should DOE decide to pursue the No Action Alternative or the immobilization-only approach, the contract with DCS would end. The contract is phased so that only nonsite-specific base contract studies and plans can be completed before the ROD is issued, and options that would allow construction and other work would be exercised by DOE if, and only if, the decision is made to pursue the MOX approach.

WR010–2 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. To this end, surplus plutonium would be subject to stringent control, and the MOX facility

CITIZENS FOR ALTERNATIVES TO CHEMICAL CONTAMINATION
KAY CUMBOW
PAGE 2 OF 2

would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

The environmental, safety and health consequences of the MOX approach in the proposed reactors are addressed in Section 4.28. Analyses in Chapter 4 of Volume I for construction and normal operation of the proposed surplus plutonium disposition facilities at the DOE candidate sites indicate there would be no discernible contamination to drinking water, either from the deposition of minute quantities of airborne contaminants into small water bodies or from potential wastewater releases. Therefore, it is estimated that no measurable component of the public dose would be attributable to liquid pathways. Further, because the candidate sites are located in Idaho, South Carolina, Texas, and Washington, the chances of the Great Lakes being affected are remote.

NUCLEAR-FREE GREAT LAKES ACTION CAMP
KEVIN KAMPS
PAGE 1 OF 2

Monday, June 14, 1999

Dear U.S. D.O.E. officials,

People in the Great Lakes region – in the U.S. and Canada – are very opposed to the use of weapons plutonium in commercial reactors. For years, citizens on both sides of the border have rallied together to stop even the Los Alamos to Chalk River test shipment of MOX from passing through our region. This should have served loud notice of our strong opposition to the entire proposed MOX program. Such citizen pressure has moved politicians at all levels of government – from county commissions to a U.S. Senator – and from different parties (from Democratic U.S. Representatives to Republican Governors) to take stands against the test shipment as well.

From this international, grassroots network-building has sprung the Nuclear-Free Great Lakes Action Camp, taking place this August on the Lake Michigan shoreline in southwest Michigan. Concerned citizens groups from Minnesota, Wisconsin, Illinois, Indiana, Michigan, Ohio, and Ontario have joined forces to organize this week-long event. Hundreds from throughout the region and across the country will attend, representing the environmental, peace, justice, human rights, and indigenous peoples movements, scientists, and government officials who recognize that MOX is a significant concern to their constituencies. People who have struggled for abolition of nuclear weapons will join with opponents of nuclear power to present a unified front against the proposed MOX program.

Preventing MOX fuel from being transported through or used anywhere in the Great Lakes basin – such as at the Bruce reactors in Ontario on northern Lake Huron – is a top goal of the Action Camp. Representatives from the Institute for Energy and Environmental Research and Nuclear Information and Resource Service in the U.S., and from the Canadian Coalition for Nuclear Responsibility and the Nuclear Awareness Project in Canada, will lead the discussion among the concerned citizens gathered from both countries. Out of that democratic process, a strong opposition to MOX will emerge. Participants will return home to their communities in the U.S. and Canada educated about the many dangers of MOX, and equipped with training to launch campaigns against MOX in their own areas. 1

The Great Lakes resistance to MOX is networked with resistance in other regions of the U.S. and Canada, as well as with Russia and other countries overseas. This grassroots movement is building.

Our network will reunite in September, 1999, at the International Joint Commission biannual meeting in Milwaukee, Wisconsin. Our international coalition will commend the IJC for listing radionuclides as persistent toxins for which ***zero discharge*** into the Great Lakes should be allowed. MOX could lead to a higher risk of a catastrophic nuclear disaster, for the reactors are aged and were never designed for its use. Such a catastrophe would be significantly worse than before, for the MOX would contain so much plutonium. Then there are the dangers of transporting MOX to reactors, and storage at or transport away from the reactors of the high-level wastes containing larger quantities of plutonium. For these reasons and others, we will urge the IJC to oppose MOX, for MOX threatens the Great Lakes, which the IJC is mandated to protect.

So aptly named for the God of the Dead, plutonium is one of the most carcinogenic poisons known, and can of course yield the ultimate weapons of mass destruction. Thus, it must be isolated from the biosphere and safeguarded from reuse in weapons, not unleashed in vast quantities onto the roads and rails, and scattered across the continent in reactors and processing plants. To save time, to save money – and, so much more importantly – to protect the environment and public health, and to genuinely safeguard against nuclear weapons proliferation, immobilization of surplus weapons plutonium and isolation from the living environment is the way to go, not the misdirected MOX proposal. The Great Lakes are a precious source of life to tens of millions of people and countless other forms of life. Concerned citizens organizations in the U.S. and Canada stand ready to protect the Great Lakes basin from the grave threats posed by MOX.

Sincerely, Kevin Kamps

Kevin Kamps
Southwest Michigan organizer
Nuclear-Free Great Lakes Action Camp
P.O. Box 50814
Kalamazoo, MI 49005

P.S. Why are you not holding hearings in our region, where we are so concerned and would be so significantly impacted by the use of MOX at the Bruce Reactors on Lake Huron? Plutonium decisions should not be plutocratic! 2

DCR015

DCR015–1 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

The transportation of weapons-usable fissile materials through Michigan is beyond the scope of the proposed action analyzed in this SPD EIS. Shipments of a small quantity of MOX fuel from LANL to Canada were part of a separate proposed action. DOE has prepared an *Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment* (DOE/EA-1216, January 1999) and FONSI, signed August 13, 1999, on fabrication of the MOX fuel and its transportation to Canada. This EA and FONSI can be viewed on the MD Web site at http://www.doe-md.com.

The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program. Furthermore, although no U.S. commercial reactors are licensed to use plutonium-based fuel, several are designed to use MOX fuel, and others can easily and safely accommodate a partial MOX core.

The environmental, safety and health consequences of the MOX approach at the proposed reactors are addressed in Section 4.28. In addition, NRC would evaluate license applications and monitor the operations of both the MOX facility and domestic, commercial reactors selected to use MOX fuel, to ensure adequate margins of safety.

DCR015–2 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's request regarding public hearings in the Michigan region. The irradiation of MOX fuel as discussed in the *Supplement to the SPD Draft EIS* involves proposed reactors located in

North Carolina, South Carolina, and Virginia, and not the use of the Canadian Bruce reactors. DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement*. DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site.

In the *Storage and Disposition PEIS* ROD, DOE retained the option to use some of the surplus plutonium as MOX fuel in reactors (e.g., the Bruce reactors), which would have only been undertaken in the event that a multilateral agreement were negotiated among Russia, Canada, and the United States. Since the SPD Draft EIS was issued, DOE determined that adequate reactor capacity is available in the United States to disposition the portion of the U.S. surplus plutonium that is suitable for MOX fuel and, therefore, while still reserving the CANDU option, DOE is not actively pursuing it. However, DOE, in cooperation with Canada and Russia, proposes to participate in a test and demonstration program using U.S. and Russian MOX fuel in a Canadian test reactor. This action is addressed in the *Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment* (DOE/EA-1216, January 1999) and FONSI, signed August 13, 1999. If Russia and Canada agree to disposition Russian surplus plutonium in CANDU reactors in order to augment Russia's disposition capability, shipments of the Russian MOX fuel would take place directly between Russia and Canada.

PORT HURON
HONORABLE STEVEN G. MILLER
PAGE 1 OF 2

OFFICE OF THE MAYOR

CITY OF PORT HURON
100 MCMORRAN BOULEVARD, PORT HURON, MICHIGAN 48060
PHONE: 810-984-9740; FAX: 810-982-0282

1999-006595 MAY 3P 4:12

April 29, 1999

Fredrico Pena, Secretary
Department of Energy
1000 Independence Avenue SW
Washington, D.C. 20585

Dear Mr. Pena:

I have enclosed Resolution #9 adopted by the City Council of the City of Port Huron, in opposition to the transportation and use of warhead plutonium throughout the Great Lakes Basin.

Please ensure this resolution of forwarded to the appropriate department so that our objection is officially noted.

Sincerely,

Steven G. Miller

Steven G. Miller
Mayor

SGM/rch

MR002

PORT HURON
HONORABLE STEVEN G. MILLER
PAGE 2 OF 2

Resolution #9
April 26, 1999

Councilmember Sample-Wynn offered and moved the adoption of the following resolution:

WHEREAS, the United States Department of Energy has developed a plan to "dispose" of a large portion of the Soviet and U. S. stockpile of fissile materials (weapons-grade plutonium and highly enriched uranium) and, in particular, by producing MOX which is weapons grade plutonium mixed with uranium oxide; and

WHEREAS, the Department of Energy, along with Russia, plans to transport and test MOX at Chalk River, Canada, with the eventual plan to transport much larger amounts for many years for use in CANDU reactors, including the Bruce reactors on Lake Huron; and

WHEREAS, the Great Lakes Basin contains one-fifth of the world's fresh water and 95% of the United States' fresh water, provides drinking water to 40 million residents, provides a safe place to live, work and recreate, and provides a home to diverse and unique wildlife and plants; and

WHEREAS, the unplanned release of plutonium as a result of a traffic or shipping accident or terrorist attack could have considerable consequences to the Great Lakes Basin; and 1

WHEREAS, due to a public outcry in 1998, the Blue Water Bridge was successfully removed from the proposed MOX test routes;

NOW, THEREFORE, BE IT RESOLVED that the Port Huron City Council opposes any and all tests in the Great Lakes Basin of Russian and U. S. warhead plutonium converted to MOX that are planned by the United States Department of Energy; and

BE IT FURTHER RESOLVED that the Port Huron City Council opposes the transportation and use of warhead plutonium converted to MOX throughout the Great Lakes Basin; and

BE IT FURTHER RESOLVED that a copy of this resolution be forwarded to the United States Department of Energy Office of Fissile Materials Disposition and each of our appropriate federal and state elected officials.

ADOPTED/~~REJECTED~~ UNANIMOUSLY

I hereby certify that the above is a true and correct copy of a resolution adopted by the Port Huron City Council at its regular meeting of April 26, 1999.

Pauline M. Repp, CMC/AAE
City Clerk

MR002

MR002–1 **MOX Approach**

DOE acknowledges the commentors' opposition to the transportation and use of weapons-usable plutonium in MOX fuel. In the *Storage and Disposition PEIS* ROD, DOE retained the option to use some of the surplus plutonium as MOX fuel in CANDU reactors, which would have only been undertaken in the event that a multilateral agreement were negotiated among Russia, Canada, and the United States. Since the SPD Draft EIS was issued, DOE determined that adequate reactor capacity is available in the United States to disposition the portion of the U.S. surplus plutonium that is suitable for MOX fuel and, therefore, while still reserving the CANDU option, DOE is not actively pursuing it. However, DOE, in cooperation with Canada and Russia, proposes to participate in a test and demonstration program using U.S. and Russian MOX fuel in a Canadian test reactor. This action is addressed in the *Environmental Assessment for the Parallex Project Fuel Manufacture and Shipment* (DOE/EA-1216, January 1999) and FONSI, signed August 13, 1999. If Russia and Canada agree to disposition Russian surplus plutonium in CANDU reactors in order to augment Russia's disposition capability, shipments of the Russian MOX fuel would take place directly between Russia and Canada.

I am alarmed at the idea of using surplus weapons plutonium in fuel for nuclear reactors (known as mixed-oxide or MOX fuel). A better method of disposition would be to immobilize the plutonium – that is, to mix it with ceramic or glass and to provide a radioactive barrier to further prevent theft and diversion. This would solve some problems without as many safety risks. 1

It is not demonstrably safe to use MOX fuel in existing reactors, almost none of which are designed to run on plutonium fuel. According to a study released by the Nuclear Control Institute in January, the use of a one-third core of warhead plutonium fuel in U.S. nuclear reactors could result in up to a 37% increase in cancer risk to the public in the event of a severe accident. That is irresponsible and unacceptable, and furthermore, no citizen especially wants the government to give him cancer. 2

In addition, it is unconscionable to implement such a program without involving the public on more than the present superficial level. 3

Minatom officials claim that plutonium is a valuable energy resource. Yet by their own estimates, plutonium-based nuclear energy will be more expensive than uranium-based nuclear energy for at least several decades. US officials say that MOX is not being pursued for its energy value but rather that it has been chosen to facilitate quick disposition of plutonium in Russia. However, immobilization is likely to be a much faster and cheaper method of plutonium disposition than MOX. 4

WR007

WR007–1 **Alternatives**

DOE acknowledges the commentor's opposition to the use of surplus weapons-grade plutonium in MOX fuel and irradiating it in nuclear reactors. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

DOE does not agree that the MOX approach is inherently more dangerous than the immobilization approach. DOE and NAS have conducted studies to compare risks, including the nuclear material security and proliferation risks of alternatives analyzed in this SPD EIS. These studies include the *Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Excess Plutonium Disposition Alternatives* (DOE/NN-0007, January 1997), *Proliferation Vulnerability Red Team Report* (SAND97-8203, October 1996), *Management and Disposition of Excess Weapons Plutonium* (NAS, 1994), and *Management and Disposition of Excess Weapons Plutonium, Reactor-Related Options* (NAS, 1995). As discussed in Section 4.28.2.5, studies by NAS have led it to the following conclusion: "no important overall adverse impact of MOX use on the accident probabilities of the LWRs involved will occur; if there are adequate reactivity and thermal margins in the fuel, as licensing review should ensure, the main remaining determinants of accident probabilities will involve factors not related to fuel composition and hence unaffected by the use of MOX rather than LEU fuel."

The environmental, safety and health consequences of the MOX approach at the proposed reactors are addressed in Section 4.28. In addition, NRC would evaluate license applications and monitor the operations of both the MOX facility and domestic, commercial reactors selected to use MOX fuel, to ensure adequate margins of safety.

WR007–2 **Facility Accidents**

While it is understood that there are differences from the use of MOX fuel versus LEU fuel, these differences are not expected to result in substantial changes in the frequency of severe accidents in MOX-fueled reactors. Because differences between MOX fuel and uranium fuel are well characterized, they can be accommodated through fuel and core design. The fabrication of MOX fuel and its use in commercial reactors has been accomplished in Western Europe. This experience would be used for disposition of the U.S. surplus plutonium. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by the reactor plant operators as part of their license amendment applications.

This SPD EIS analyzed several reactor accidents, including both design basis and beyond-design-basis accidents. For MOX fuel, as compared to LEU fuel, there is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

WR007–3 **General SPD EIS and NEPA Process**

The SPD Final EIS was not issued until specific reactors had been identified and the public had an opportunity to comment on the reactor-specific information. As part of the procurement process, bidders were asked to provide environmental information to support their proposals. This information was analyzed in an Environmental Critique prepared for the DOE source selection board prior to award of the MOX fuel fabrication and irradiation services contract. DOE then prepared an Environmental Synopsis on the basis of the Environmental Critique, which was released to the public as Appendix P of the *Supplement to the SPD Draft EIS* in April 1999. This *Supplement* included a description of the affected environment around the three proposed reactor sites, and analyses of the potential environmental impacts of operating these reactors using MOX fuel (Sections 3.7 and 4.28 of this SPD EIS, respectively). During the 45-day period for public comment on the *Supplement*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. For those interested parties who could not attend the hearing, DOE provided various other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process should the MOX approach be pursued per the SPD EIS ROD.

WR007–4 **Cost**

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com. These documents, as well as data reports and documents used in the preparation of this EIS, are available in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

Operation of the proposed surplus plutonium disposition facilities is expected to take approximately the same amount of time for either the immobilization-only approach or the hybrid approach. The difference in timing for the hybrid approach is associated with the amount of time that MOX fuel would be irradiated in domestic, commercial reactors.

As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach, which includes both immobilization and MOX fuel, would be more expensive than the immobilization-only approach. However, pursuing the hybrid approach provides the United States important insurance against potential disadvantages of implementing either approach by itself as discussed in response WR007–1.

Fresh MOX fuel in commerce presents a proliferation threat as the plutonium in it can be removed and used for weapons purposes. A 1997 DOE non-proliferation assessment of plutonium disposition found "that fresh MOX fuel remains a material in the most sensitive safeguards category, because plutonium suitable for use in weapons could be separated from it relatively quickly and easily." 5

Instead of solving the problem of placing plutonium into safe and secure forms, a MOX program is likely to promote further plutonium processing and use, something that is undesirable on environmental, safety, economic, and non-proliferation grounds. 6

Plutonium disposition programs must include significant and meaningful public input, including access to all information, including costs and operating records of the various actors involved in a disposition program. The public in the communities most directly affected should have ample opportunity for meaningful input into the decision-making process. 7 All US funding of Russian programs should be contingent on compliance with the appropriate environmental and public process laws. 8

Sarah J. Lindholm

WR007

WR007–5 **Nonproliferation**

In order to address security against terrorist-related incidents, all intersite shipments of plutonium for the surplus plutonium disposition program would be made using DOE's SST/SGT system. This involves having couriers that are armed Federal officers, an armored tractor to protect the crew from attack, and specially designed escort vehicles containing advanced communications equipment and additional couriers. Further, DOE does not anticipate the need for any additional security measures at reactor sites, other than for the additional security applied for the receipt of fresh fuel. Commercial reactors currently have armed security forces, primarily to protect against perimeter intrusion. There would be increased security for the receipt and storage of fresh MOX fuel, as compared with that for fresh LEU fuel, for additional vigilance inside the perimeter. However, the increased security surveillance would be a small increment to the plant's existing security plan. After irradiation, the MOX fuel would be removed from the reactor and managed with the rest of the spent fuel from the reactor, eventually being disposed of at a potential geologic repository built in accordance with the NWPA.

WR007–6 **Nonproliferation**

Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

WR007–7 **General SPD EIS and NEPA Process**

This comment is addressed in response WR007–3.

WR007–8 **DOE Policy**

For fiscal year 1999 (starting October 1998), the U.S. Congress appropriated funding to assist Russia in design and construction of a plutonium conversion facility and a MOX fuel fabrication facility. This funding would not be expended until the presidents of both countries signed a new agreement.

In July 1998, Vice President Gore and former Russian Prime Minister Sergei Kiriyenko negotiated the *Agreement on Scientific and Technical Cooperation in the Management of Plutonium* that enables the two countries to explore mutually acceptable strategies for disposing of surplus weapons-usable plutonium. The U.S. and Russian governments are currently working on their respective plutonium disposition programs under a *Joint Statement of Principles* which was signed by Presidents Clinton and Yeltsin on September 2, 1998, in Moscow. The two presidents agreed on principles to guide implementation of this program by building industrial-scale facilities in both countries. In 1999, negotiations are proceeding for a *Bilateral Plutonium Disposition Agreement* to enable the United States and Russia to work together to ensure that the disposition facilities are technically viable and that progress is made on implementing the selected approaches. Through these agreements and others that may be negotiated, the United States is attempting to work with Russia to safely disposition its surplus plutonium.

Nuclear Regulatory Commission Plant Performance Reviews of Proposed MOX Reactors
Shortcomings, problems, errors, and poor engineering performance

McGuire NRC Plant Performance Review, March 25, 1999
These Duke Power plants in North Carolina began operation in 1981 and 1983. From the NRC's PPR:

"...shortcomings in oversight of diesel generator vendors were noted."

"Several human performance errors during routine plant evolutions were identified..."

"Minor program and procedure problems still indicate room for improvement. In addition to core inspections, a regional initiative inspection is planned for ice condenser inspections during the Unit 2 refueling..."

"An area for improvement was engineering programs and processes such as ... procedures and work instructions for maintenance and calibration of instrumentation...."

"... some fire protection system maintenance material conditions weaknesses have been noted..."

"Self-identified problems with fire barrier penetration seals were reported to the NRC and improvements are being made."

Catawba NRC Plant Performance Review, March 25, 1999
These Duke Power reactors began operation in 1985 and 1986. The following excerpts are from the NRC's PPR:

"Unit 1 experienced a forced outage of approximately three weeks in duration due to blocked flow channels in portions of the ice condenser."

"Engineering performance continued to be acceptable but declined since the last assessment as a result of emergent issues rooted in shortcomings in engineering's performance." 6

"Examples of poorly supported or non-conservative operability or root cause determinations were noted."

"Problems in maintenance programs and processes included examples of surveillance deficiencies for ventilation systems and ice condensers."

"The engineering performance decline was the result of deficiencies in auxiliary building ventilation system testing, an overheating event of the upper surge tank, and degraded conditions in the Unit 1 ice condenser. While the issues were ultimately resolved properly, each had roots in poor engineering performance."

North Anna NRC Plant Performance Review, March 24, 1999
Virginia Electric and Power Company's North Anna reactors started up in 1978 and 1980. From the NRC's PPR:

"...several examples of inadequate or untimely problem resolution were noted."

"A number of human performance problems, especially during refueling outages, indicates a decline in operations performance during infrequently performed evolutions."

"...poor material conditions of the auxiliary feedwater pipe tunnels and continued problems with microbiological induced corrosion in the service water system...."

"...however a negative trend was noted in the area of problem resolution. There were performance-based examples of inadequate corrective actions where equipment problems were not aggressively pursued and corrected. The initial proposed corrective action for a violation involving pipe supports not installed in accordance with the drawings was inadequate. Only after NRC involvement was adequate corrective action initiated. Corrective actions to resolve corrosion of the auxiliary feedwater tunnel pipe supports which had been identified in September 1996 were also inadequate. An AFW safety system engineering inspection (SSEI) conducted in July 1998 concluded that the system met the design basis requirements, however, mechanical calculations had numerous discrepancies."

FR005

Esse quam videre

FR005–9 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's request for additional public hearings in the communities surrounding the proposed reactor sites that would use the MOX fuel. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

KARPEN, LEAH R.
PAGE 1 OF 3

Leah R. Karpen 400 Charlotte St #803 Asheville NC 28801 Phone: 828-254-5489 FAX: 828-254-5489 email:

Friday, June 18, 1999

U.S. Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, DC 20026-3786

Dear Decision-Makers:

Use of Mixed-Oxide Fuel

Since I was unable to attend the June 15th hearing in Washington, DC, I wish to comment on the proposed plans for disposition of weapons-grade plutoniun

I strongly oppose the use of weapons-grade plutonium in commercial nuclear power reactors, that called mixed-oxide fuel or MOX for short. 1

The Department of Energy should hold hearings near the potential reactor sites that would use MOX fuel. Sites were chosen in South Carolina, North Carolina and Virginia. People living in those areas should have a chance to express their opinion on the proposals; and you would have a chance to hear from them. 2

The use of MOX in the United States could encourage other nations to embrace a plutonium fuel economy. Also, a severe accident at a reactor fueled with MOX could cause many cancers. 3

Immobilization of plutonium in glass costs less than MOX and is successfully 1
underway already. When utilities use MOX they will be heavily subsidized by the government; in other words, taxpayers would be paying utilities to use MOX.

Any number of organizations have protested the use of plutonium as an energy source. Is it not time for the government to listen to its people? 4

Sincerely yours,

(Mrs.) Leah R. Karpen
Concerned Citizen

MR008

MR008–1 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. DOE has identified as its preferred alternative the hybrid approach. As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach, which includes both immobilization and MOX fuel, would be more expensive than the immobilization-only approach. However, pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

MR008–2 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's request for additional public hearings in the communities surrounding the proposed reactor sites that would use the MOX fuel. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

MR008–3 **Nonproliferation**

Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials. DOE will continue to discourage Russia from reprocessing its spent nuclear fuel and starting a plutonium cycle but this issue is beyond the scope of this SPD EIS.

There are differences in the expected risk of reactor accidents from the use of MOX fuel. Some accidents would be expected to result in lower consequences to the surrounding population, and thus, lower risks, while others would be expected to result in higher consequences and higher risks. There is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

MR008–4 **MOX Approach**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to produce energy. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

PERRY, LLEWELLYN
PAGE 1 OF 1

June 9,1999
104 Stuyvesant Rd.
Asheville, N.C. 28803

Mr. Bert Stevenson
NEPA Compliance Officer
U. S. Dept. of Energy
P.O. Box 23786
Washington, D.C. 20026

Dear Mr. Stevenson:

After reading and hearing about the plans forthe production of Mixed-Oxide Fuel (MOX) I am writing to say that I am opposed to this. It is not the way to safely dispose of the plutonium from dismantled nuclear weapons . It would add to rather than lessen the immense radioactive waste burden. The plutonium shoule be immobilized with the utmost vigilance in glass. This lethal material should not be used and should be rendered as safe as possible . 1

I do not want my tax money used to bolster up nuclear sources of electricity. 2

Sincerely,
Llewellyn Perry
Llewellyn Perry

cc: The President of the United States
Mr. Frederic Pena, Secretary of Energy
Senator Charles Carter, N.C. Assembly
Senator Steve Metcalf, " "
N.C. Publice Utilities Commission
Duke Power

MR005

MR005–1 **Alternatives**

DOE acknowledges the commentor's support of alternatives that consider only immobilization. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

MR005–2 **MOX Approach**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

PHYSICIANS FOR SOCIAL RESPONSIBILITY
LEWIS E. PATRIE
PAGE 1 OF 2

STATEMENT BY LEWIS PATRIE, M.D., M.P.H, PRESIDENT OF WESTERN NORTH CAROLINA OF PHYSICIANS FOR SOCIAL RESPONSIBILITY

DOE SUPPLEMENTAL EIS HEARING ON PLUTONIUM DISPOSITION

14 JUNE 1999, WASHINGTON, D.C.
presented by Curt Wozniak, Physicians for Social Responsibility

The U.S. Department of Energy's current strategy in developing its Environmental Impact Statement is inadequate in that DOE has never held a hearing near the potential reactor sites where MOX fuel would be utilized. DOE proposes that most of the 50 tons of plutonium declared surplus by the military would be converted into MOX for use in civilian nuclear power reactors. Already DOE has signed an $130 million contract for the irradiation of plutonium MOX fuel with DCS, a consortium of contractors including: COGEMA, Inc., Duke Engineering and Services, and Stone and Webster. The six reactor sites that have already been chosen for MOX use are located in South Carolina, North Carolina, and Virginia. 1

The one remaining public hearing announced by the DOE is scheduled in Washington, DC on June 15. This is not a satisfactory alternative to holding hearings in Charlotte and Charlottesville with adequate notice and publicity so that an optimum amount of dialogue and testimony could be aired by citizens who would live closest to where the plutonium fuel would be used .

Furthermore, the characteristics of MOX fuel, as compared with existing nuclear fuel, with its increase in energy output, increasing the radioactive bombardment of the reactor chambers, its characteristic of more rapid increase of energy output and the potential for greater release of carcinogenic nuclides in the event of a significant accident all suggest that it is not as desirable an alternative as the immobilization option. 2

For these latter reasons I oppose the MOX option, but if DOE continues to move forward with this ill advised plan, it would seem that consistent with our democracy, DOE is obligated to holds hearings as I described above.

Lewis E. Patrie, M.D., M.P.H.
99 Eastmoor Drive
Asheville, N.C. 28805

(828) 299-1242 (R)
(828) 258-3500 (o)

DCR014

DCR014–1 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's request for additional public hearings in Charlotte and Charlottesville so citizens living closest to the proposed reactor sites could provide dialogue and testimony. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

DOE conducted a procurement process in accordance with DOE NEPA regulations 10 CFR 1021.216. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. As stipulated in DOE's phased contract with DCS, until and depending on the decisions regarding facility siting and approach to surplus plutonium disposition are made and announced in the SPD EIS ROD, no substantive design work or construction can be started by DCS on the MOX facility. Should DOE decide to pursue the No Action Alternative or the immobilization-only approach, the contract with DCS would end. The contract is phased so that only nonsite-specific base contract studies and plans can be completed before the ROD is issued, and options that would allow construction and other work would be exercised by DOE if, and only if, the decision is made to pursue the MOX approach.

DCR014–2 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. Differences between MOX fuel and uranium fuel are well characterized and can be accommodated through fuel and core design. For example, MOX fuel assemblies can be placed away from reactor vessel walls to decrease the possibility of premature embrittlement. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by the reactor plant operators as part of their license amendment applications. NRC would also consider the plants' ability to use MOX fuel safely taking into account the material condition of the proposed reactors.

There are differences in the expected risk of reactor accidents from the use of MOX fuel. Some accidents would be expected to result in lower consequences to the surrounding population, and thus, lower risks, while others would be expected to result in higher consequences and higher risks. There is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

The remainder of this comment is addressed in response DCR014–1.

UNITARIAN UNIVERSALIST CHURCH OF ASHEVILLE
JEANNETTE O. PATRIE ET AL.
PAGE 1 OF 1

UNITARIAN UNIVERSALIST CHURCH OF ASHEVILLE
SOCIAL ACTION COMMITTEE
ONE EDWIN PLACE
ASHEVILLE, N.C. 28801

May 16, 1999

Secretary of Energy Bill Richardson
1000 Independence Ave. SW
Washington, DC 20585

Dear Secretary Richardson

We are concerned about proposed the plutonium fuel use in civilian nuclear reactors and ask for formal public hearings on MOX to be held in cities near the nuclear reactors selected for MOX: Charlotte, NC and Charlottesville VA. 1

Sincerely yours,

Jeannette O. Patrie
Louis E. Patrie, MD
Ruth Beard
Al [illegible]
Nancy Palmberg
[illegible]
Sam [illegible]
Robert M. MacPherson, Ph. D.
[illegible]
Timothy [illegible], M.D.

MR003

MR003–1 **General SPD EIS and NEPA Process**

DOE acknowledges the commentors' request for additional public hearings in Charlotte, North Carolina, and Charlottesville, Virginia. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

WINGEIER, DOUGLAS E.
PAGE 1 OF 1

36 Bust-O'-Dawn Drive
Waynesville, NC 28786
June 22, 1999

U.S. Department of Energy
Office of Fissile Materials Disposition
PO Box 23786
Washington, DC 20026-3786

Dear Friends:

I write to urge you not to use weapons-grade plutonium in commercial nuclear power reactions, called mixed-oxide fuel, or MOX. Instead, I urge you to employ the option of immobilizing the plutonium in glass.

I believe MOX is a bad idea because it is dangerous, is slower and more expensive, is not needed, and is not wanted. 1

I also urge you--before implementing any policy for disposing of weapons-grade plutonium--to hold hearings in all affected communties--especially those near the chosen reactor sites. It is only fair that the people who would be affected by this dangerous material should have an opportunity to be heard. 2

Sincerely,

Douglas E. Wingeier

Dr. Douglas E. Wingeier

MR010

MR010–1 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. DOE has identified as its preferred alternative the hybrid approach. As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach, which includes both immobilization and MOX fuel, would be more expensive than the immobilization-only approach. However, pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

MR010–2 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's request for public hearings in all communities affected by the use of MOX fuel, especially those near the proposed reactor sites. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public meeting held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

Cahall, Diana I.
Page 1 of 13

U.S. Department of Energy
Office of Fissile Materials
c/o SUPPLEMENT to the SPD EIS
P.O. Box 23786
Washington, D.C. 20026-3786
Attention: Office of NEPA Compliance
facsimile: 1-800-820-5156

June 28, 1999

Dear Administrator:

Please consider this correspondence part of the official record of proceedings on the SUPPLEMENT TO THE SURPLUS DISPOSITION DRAFT ENVIRONMENTAL IMPACT STATEMENT, DOE/EIS-0283-DS submitted during public comment period.

Although I was unable to attend the June 15, 1999 public hearing on the above-referenced agency proceedings, I appreciate notification in advance of hearing as I have been an interested party in agency decision-making process.
Due to demands from other matters, these comments will address major issues and concerns rather than specifically reference the entire document presented for public review. Areas of concern include:

I. THE AGENCY'S PROCEDURE FOR DECLARING SOME 50 METRIC TONS OF PLUTONIUM EXCESS TO
AGENCY NEEDS. (See Attachment I.) Furthermore, the agency has considerable vested
financial program-wide interest in the considerable funds generated by the "sale" and/or
"transfer" of the Pu to private, commercial interests for MOX nuclear power plant fuel.
"Hybrid Alternative" (disposal as waste of some of the Pu declared excess to program needs
along with "recycling" of some allows for multitudes of options by both commercial
interests in the property and the agency. 1

II. The agency and the electricity utility industry have considerable options by
identifying "hybrid alternative" in the process. Due to some uncertainty in the legality
of passing "stranded costs" (particularly the investments in nuclear power) on the
electric utility consumers, the hybrid option appears to offer considerable advantage to
the nuclear utility investors as final decisions on such stranded utility costs are being
made. The agency is mandated to consider the financial impacts of decisions made in
regard to such monetarily valuable "excess" property.

III. DOE has identified three facilities required for "hybrid alternative" implementation:
1) pit disassembly and conversion, 2) immobilization, and 3) MOX fuel fabrication. DOE
has, should final decision as it appears from Draft EIS Supplement, determined to
construct and operate BOTH AN IMMOBILIZATION FACILITY which requires disposal site(s) AND
A MOX FUEL FABRICATION FACILITY which can be predicted to result in considerable 2
environmental impact during both operational and shutdown phases. Obviously, a MOX fuel
fabrication facility requires considerable investment (presumably of public funds by DOE)
for construction, operation, shutdown, as well as, disposal of radioactive waste generated
by the operations. DOE is respectfully requested to consider the amounts of hazardous,
toxic, and radioactive wastes to be generated by the processes in its "recycling" 3
decision. MOX fuel fabrication, in total, adds considerable expenditure of public funds
directly and indirectly with considerable benefit to the nuclear/electric utility 2
industry.

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FR013–1 **MOX Approach**

To demonstrate the United States' commitment to the objectives of the *Joint Statement by the President of the Russian Federation and the President of the United States of America on Non-proliferation of Weapons of Mass Destruction and the Means of Their Delivery*, President Clinton, in January 1994, declared fissile materials, including 50 t (55 tons) of plutonium, to be surplus to U.S. nuclear defense needs. The way in which DOE determined the specific plutonium to be declared surplus is different from the way in which DOE determines how buildings, facilities and equipment are surplus. DOE's methods for determining excess or surplus property is not within the scope of this SPD EIS.

The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel fabrication cost exceeds the cost of the LEU fuel that it displaced, the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. Financial considerations are part of the decisionmaking process; however, this EIS does not address cost issues. Rather, it evaluates the potential health, safety and environmental impacts of the proposed activities. Cost considerations are discussed in *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998). This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

FR013–2 **Cost**

As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach, which includes both immobilization and MOX fuel, would be more expensive than the immobilization-only approach. However, pursuing the hybrid approach provides the United States important insurance against potential disadvantages of implementing

IV. DOE decision-making process has identified six (6) site specific reactors for the use of MOX fuel. DOE contention that "no construction on the proposed MOX fuel facility would begin before an SPD EIS ROD is issued"
(COVER SHEET: DOE/EIS-0283-DS) apparently means that site-specific construction public notice only remains in the implementation process. DOE has already made and announced decisions which require construction with considerable lack of public review and oversight in the process. DOE should be integrating the environmental impacts of siting any such facility into the process rather than make decisions which REQUIRE THE FACILITY! DOE is herein requested to do so in final EIS. 4

V. The agency has essentially passed the "safety" to workers and general public within 50 mile radius of the proposed six MOX reactor sites to the Nuclear Regulatory Commission. DOE should not narrow its review and consideration of safety issues based upon NRC's authority to license nuclear reactors. NRC has determined that "public participation" in NRC nuclear power plant licensing be limited to ONLY parties living within a 50 mile radius of each facility. NRC has no authority to limit public participation by citizens, taxpayers, and interested parties in the process, although the commission already appears to have granted itself the authority. DOE cannot "tailgate" on NRC licensing of these six (or some of the six) nuclear generating facilities to implement NEPA when DOE has cause to know in advance that fully informed public participation has already been removed from NRC process. 5

VI. DOE has presented "risk factors" to nuclear power plant workers and the general public from normal operations which suggest simultaneously that environmental releases and radiological exposures will increase from normal plant operations if MOX fuel is used, and no "significant" risks to workers and/or the general population will result. How many increases in fatal cancers and/or other related diseases does DOE intend to permit as "insignificant impacts" from MOX fuel plant operations? 6

Furthermore, DOE acknowledges that fatalities among the general population will increase should nuclear accident occur at these facilities should the MOX fuel proposal be implemented. Increase or likely increase in fatalities among the general population resulting from accident (particularly worst case scenario, as DOE is mandated to consider) are not easily reconciled with "insignificant" impacts to human health and the environment. Any probability of increase in fatalities must be considered by DOE as "significant" in final EIS, otherwise DOE actions result in "lowering" the standard for public health and safety by the failure to do so in NEPA process. 7

VII. DOE is responsible for implementing decisions protective of national security in policy-making decisions on Surplus Plutonium. It seems rather obvious that "hybrid alternatives" (some disposal as waste/some recycling) creates considerable vulnerability in accounting for the total 50 metric tons of Pu currently under program disposition consideration. 8

VIII. DOE (and its predecessor agencies) has historic pattern of under estimating and/or ignoring health risks to citizens when matters of national security appeared to conflict with implementation of other agendas. (See Attachment II.) Furthermore, in practice, such assignment of low value to citizens frequently was done on populations considered to be "low-use." Environmental justice requires that rural and minority members of the general population receive the same degree of consideration and protection from operational and accidental radiological and toxic exposures as other segments of the U.S. citizenry. DOE six candidate sites appear to avoid metropolitan centers in the Northern states, and propose risk at sites within 50 mile radius of rural, Southern populations. 9

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either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

The remainder of this comment is addressed in response FR013–1.

FR013–3 **Waste Management**

DOE has evaluated waste management in this SPD EIS. As shown in Appendix H and Chapter 4 of Volume I, some additional waste would be generated if DOE decides to convert 33 t (36 tons) of the surplus plutonium to MOX fuel versus immobilizing all of the plutonium. This can be seen by comparing Alternative 2 at Hanford (17 t [19 tons] immobilized and 33 t [36 tons] fabricated into MOX fuel) to Alternative 11A (all 50 t [55 tons] immobilized) or Alternative 3 at SRS to Alternative 12A in Section 2.18. These potential impacts will be considered in DOE's decision, along with other environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

FR013–4 **General SPD EIS and NEPA Process**

DOE has not made or announced decisions that would prejudice the outcome of the NEPA process. DOE has indicated its preference of implementing the hybrid approach to surplus plutonium disposition and locating the three proposed facilities at SRS. However, decisions will be announced in the ROD, and will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. As explained in Section 2.1.3, a contract was awarded to DCS to design, request a license, construct, operate and eventually deactivate the MOX facility, and provide the reactors to irradiate the MOX fuel based on a competitive procurement that included evaluation of environmental impacts. The contract stipulates that there would be no construction, fabrication, or irradiation of MOX fuel until the SPD EIS ROD is issued. Such site-specific activities would depend on decisions in the ROD, and according to the Request for Proposals, DOE's exercise of contract options to allow such activities would be contingent on the ROD.

FR013–5 **Human Health Risk**

DOE acknowledges the commentor's remarks concerning NRC policies. However, DOE has no authority in matters pertaining to NRC's policies and practices.

Since the inception of the fissile materials disposition program, DOE has supported a vigorous public participation policy. DOE has conducted public hearings in excess of the minimum required by NEPA regulations to engender a high level of public dialogue on the program. With respect to the reactor sites, DOE prepared a *Supplement to the SPD Draft EIS* that included, among other topics, reactor-specific information that was not available when the SPD Draft EIS was distributed for public review. Efforts were made to contact persons living near the selected reactor sites and inform them of the proposed use of MOX fuel. The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. For those interested parties who could not attend the hearing on the *Supplement* that was held in Washington, D.C., on June 15, 1999, DOE provided various other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. It is DOE policy to encourage public input into these matters of national and international importance.

FR013–6 **Human Health Risk**

As discussed in Section 4.28, the increase in risk to the general public and workers associated with the use of MOX fuel is expected to be small. No additional LCFs would be expected from the use of MOX fuel under normal operations at the proposed reactors. The dose to the general public from the continued safe operation of these reactors, regardless of whether MOX fuel is being used, is a very small fraction of natural background radiation and is not expected to result in any additional LCFs in the surrounding communities. In the case of reactor accidents analyzed in Section 4.28, there is a small increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the limiting design basis accident). The largest increase in risk for severe (beyond-design-basis) accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48,000 per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

FR013–7 **Facility Accidents**

As discussed in response FR013–6, there is an increase in the risks associated with some of the severe reactor accidents analyzed in this SPD EIS. In the case of severe accidents at any of the reactors, the consequences of an accident would be high regardless of whether the reactors were using MOX fuel or LEU fuel. However, the probability of these accidents occurring is very low so the increase in risk to the communities surrounding these plants is not considered significant.

FR013–8 **Nonproliferation**

DOE does not believe that the hybrid approach creates vulnerability in accounting for the surplus plutonium. The proposed DOE surplus plutonium disposition facilities are all at locations where plutonium would have the levels of protection and control required by applicable DOE safeguards and security directives. Safeguards and security programs would be integrated programs of physical protection, information security, nuclear material control and accountability, and personnel assurance. In addition, intersite transportation of plutonium-bearing materials would be made in DOE's SST/SGT system. SST/SGTs are components of an 18-wheel tractor-trailer vehicle that are specially designed to protect against theft or diversion of nuclear materials cargo. The amount of plutonium that would be removed from each pit at the pit conversion facility would be documented, and that documentation carried forward throughout the disposition process, either immobilization or MOX fuel fabrication. None of the plutonium used in MOX fuel would be recycled or reprocessed. It would be used once in the reactor and then treated as any other spent fuel destined for burial in a potential geologic repository.

DOE is required under Presidential Executive Order to avoid conclusion that excess 9

[redacted] 10

IX. DOE attention to matters of considerable national security issues has failed to include the probable potential for sale of fissile materials by its contractors. DOE Oakridge Operations has begun transfer of 3,800 metric tons of Low-Enriched Uranium and Uranium Metal in various forms from the Fernald, Ohio (FEMP) site to the Portsmouth Gaseous Diffusion Plant site for "interim" storage until the materials can be permanently housed or sold based upon an Environmental Assessment only! It would appear rather obvious that United States Enrichment Corporation has considerable likelihood of becoming the "excess fissile/nuclear materials" sales agent in the process.

DOE has more than ample reason to require stringent accounting for the total Plutonium presently in agency inventory at various sites nationwide from its contractors.
It would appear that 50 metric tons of Pu declared as excess inventory is rather arbitrary 11
considering the agency's discrepancies in identifying how much Pu is actually located at various sites nationwide.
(See Attachment IV.) DOE is mandated to consider non-proliferation issues as crucial to national security regardless of the "market value" of the fissile material to private interests (who may or may not consider national security as a high priority). (See Attachment V.)

It would appear to run contrary to logic as well as national interests to offer excess Pu (fissile material NOT REQUIRED by foreign powers for civilian nuclear power generation) to foreign powers interested in obtaining global superpower status! China, for example, is reported to have a track record of spreading missile technology to countries who have not at this time achieved nuclear superpower status, including, North Korea, Iran, Saudia Arabia, and Pakistan (Attachment V.). It would seem to run contrary to logic for the Department of Energy to tighten security at national labs, fund anti-missile delivery systems from hostile foreign powers, and, at the same time directly or indirectly allow the sale of nuclear weapons materials to those same powers! The DOE is respectfully requested to avoid any such considerable lapse in logic regardless of private, commercial interests who might potentially benefit.

IN CONCLUSION:

It is obvious that considerable financial interests would be best served by the 12

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FR013–9 **Environmental Justice**

Impacts of the proposed activities on minority and low-income populations in the areas surrounding all candidate DOE sites and proposed reactor sites were evaluated in this SPD EIS (see Appendix M and Section 4.28). As discussed in Chapter 4 of Volume I, none of the proposed activities is expected to disproportionately impact these populations.

FR013–10 **Facility Accidents**

Section 4.28 was revised to include reactor-specific information, including accident analyses. The accident frequencies used are based on the rigorous analyses that reactor licensees provided to NRC under oath of affirmation. NRC has reviewed and accepted these licensee analyses as the basis for continued operation of these plants. DOE believes, on that basis, that this information is acceptable for use in this SPD EIS to evaluate the potential impacts of using MOX fuel in the reactors. While it is understood that there are differences from the use of MOX fuel versus LEU fuel, these differences are not expected to result in substantial changes in the frequency of severe accidents in MOX-fueled reactors. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by the reactor plant operators as part of their license amendment applications pursuant to 10 CFR 50.

The remainder of this comment is addressed in response FR013–4.

FR013–11 **Nonproliferation**

No plutonium is being, or will be sold to any entity, foreign or domestic. All the surplus plutonium, including the amount that would be made into MOX fuel, would have stringent accountability, safeguards and security requirements. The primary objective of the surplus plutonium disposition program is to ensure that these materials are never again used in nuclear weapons. The market value of this material is not an issue.

The remainder of this comment is addressed in response FR013–8.

FR013–12 **MOX Approach**

DOE acknowledges the commentor's opposition to the hybrid approach to surplus plutonium disposition. Use of MOX fuel in domestic, commercial the agency's highest priorities in decision-making and project(s) implementation. As such, the agency must conclude that "recycling" Pu as a valuable energy resource fails to provide long term good judgment in excess Pu management. The cost of waste disposal from a MOX fuel fabrication facility requires considerable further environmental degradation during construction, operation, and shut-down phases. A "one-time run through" requires disposal sites and facilities. The total plan may offer some interests profitable business returns in the short term, however, the agency is required to consider the long term costs financially, environmentally, to public and worker health, and risks from foreign powers to national security. MOX fuel use at 6 proposed nuclear power facilities has potential for disastrous long term costs and consequences. DOE must consider the long term interests of the nation and all its citizens in NEPA and all other decision-making processes over special interests. 12

One most obvious example of DOE in cooperation with private enterprise with considerable adverse (and on-going consequences) occurred at DOE and its contractor's site in West Valley, New York. The boundaries of the state of Ohio have, apparently, somehow been re-defined to include West Valley as part of federal facilities sites to be overseen by the Ohio Field Office. DOE is respectfully requested to consider past consequences of private/commercial vendor partnerships in current decision-making. The agency has ample reasons and causes to avoid rather than repeat past errors, and is respectfully requested to do so. 13

Thank you for opportunity to comment and participate on what I believe to be a most crucial agency decision-making process. Please provide a list of parties in attendance at the June 15, 1999 hearings and list of parties submitting comments to the agency on or before June 28, 1999 at your earliest convenience. Also, please continue to include my name and mailing address (provided below) on the agency's list of interested parties on Plutonium disposition.

Sincerely,

Diana I. Cahall (Note: restoration of maiden name 2/98, formerly known as Diana Salisbury)
7019 Ashridge Arnheim Road
Sardinia, Ohio 45171
(937) 446-2763 telephone and fax

Attachments (11 pages total) (202) 586-4078

VIA TELECOPIER TRANSMISSION TO ~~1-800-820-5156~~ ON JUNE 28, 1999 AT APPROXIMATELY 1:30 P M. ; and by the United States Postal Service, regular mail, postage prepaid on June 28, 1999.

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reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

FR013–13 **MOX RFP**

DOE is working hard to ensure that lessons learned from past experiences are being applied to all of its programs to ensure they are carried out safely and in an environmentally sound manner. West Valley reports to the Ohio Field Office, but there are DOE personnel on-site at West Valley who are in direct control of the activities there. DOE has entered into successful privatization arrangements, and has an initiative to use privatization in its contracting efforts when doing so is of benefit to the U.S. Government and does not compromise health, safety, the environment, or national security.

Attachment I

GAO

United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-280873

November 4, 1998

The Honorable John R. Kasich
Chairman, Committee on the Budget
House of Representatives

Dear Mr. Chairman:

For fiscal year 1997, the Department of Energy reported that it had $20.8 billion in property, some of which is no longer needed to carry out the Department's missions now that the Cold War has ended. The Department reports, for example, that many of the buildings originally designed and constructed to support its defense mission no longer have any ongoing or planned mission. The Department acknowledges that it needs to reduce its inventories of property and equipment and estimates that, for its largest environmental management sites, it spends about 20 percent of its annual budget on maintaining the facilities and infrastructure.

You requested that we review the Department of Energy's efforts to identify and dispose of property that is excess to its needs. Specifically, you asked us to determine (1) the criteria the Department uses to guide the identification and disposal of excess property, (2) the extent to which the Department's property records reflect what is no longer needed to carry out its missions, and (3) the challenges the Department believes exist in identifying excess property and the innovative approaches being used to dispose of this property.

Results in Brief

Federal property management regulations include criteria to determine when real property[1] is excess to an agency's needs. However, neither federal property management regulations nor the Department of Energy's regulations and guidance include specific criteria to determine when personal property is no longer needed. When property has been identified as excess, guidelines for the disposal process are well defined for both real and personal property. For example, the Department's property management regulations include guidelines for the screening of excess personal property for reuse within the Department or other federal agencies; for the transferring of lab equipment and computers to schools; and for the sale of property to the public.

[1]Real property includes land, improvements, structures, and permanent fixtures. Personal property includes all other property except for real property and includes such things as government-owned equipment, computers, and motor vehicles.

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B-280873

The Department of Energy's property records do not consistently provide information that would help identify property that is no longer needed. Recent changes to the Department's regulations require that property records identify property that has already been determined to be excess. In July 1998, the Department modified its real property records system to identify property that has been determined to be excess. This system also provides additional information, such as the percentage of a facility currently in use, that could be used to identify other property that is no longer needed. Similarly, in May 1998, the Department revised its personal property management regulations to require that contractors' records include information on current usage, such as categorizing property as active, in storage, or excess. However, these regulations do not provide criteria for determining when personal property should be placed in these categories.

The Department of Energy acknowledges problems with its identification and disposal of excess real and personal property. Department officials cited, for example, a lack of funding for the environmental cleanup of the current inventory of excess real property and a lack of incentives to identify property as excess. Because the costs associated with the maintenance and storage of unneeded property are generally not separately identified, little incentive exists to spend the resources necessary to dispose of it. Regardless of the problems, field and program offices have developed some innovative approaches to dispose of property, such as including a performance-based incentive in the site management contract to encourage the contractor operating the site to dispose of excess property during the fiscal year.

July 1, 1999

Background

Although most of the Department of Energy's (DOE) real and personal property is under the control of its contractors, several DOE offices have the responsibility for managing this property. Overall, the office of Field Management is responsible for real property management and field oversight, and the office of Procurement and Assistance Management is responsible for personal property. In addition, the Office of Worker and Community Transition directs various efforts regarding the sale or disposition of surplus assets and compiles reports for the Congress on unneeded real and personal property and pilot projects relative to its overall responsibilities. In addition, DOE's program offices, such as the office of Defense Programs, are responsible for declaring property excess to their missions' needs. One program office, Environmental Management, is responsible for the cleanup of contaminated excess property before its

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[illegible] Any clean up required ?

disposal. DOE's field offices oversee the contractors' efforts to manage the property and maintain the property records.

In its fiscal year 1997 financial statements, DOE reported that it held property, plant, and equipment valued at \$20.8 billion[2]—\$12.0 billion of real property and \$5.2 billion of personal property, with construction work in progress, natural resources, and software accounting for the remaining \$3.6 billion. The property amounts include only those items costing \$25,000 or more. Items that cost less than \$25,000 are expensed for financial statement purposes; DOE contractors held an additional \$3.4 billion of such personal property at the end of fiscal year 1997.

In DOE's fiscal year 1997 Federal Managers' Financial Integrity Act report accompanying its financial statements, the Department indicated that it had extensive inventories of real and personal property that is no longer necessary and that disposal of this property could save future storage, security, and maintenance costs. In addition, DOE reported problems with the management of personal property. For example, the Rocky Flats Field Office in Colorado identified problems that included a contractor's inadequate property records systems, incomplete inventory records, and requests made for new work space while comparable space at the site was being designated as excess. (See the bibliography for a list of GAO and Inspector General reports on DOE property management issues.)

Federal Regulations Provide Guidelines for Real Property but DOE's Guidance Does Not Include Criteria for Determining When Personal Property Is Excess

The federal property management regulations specify that executive agencies should dispose of real and personal property that is excess to their needs and include guidelines for determining when real property is unneeded or underutilized. However, neither the federal regulations nor DOE's guidance includes similar specific guidelines for determining when personal property is excess. In the absence of criteria in the federal regulations, it is left up to each agency to develop guidelines. DOE implements the overall federal regulations for its real property and has issued supplemental regulations for managing personal property. However, DOE's regulations for personal property include no criteria for determining when property is excess.

Real Property

The federal property management regulations for the utilization and disposal of real property state that each executive agency should survey the real property under its control at least annually to identify property

[2]This represents the depreciated value of the property, plant, and equipment; the acquisition costs were \$46.9 billion.

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Attachment II

Part of:
Radiation
Experiments
On Humans

A10 WEDNESDAY, MAY 12, 1999

Bioethics center opening in Tuskegee

Syphilis untreated in old study there

The Associated Press

TUSKEGEE, Ala. — A new bioethics center focusing on medical issues for minorities is opening in the town where black men with syphilis went untreated for 40 years as part of a notorious government study.

'We expect for the first time to be training and educating significant numbers of African-Americans as bioethicists — something we don't have now.'

— Benjamin Payton

The Tuskegee University National Center for Bioethics in Research and Health Care opens Saturday. Survivors of the experiments, ranging in age from 89 to 109, will be on hand.

"We expect for the first time to be training and educating significant numbers of African-Americans as bioethicists — something we don't have now," said Benjamin Payton, the university president.

The center was helped by a $200,000 grant President Clinton announced in 1997, when he apologized on behalf of the government for the syphilis study.

In the 1930s, the federal Public Health Service lured black subjects in Tuskegee with the promise of free health care. A total of 399 men were never told they had syphilis, and researchers monitored how the disease claimed its victims.

By the time the study was exposed in 1972, 28 men had died of syphilis, 100 others were dead of complications, at least 40 wives had been infected and 19 children had contracted the disease at birth.

Tuskegee University, a historically black college known then as Tuskegee Institute, was not involved.

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The Cincinnati Enquirer

Attachment III

THURSDAY, MAY 13, 1999 A3

Russia, Cuba may finish nuclear plant U.S. opposes

The Associated Press

MOSCOW — A Russian-Cuban commission is looking into the possibility of completing a partly built nuclear reactor in Cuba, a news report said Wednesday.

Construction of two Soviet-designed, light-water reactors began in the early 1980s, but financial problems in Cuba and the Soviet Union forced a halt to the project, and no more work has been done in recent years despite periodic discussions.

The possibility of setting up a joint venture to complete the Juragua nuclear plant was the main item on the agenda of the Intergovernmental Russo-Cuban Commission for Trade, Economic, Scientific and Technical Cooperation, Russia's ITAR-Tass news agency said.

Russia is proposing that two or three other countries be included in the venture, the report said.

The plant would cost $650 million to $700 million to complete, earlier news reports said.

The United States opposes the station and considers it a safety risk to Florida and other states along the Gulf of Mexico. Cuba is 90 miles south of Florida. *

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Attachment IV

SHORT TERM

FROM PAGE 18

neering and Environmental Laboratory alone —enough to make 200 or more nuclear bombs (see table below).

Conclusion

So long as the politically expedient Yucca Mountain and WIPP programs command the lion's share of resources available for long-term management, no sound solution can be developed for nuclear waste. Hence, it is essential that the US government step back from these repository programs and initiate a much broader effort (see "Considering the Alternatives" article). In the meantime, it is essential that an interim management strategy be implemented that addresses the issues of safe storage, the legitimate complaints of nuclear utilities regarding the federal government's obligations, and the research and development that will be essential for a long-term program. The investment in Yucca Mountain and WIPP need not be thrown away. These facilities could be used for research on repositories using non-radioactive materials, pending approval by the state of New Mexico for WIPP, and by the state of Nevada and the Western Shoshone people in the case of Yucca Mountain.

1 I am grateful to Rochelle Becker, Beatrice Brailsford, Lee Dazey, Yuri Dublyansky, Kay Drey, Harold Fieveson, Steve Frishman, Charles Hollister, David Lochbaum, Michael Marriotte, Mary Olson, Auke Piersma, John Winchester, and Ian Zabarte for their reviews of a draft of this article and the article on long-term approaches. They may or may not be in agreement with the contents of these articles for which I, as the author, am solely responsible.

2 Transuranic waste is defined by the DOE as containing more than 100 nanocuries per gram of transuranic radionuclides that emit alpha radiation and that have half-lives of more than 20 years. The term transuranic refers to all elements that have atomic numbers greater than that of uranium.

3 See for instance, Arjun Makhijani and Scott Saleska, *High-Level Dollars, Low-Level Sense* (New York: Apex Press, 1992). See also *Science for Democratic Action* (SDA), Vol. 4 No. 4, Vol. 6 No. 1, and Vol. 7 No. 2, as well as IEER's report *Containing the Cold War Mess* (for WIPP-related issues). For details regarding one geologic aspect of Yucca Mountain see Yuri Dublyansky, *Fluid Inclusion Studies of Samples from the Exploratory Study Facility, Yucca Mountain, Nevada*, IEER, December 1998.

4 See IEER's report *Containing the Cold War Mess*, 1997 by Marc Fioravanti and Arjun Makhijani for a detailed analysis. Also see "Transuranic Waste: TRU and Consequences," *SDA* Vol. 7 No. 2, p. 7.

5 At a nuclear waste meeting sponsored by the DOE, a utility executive, in a frank expression of the NIMBY syndrome, told the DOE that it had to take the waste from the utilities and "I don't care where you put it." The ground rules of the meeting prohibit disclosure of the identity of the speaker but not what was said. A statement by Scott Peterson of the Nuclear Energy Institute in the *New York Times* provides another illustration: "The industry foremost is looking for movement of fuel," he is quoted as saying. ("Energy Agency Plans Offer to Take Utilities' Nuclear Wastes," *New York Times*, February 25, 1999.)

6 For more information about the use of transmutation as a waste management strategy, see "Transmutation not a Repository Alternative," *SDA* Vol. 6 No. 1, p. 4.

7 For a discussion of waste classification issues, see *High-level Dollars, Low-level Sense*, pp. 22–28 and Chapter 4. Also *SDA* Vol. 6, No. 1, pp. 8–13.

8 In some instances, such as in severe earthquake zones or on riverine islands, storage near the site may be safer than on site. However, moving the waste would give rise to its own issues and is generally difficult to accomplish.

9 Among the many options that have been proposed are: an MRS at Yucca Mountain; a "private" MRS such as the proposed site on the Skull Valley Goshute reservation in Utah; and storage at a DOE nuclear weapons site. The last is sometimes combined with suggestions that the spent fuel be reprocessed, for instance at the Savannah River Site.

10 Matthew L. Wald, "Plan to Bury Nuclear Waste in Nevada Moves Forward," *New York Times*, Dec. 19, 1998.

PLUTONIUM IN BURIED WASTE AT SELECTED SITES

Site	Amount of plutonium in buried waste, kilograms	Number of bombs equivalent[a]	Comments
Idaho National Engineering and Environmental Laboratory	1,100[b]	220	The only site with an estimate that has a discoverable technical rationale
Los Alamos National Laboratory	Unknown	Unknown	Total quantity of plutonium-239 in all Los Alamos waste is possibly 610 or 1375 kilograms. Discrepancy is between two official estimates.
Savannah River Site	250 (unreliable estimate)[c]	50	Does not include plutonium in high-level waste tanks estimated at 382 or 774.6 kilograms. Discrepancy is between two official sources.

Sources: IEER's 1997 report *Containing the Cold War Mess*, Chapter 2. For discrepancies: Guimond, R.J. and E.H. Beckner, Memorandum on Plutonium in Waste Inventories. U.S. DOE, January 30, 1996.

a. We assume that 5 kilograms of plutonium are required for a nuclear bomb. Technologically sophistocated devices can be made with much less.

b. Plutonium-239 plus plotonium-240. Rounded to two significant figures.

c. Plutonium-239 only. Rounded to two significant figures.

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Attachment V

The Cincinnati Enquirer, 6/28/99, A/C

JAMES H. ANDERSON: Cox report shows need for SDI

Early alert for missile defense

The most disturbing — and overlooked — conclusion to be drawn from the Cox report on Chinese espionage is that China now has the technical information to build missiles capable of overwhelming the Clinton administration's proposed national missile defense.

The White House will not decide until June of next year whether to field such a program. But the deployment timetable is now largely irrelevant because the administration's ground-based missile interceptors would be vulnerable to Chinese countermeasures from Day 1.

Beijing currently has two dozen single-warhead, intercontinental-range weapons, 13 of which are believed to be targeted at U.S. cities. But China is expected to exploit the theft of sophisticated U.S. nuclear-warhead designs to enhance its submarine and mobile missile programs. China likely will develop missiles capable of delivering multiple independently targeted re-entry vehicles and penetration aids such as decoys. In other words, China has the potential to become a nuclear superpower.

China also has a record of spreading missile technology to the Third World, including states such as North Korea, Iran, Saudi Arabia and Pakistan. Last August, North Korea test-fired a three-stage rocket, the Taepo Dong-1, which struck deep in the Pacific Ocean. Now Pyongyang is preparing to test the Taepo Dong-2, which has the potential to reach Alaska, Hawaii and possibly Los Angeles.

The Clinton administration's missile defense plan will be inadequate to meet emerging missile threats, whether from China, North Korea or any other state. The effort to build one, possibly two, ground-based sites would be far more costly and less effective than sea- and space-based alternatives. A ground-based system would have a narrow window of time to intercept missiles tipped with multiple warheads and decoys that have separated from their rocket boosters. Even if the intercept were successful, deadly fallout from a nuclear, chemical or biological weapon would occur.

To counter this threat, the United States should develop defenses to identify, track and shoot down hostile missiles shortly after liftoff, when they are most vulnerable to interceptors and before they can release their payload. By developing this "boost-phase" intercept capability, the United States will offset the ability of China, or any other country, to endanger Americans with ballistic missiles.

Sea- and space-based defenses hold the greatest promise for achieving a "boost-phase" intercept capability. The United States should begin by upgrading the anti-missile capability of the Navy's Aegis defense system, first deployed over a decade ago to protect the U.S. fleet. Taking advantage of the inherent mobility of sea power, Aegis cruisers could patrol international waters off China and destroy missiles in their boost phase. Eventually, the United States could reinforce its sea-based defenses with space-based interceptors.

The United States could begin developing a robust defense along these lines. But despite the weekend agreement between President Clinton and Russian President Boris N. Yeltsin to take another look at the 1972 Anti-Ballistic Missile Treaty, it has been the White House's belief that the United States remains legally bound by the treaty, which limits missile defenses to one fixed site. Some legal scholars and strategists have long believed that the treaty is no longer binding because neither Russia nor any other combination of successor states can fulfill its original purposes.

Congress should ensure that efforts to develop sea- and space-based systems capable of protecting the United States from missile attacks are not constrained by the ABM Treaty. They should require the Defense Department to develop and test a more robust version of the Aegis-based Navy theater-wide anti-missile system. The target missile should have the flight characteristics of real-world intercontinental ballistic missiles, such as those being developed by China.

U.S. anti-missile technologies are improving. Now let's begin work on a national missile defense capable of protecting the United States from the threats the Cox report has disclosed.

Mr. Anderson is a defense policy analyst at The Heritage Foundation, a conservative think tank.

FR013

GEARY, B.
PAGE 1 OF 2

2545 S. Birmingham Pl. Tulsa, OK 74114

June 28, 1999

United States Department of Energy
Office of Fissile Materials Disposition
PO Box 23786
Washington, DC 20026-3786

Sirs:

I am writing to comment on the Supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement.

As an Oklahoma resident who remember only too well the carelessness with which plutonium was handled at the Kerr-McGee plant in Crescent, I view the whole MOX plan as unrealistic for human beings to use. 1

The MOX plan would cause plutonium to be considered as a business commodity to be transported across the country rather than the highly toxic substance which it is and which needs to be isolated from the human environment. 2

To claim that the MOX plan would result in a significant reduction in the amount of plutonium is patently ridiculous. There would be a very small net reduction if plutonium were used in a mixed fuel in nuclear power plants.

The MOX plan for dealing with "surplus plutonium" is a plan to play with the stuff rather than to immobilize it, and it is my understanding that MOX would be a very expensive toy. 3

How much would it cost to retrofit aging reactors so that they could utilize the MOX fuel? At what point would safety concerns take a back seat to economic considerations? Accidents would be more likely, I believe, at a retrofitted plant, and they would certainly be far more dangerous.

Any serious problems with nuclear power would only be exacerbated with the use of MOX. It is simply terrifying to think of such casual use of plutonium in the U.S., where control is imperfect. What about in Russia? MOX would be a bad choice for the U.S. public, for the nuclear power industry, and for the planet. Get real! 4

Yours truly,

B. Geary

B. Geary

MR020

MR020–1 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

MR020–2 **Transportation**

Transportation would be required for both the immobilization and MOX approaches to surplus plutonium disposition. Transportation of special nuclear materials, including fresh MOX fuel, would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material. The transportation requirements for the surplus plutonium disposition program are also evaluated in Chapter 4 of Volume I and Appendix L.

MR020–3 **MOX Approach**

It is true that in the MOX approach only a fraction of the plutonium would actually be consumed in the reactor; but the remainder would be an integral part of massive spent fuel assemblies. The spent fuel assemblies would be so large and radioactive that any attempted theft of the material would require a dedicated team willing to suffer large doses of radiation, along with substantial equipment for accessing and removing the spent fuel from the storage facility and carrying it away.

The purpose of fabricating MOX fuel and using it in domestic, commercial reactors is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program. Furthermore, although no U.S. commercial reactors are licensed to use plutonium-based fuel, several are designed to use MOX fuel, and others can easily and safely accommodate a partial MOX core.

The environmental, safety and health consequences of the MOX approach at the proposed reactors are addressed in Section 4.28. In addition, NRC would evaluate license applications and monitor the operations of both the MOX facility and domestic, commercial reactors selected to use MOX fuel, to ensure adequate margins of safety.

MR020–4 **Nonproliferation**

DOE acknowledges the commentor's opposition to the use of plutonium in MOX fuel. The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials.

The remainder of this comment is addressed in response MR020–3.

Spera, Marcella
Page 1 of 1

I am writing because I am deeply concerned about the potential deleterious effects posed by the options you are considering concerning the disposal of plutonium. The MOX option would threaten the health of many. The immobilization option is much more sound. Please analyze both options carefully and come to a responsible decision. Thank you. 1

WR001

WR001–1 **Alternatives**

DOE acknowledges the commentor's opposition to the MOX approach to surplus plutonium disposition. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

DOE and NRC are committed to protecting the health and safety of the public. This includes designing, constructing, and operating DOE- and NRC-regulated facilities (e.g., domestic, commercial reactors) in such a way as to continually provide a level of safety and reliability that meets or exceeds established standards. DOE and commercial reactors also have plans and programs for the safe management and ultimate disposal of their nuclear waste.

The Human Health Risk sections presented in Chapter 4 of Volume I discuss the applicable human health risks associated with all alternatives considered. Decisions on the surplus plutonium disposition program will be based on environmental analyses (including analyses of human health risks), technical and cost reports, national policy and nonproliferation considerations, and public input.

ECONOMIC DEVELOPMENT PARTNERSHIP
Serving Aiken & Edgefield Counties

Fred E. Humes
Director

Statement for the Record
Supplement to the Surplus Plutonium Disposition
Draft Environmental Impact Statement
June 15, 1999

It is my pleasure to speak in support of the Department of Energy's important program to dispose of weapons grade plutonium which is excess to our nations defense needs. My name is Ernie Chaput, and I am with the Economic Development Partnership of Aiken, South Carolina.

As many of you know, the Department's Savannah River Site is located in Aiken County, South Carolina. For the past several years the Economic Development Partnership has evaluated DOE programs proposed for accomplishment at the SRS for consistency with local capabilities and community expectations.

Our community has a long history of supporting DOE national defense and environmental management programs. We are proud of the role our site played in winning the cold war, and we are equally anxious to play a role in reducing the new nuclear danger which has resulted from excess plutonium being released from military needs. As the prestigious National Academy of Sciences has stated, "The existence of this material constitutes a clear and present danger to national and international security." Disposing of surplus plutonium from the U.S. and Russian nuclear programs must be a top priority in the pursuit of world peace and stability.

If the U.S. does not dispose of its surplus plutonium, neither will Russia. Conversely, it is equally important that the U.S. and Russian programs proceed in parallel to prevent concerns about either country gaining a strategic advantage. Together the two countries have indicated that 100 metric tons of weapons-usable plutonium are surplus to current military needs and proposed for disposition. **The opportunity to dispose of enough plutonium to make over 20,000 modern nuclear weapons must been seized upon and aggressively pursued.** 1

We believe that DOE has wisely chosen a hybrid approach for disposition of surplus plutonium:

- Isotopically "denaturing" weapons-grade plutonium by irradiation in a nuclear reactor is the surest and most efficient means of destroying this material. By burning plutonium in mixed oxide fuel, it will undergo nuclear transformation into a product

Post Office Box 1708 Aiken, SC 29802 171 University Parkway USCA
(803) 648-3362 FAX (803) 641-3369 edpsc@aol.com http://www.edpsc.org

DCR013

DCR013–1 **Alternatives**

DOE acknowledges the commentor's support of the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

ECONOMIC DEVELOPMENT PARTNERSHIP
ERNIE CHAPUT
PAGE 2 OF 2

that is no longer capable for efficient use in nuclear weapons and will make theft and recovery of the degraded material extremely difficult.

- Immobilizing weapons-grade plutonium that contains impurities which make it unsuitable for burning in nuclear reactors by mixing with DOE high-level waste and creating solid ceramic and glass-like materials. While this process will not destroy the "weapons-grade" characteristics of the plutonium, it will make theft and recovery of the immobilized material very difficult.

We believe that DOE has properly analyzed safety issues and demonstrated that both options for surplus plutonium disposition can be safety conducted. Oversight by the Nuclear Regulatory Commission will serve to further assure the safe execution of this activity. 1

In summary, as DOE considers the proportion of materials for disposition by irradiation and immobilization, we recommend that the ultimate objective of this program be kept clearly in focus: **Which option provides the greatest surety that the surplus materials can never be used again in modern nuclear weapons.** The Economic Development Partnership believes that future generations will be significantly more secure if we act today to **destroy** our surplus weapons-grade plutonium materials, not just lock them away and make them difficult to recover. Therefore, we believe that burning weapons-grade plutonium in nuclear reactors should be the first option for disposition of surplus plutonium, with immobilization being used only when burning is not possible.

Thank you for the opportunity to comment on this important matter.

DCR013

ENVIRONMENTALISTS INC.
RUTH THOMAS
PAGE 1 OF 5

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FOUNDED 1972

June 28, 1999

Mr. G. Bert Stevenson, NEPA Compliance Officer
Office of Fissile Materials Disposition
U.S. Depart of Energy (DOE)
P.O. Box 23786
Washington, D.C. 20026-3786

Dear Mr. Stevenson:

The purpose of this letter is to let you know that we will be submitting comments on the Supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement around the middle of July.

Notices regarding the availability of the Supplement arrived at our office on June 7th and the document itself several days later. (See attached copies of notices showing they were all mailed on June 3rd).

We ask that our comments be fully considered; that the total text of our comments appear in the final document; and that our mailing address and E-mail address be included.

Thank you for phoning me on June 16th. The information you provided then together with the comment/question and response presentations at the June 24th meeting in Columbia have contributed to our having a better understanding of the DOE's proposals regarding weapons plutonium.

Please send us the transcript or minutes of the June 15th public meeting in Washington. A record of this meeting and a list of those attending will be helpful to us in preparing our comments as will the transcript of the June 24th meeting held by State Senator Phil Leventis. 1

Sincerely,

Ruth Thomas
President

cc - Senator Leventis
Interested Parties

1339 SINKLER ROAD • COLUMBIA, S. C. 29206 • 803-782-3000

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MR023

MR023–1 **General SPD EIS and NEPA Process**

DOE gave equal consideration to all comments received on the SPD Draft EIS and *Supplement to the SPD Draft EIS*. The comments and their responses are presented in Volume III, Chapter 3 and Chapter 4, respectively. The public hearing comment summary report for the *Supplement* and hearing attendance list has been sent under separate cover. Transcripts of the June 24, 1999 meeting hosted by State Senator Phil Leventis are presented as Appendix A in Volume III.

ENVIRONMENTALISTS INC.
RUTH THOMAS
PAGE 2 OF 5

Now Available - The Department of Energy's Supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement

United States Department of Energy

Dear Stakeholder,

The Department of Energy has released a supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement which focuses on information developed as part of the MOX Procurement Process. The comment period for this document is from May 14 to June 28, 1999. You may request a copy of this document as follows:

MAIL
United States Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, DC 20026-3786

FAX/PHONE
1-800-820-5156
Please leave your name and complete mailing address on the answering machine.

WORLD WIDE WEB
http://www.doe-md.com

Office of Fissile Materials Disposition

ANNOUNCING A PUBLIC MEETING ON THE SUPPLEMENT TO THE DRAFT SURPLUS PLUTONIUM ENVIRONMENTAL IMPACT STATEMENT

United States Department of Energy

This is to inform all interested parties that the Department of Energy's Office of Fissile Materials Disposition will hold a public meeting on the Supplement to the Draft Surplus Plutonium Environmental Statement. There will be two identical morning and afternoon sessions.

9:00
1:30

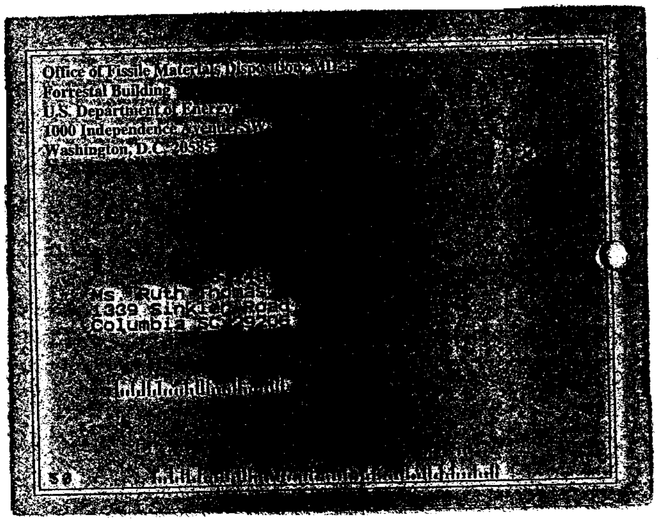
Tuesday, June 15, 1999
9:00am - 12:00pm
and
1:30pm - 4:30pm
Hotel Washington
515 15th St., NW
Washington, DC 20004

Preregistering for the meeting may be done at either:

Website Registration: http://www.doe-md.com
Preregistration Telephone Number: 1-800-820-5134

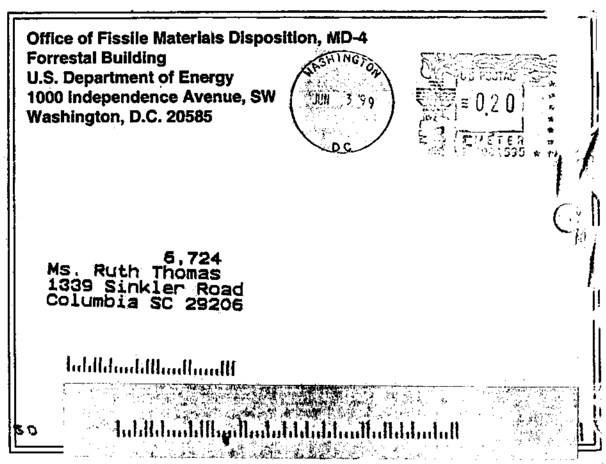
Office of Fissile Materials Disposition

MR023



Office of Fissile Materials Disposition, MD-4
Forrestal Building
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Ms. Ruth Thomas
1339 Sinkler Road
Columbia SC 29206



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Washington, D.C. 20585

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Ms. Ruth Thomas
1339 Sinkler Road
Columbia SC 29206

MR023

ENVIRONMENTALISTS INC.
RUTH THOMAS
PAGE 4 OF 5

Supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement

United States Department of Energy

NOW AVAILABLE

The Department of Energy has released a supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement which focuses on information developed as part of the MOX Procurement Process. The comment period for this document is from May 14 to June 28, 1999. You may request a copy of this document as follows: Process

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United States Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, DC 20026-3786

FAX/PHONE
1-800-820-5156
Please leave your name and complete mailing address on the answering machine.

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http://www.doe-md.com

PUBLIC MEETING

The Department of Energy's Office of Fissile Materials Disposition will hold a public meeting on the Supplement to the Draft Surplus Plutonium Disposition Draft Environmental Impact Statement. There will be two identical morning and afternoon sessions. 1

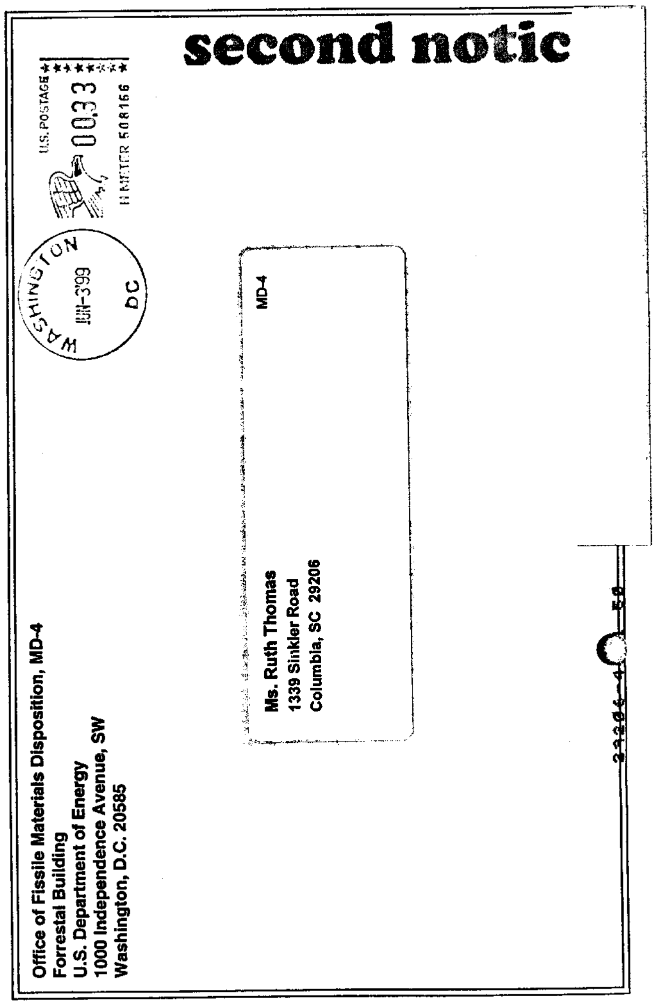
Tuesday, June 15, 1999
9:00am - 12:00pm
and
1:30pm - 4:30pm
Hotel Washington
515 15th St., NW
Washington, DC 20004

Preregistering for the meeting may be done at either:

Website Registration: http://www.doe-md.com
Preregistration Telephone Number: 1-800-820-5134

Office of Fissile Materials Disposition

MR023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U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

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Ms. Ruth Thomas
1339 Sinkler Road
Columbia, SC 29206

MR023

GILBERT, CLAUDE L., JR.
PAGE 1 OF 4

CLAUDE L, GILBERT, JR.
1104 CANDLEWOOD DRIVE
HOPKINS, SOUTH CAROLINA 29061

US Department of Energy
Office of Fissile Materials Disposition
PO Box 23786
Washington, DC 20026-3786

June 24, 1999

RE: Surplus Plutonium Disposition

Dear Sir:

As a native South Carolinian and US citizen, I have followed the events over the past 45 years that have turned my homeland into a nuclear dump. While the thought of ridding the world of surplus plutonium sounds good, I believe your decision to use MOX nuclear fuel in commercial reactors will cause more problems than it solves. 1

Why should I believe you when you state that this process is safe?

1) There are unexplained illnesses or "cancer clusters" around 14 of 14 DOE facilities in the US. Commercial nuclear reactors are nothing more than high level waste dumps for spent fuel rods. Yucca Mountain is nothing more than a pipe dream. 2

2) Westinghouse (aka CBS) after 16 years and $489 million have failed to deal with the waste problems already at SRS. (exploding benzine among many more problems) SC already has radioactive fish in the Savannah River, deformed wildlife and contaminated ground water. A MOX facility will just add to the problem. 3

3) Cogema has not only contaminated the sea bed off of the coast of France, but also the air is 90,000 times more radioactive than background readings. Reprocessing is such a polluting industry that Cogema has turned the air radioactive. Childhood leukemia has increased.

4) BNFL has contaminated the area around Sellafield, England as much as Chernobyl. A slow-motion accident played out over four decades. The seafood is radioactive as well. 4

5) After many years of misleading the public, Germany, the inventers of nuclear power have decided to phase out this technological failure because of economic, health, transportation and safety issues. Using MOX fuel and establishing a plutonium economy with a failed industry will only hurt the US taxpayer and endanger everyone on the planet.

6) Although MOX fuel has been used occasionally in Europe, it is not made with such a high percentage of plutonium-239 as is contemplated for the US. This form of plutonium is the material of choice for nuclear weapons precisely because it is easiest to explode. Obviously, this is not the goal in reactor operation. Compounding the concern about weapons material is the disclosure that the plutonium is not pure. In order to make the weapons, other ingredients were added to the plutonium. One of these is Gallium, which has not been put into a reactor core before, and which interacts with zirconium, one of the metals composing the fuel rod's cladding. Compromise of fuel cladding can cause a host of problems including greatly increased releases of radioactivity to air and water. 5

7) The plan to build a MOX plant at US taxpayer expense in Russia will only guarantee that weapons grade plutonium is spread across the globe under the guise of peaceful nuclear cooperation. Do you trust the Russians? How about their nuclear supply partners Iran and India? 6

As you know, these are just a few of the problems worldwide. I strongly object to the MOX plan. It would be far more prudent to pursue immobilization. 1

Thank you.

Claude L. Gilbert, Jr.

Claude L. Gilbert, Jr.

MR009

MR009–1 **MOX Approach**

DOE acknowledges the commentor's objection to the use of MOX fuel in commercial reactors. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

The safety, health, and environmental consequences of the MOX approach at the proposed reactors are addressed in Section 4.28. In addition, NRC would evaluate license applications and monitor the operations of both the MOX facility and domestic, commercial reactors selected to use MOX fuel, to ensure adequate margins of safety.

MR009–2 **Human Health Risks**

Epidemiological studies performed to determine if excess health effects have occurred, or are occurring, in the vicinity of the candidate sites for surplus plutonium disposition are summarized in the *Storage and Disposition PEIS.* Other DOE sites are beyond the scope of this SPD EIS. Over the past year, DOE and the Department of Health and Human Services (HHS) have produced draft plans to determine the future direction of public health activities at 18 DOE sites (including the sites evaluated in this EIS) and naval shipyards in three States. The plans contain background information on the site; information learned from previous studies and assessments; current public health activities conducted by HHS and DOE; gaps in knowledge and important issues that need to be addressed; and proposed new activities. These plans may be viewed on the DOE Web site at http://www.tis.eh.doe.gov/epi.

This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and

MOX spent fuel. As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository. The potential MOX spent fuel and/or immobilized plutonium are included in the inventory analyzed in that draft EIS.

MR009–3 **Waste Management**

DOE appreciates the commentor's concern that surplus plutonium disposition activities not contaminate the environment. DOE and its contractors at SRS are working hard to remediate existing contamination. In recent years, seepage basins have been closed, pump and treat systems have been installed to remove contaminants from the groundwater, and new wastewater treatment facilities have been installed. Much is yet to be done, but as described in the report, *Accelerating Cleanup: Paths to Closure* (DOE/EM-0362, June 1998), DOE has an ambitious plan to accomplish the cleanup of SRS.

The SPD EIS analyzes the potential environmental impacts associated with implementing the proposed activities at the candidate sites. The results of these analyses, presented in Chapter 4 of Volume I and summarized in Section 2.18, indicate that implementation of any of the proposed activities would not have a major impact on any of the candidate sites. To avoid contamination that has occurred in the past at some DOE sites, DOE would design, build, and operate the proposed surplus plutonium disposition facilities in compliance with today's environmental, safety and health requirements.

MR009–4 **MOX Approach**

Recent reports prepared by the French Government have concluded that the radioactive releases from the La Hague Plant are not the cause of an excess of childhood leukemia in the area of the plant between 1978 and 1996. The La Hague Plant is a spent fuel reprocessing plant. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle.

European reactors of various designs use MOX fuel. European nuclear regulatory authorities have reviewed MOX fuel use in reactors of varying designs and found it to be safe and acceptable.

Use of MOX fuel in domestic, commercial reactors is not proposed in order to advocate a plutonium economy. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

MR009–5 **MOX Approach**

Reactor fuel in Europe is fabricated to similar enrichment levels (about 5 percent plutonium 239) to the levels being proposed for the U.S. reactors that would be used to irradiate MOX fuel.

On the basis of public comments received on the SPD Draft EIS, and the analysis performed as part of the MOX procurement, DOE has included plutonium polishing as a component of the MOX facility to ensure adequate impurity removal (including gallium) from the plutonium dioxide. Appendix N was deleted from the SPD Final EIS, and the impacts discussed therein were added to the impacts sections presented for the MOX facility in Chapter 4 of Volume I. Section 2.18.3 was also revised to include the impacts associated with plutonium polishing.

MR009–6 **Nonproliferation**

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials.

Russia may choose to reprocess its spent fuel and reuse the plutonium. It will be the responsibility of IAEA to monitor this activity and ensure that the material remains committed to civilian use. Programmatic and policy issues such as U.S. policies toward plutonium disposition in Russia are beyond the scope of this SPD EIS.

POE, W. LEE, JR.
PAGE 1 OF 1

807 E. Rollingwood Rd.
Aiken, SC 29801
June 15, 1999

Mr. G. Bert Stevens
Department of Energy **FAX 1-800-820-5156**
Office of Fissile Materials Disposition, MD-4
Forrestal Building
1000 Independence Avenue, SW
Washington, DC 20585

CC: Mr. Greg Rudy, Manager **FAX 725-1910**
Savannah River Operations Office

Mr. Andrew Granger, SR NEPA Compliance Officer **FAX 725-4023**
Savannah River Operations Office

Ms. Mary Flora, WSRC Manager of Public Involvement **FAX 725-4023**
Westinghouse Savannah River Company

Re: Public Meeting on Supplement for Surplus Plutonium EIS

Dear Sir:

I have heard of no public meeting being scheduled on the supplementental EIS for surplus plutonium management in the Aiken Augusta area. I am disappointed that you do not consider the stakeholders in the Savannah River Site from South Carolina-Georgia important to this mission. I suggest that you reconsider and hold a meeting on this subject in this area.

I do not understand the intent of the meeting from your "Second Notice" announcement but Savannah River Site seems to be important to this mission so I expect your Office to keep the SRS stakeholders up to date on these issues. It is clear to me that we, stakeholders, are important to that mission. Keep us up to date on the Office of Fissile Materials plans. 1

If you are unable to hold a public meeting on these plans in the Aiken-Augusta area, what strategy do you have for informing the SRS stakeholders?

Sincerely
W. Lee Poe
W. Lee Poe, Jr.

FR002

FR002–1 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's request for a public hearing on the *Supplement to the SPD Draft EIS* be held in the Aiken-Augusta area. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

Since the inception of the U.S. fissile materials disposition program, DOE has supported a vigorous public participation policy. SRS stakeholders who are in the MD stakeholder database will be kept directly informed of the progress on the surplus plutonium disposition program through notices and announcements sent by mail. Indirectly, interested parties may get information from the MD Web at http://www.doe-md.com, the DOE reading rooms, and local and site media announcements.

SOUTH CAROLINA SENATE
HONORABLE PHIL P. LEVENTIS
PAGE 1 OF 1

SENATOR PHIL P. LEVENTIS
SUMTER COUNTY

OFFICES
404 GRESSETTE BUILDING
P. O. BOX 142
COLUMBIA, SOUTH CAROLINA 29202
PHONE (803) 212-6230
FAX (803) 212-6299

P. O. BOX 1592
SUMTER, SOUTH CAROLINA 29151-1592
(803) 773-0884

THE SENATE OF SOUTH CAROLINA

COMMITTEES:
AGRICULTURE AND NATURAL RESOURCES,
CHAIRMAN
FINANCE
LABOR, COMMERCE & INDUSTRY
TRANSPORTATION
ETHICS
MEDICAL AFFAIRS

June 30, 1999

The Honorable Bill Richardson
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20582

Dear Secretary Richardson:

I want to say thank you again for your willingness to participate in the public hearing that I held on Thursday, June 24, 1999, in Columbia, South Carolina. The advertising that your Department sponsored on the radio and in the newspaper ensured that at least one hundred or more interested individuals had the opportunity to hear directly from the Department of Energy regarding the proposed Mixed Oxide Fuel Program. I was very appreciative of the number of DOE officials who participated and traveled from such distances as Argonne, Illinois, Washington, D.C., Charlotte, North Carolina, as well as Aiken, South Carolina. Flying Mr. Denis Hugelmann from France to discuss Cogema's expertise and role in the consortium was also most helpful and very important. This effort on your part has not gone unnoticed. I along with others who assisted in my organizing this public hearing were impressed with the Department's assistance in making the hearing a success. The Department demonstrated a true interest in trying to reach out to the public by candidly responding to the series of questions that I asked at the beginning of the hearing and by patiently listening to the questions and concerns raised by the public on the proposed MOX program. 1

I have spoken to your Principal Deputy Assistant Secretary, Ms. Linda Lingle, and have conveyed my thanks to her and all that she did to make the hearing a success. However, I want to be sure that you understand the depth of my appreciation. I look forward to continuing a dialogue with you and your Department on his matter.

Sincerely,

Phil P. Leventis

PPL:pap
cc: The Honorable James H. Hodges
SC Congressional Delegation
Ms. Linda Lingle, USDOE
Mr. Bert Stevenson, USDOE
Ms. Laura Holgate, USDOE
Mr. David Nulton, USDOE
Mr. Charlie Anderson, USDOE
Mr. Robert C. Selby, USDOE
Mr. R.H. Ihde, Duke, Cogema, Stone & Webster Consortium
Mr. Denis Hugelmann, Cogema
Dr. Arjun Makhijani, IEER
Mr. Ethan Brown, Carolina Peace Resource Center

\chair\richardsonthankyou63099.doc

MR025

MR025–1 **General SPD EIS and NEPA Process**

DOE acknowledges the Senator's appreciation of its efforts in supporting the public meeting held on June 24, 1999, in Columbia, South Carolina. Since the inception of the fissile materials disposition program, DOE has supported a vigorous public participation policy.

Tennessee Department of Environment and Conservation
Earl C. Leming
Page 1 of 1

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DOE OVERSIGHT DIVISION
761 EMORY VALLEY ROAD
OAK RIDGE, TENNESSEE 37830-7072

May 26, 1999

DOE, Office of Fissile Materials Disposition
c/o Supplement to the SPD EIS
PO Box 23786
Washington DC 2006-3786

Dear Sirs

DOCUMENT REVIEW: Supplemental to the Draft Environmental Impact Statement, *"Surplus Plutonium Disposition,"* DOE/EIS-0283-D, July 1998

The Tennessee Department of Environment and Conservation, DOE Oversight Division (TDEC/DOE-O) has reviewed the above Supplemental Draft Environmental Impact Statement (EIS) and has the following comment.

The Department wishes to again note that there are quantities of plutonium in the form of TRU waste, contaminated equipment, spent fuel, and working inventory still present on the Oak Ridge Reservation. Although not considered surplus, this plutonium will require final disposition and should to be addressed by DOE in the near future. 1
In addition, project plans should ensure that post irradiation examination of MOX fuel at the Oak Ridge National Laboratory does not contribute to the Oak Ridge Reservation waste inventory. 2

Sincerely

Earl C. Leming
Director

xc: Justin Wilson – Governor's Policy Office
Jim Hall – DOE
Ed Cumesty - DOE
Dodd Galbreath – TDEC

EI460.99

MR006

MR006–1 **Other**

Most of the plutonium stored at ORR is in the form of waste. Approximately 600 g (21 oz) of plutonium 238 (not weapons-usable) has been declared excess and is being held in storage at ORNL awaiting transfer for use in the space program. Approximately 780 g (28 oz) of other plutonium isotopes have been repackaged and are awaiting transfer to LLNL. The scope of this SPD EIS includes alternatives for the disposition of weapons-usable plutonium declared surplus to U.S. defense needs. Other radioactive materials, wastes and spent nuclear fuel that contain plutonium are beyond the scope of this SPD EIS. Alternatives for management of radioactive and hazardous wastes were evaluated in the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200-F, May 1997). RODs for TRU, hazardous and high-level waste have been issued; RODs for low-level and mixed low-level waste are expected shortly. Alternatives for management of spent nuclear fuel were evaluated in the *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final EIS* (DOE/EIS-0203-F, April 1995). RODs for this EIS were issued in May 1995, and March 1996. Transportation and disposal of TRU waste are evaluated in the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997). A ROD for the WIPP EIS was issued in January 1998. Transportation and disposal of spent nuclear fuel are evaluated in the *Draft EIS for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999). A ROD has not been issued for the *Yucca Mountain EIS*.

MR006–2 **Waste Management**

As discussed in the revised Section 1.6, DOE prefers ORNL for postirradiation examination activities. ORNL has the existing facilities and staff expertise needed to perform postirradiation examination as a matter of its routine activities; no major modifications to facilities or processing capabilities would be required. In addition, ORNL is about 500 km (300 mi) from the reactor site that would irradiate the fuel. Section 4.27 was revised to include analyses of potential waste management impacts at ORNL.

STAND

June 24, 1999
STAND COMMENT # S-2

Office of Fissile Materials Management
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Dear Department of Energy, Office of Fissile Materials Management:

These are STAND's (Serious Texans Against Nuclear Dumping) second comments on the *Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement*, April 1999. Most of the supplemental analysis is based upon the proposal submitted by the Duke Cogema Stone and Webster consortium.

1. MOX fuel fabrication is more dangerous

When compared to the consortium's analysis, DOE's previous analyses underestimated hazards and overstated benefits from a MOX fuel fabrication plant. For example: 1

DOE's estimated annual volume of liquid radioactive waste at MOX plant .... 1 liter

Nuclear industry's estimated annual volume of liquid radwaste at MOX plant .... 800 liters

DOE's estimate of radionuclide emissions in MOX plant wastewater .... None

Nuclear Industry's estimate .... 9,250 Bequerels

Percentage DOE underestimated the electrical requirements of a MOX plant 72%

Percentage DOE underestimated the natural gas requirements of a MOX plant 16%

Percentage DOE underestimated the water requirements of a MOX plant 55%

Percentage DOE overestimated the number of jobs at a MOX plant 13%

Number of months DOE refused to evaluate liquid acid plutonium processing--or plutonium "polishing"--as a reasonable alternative for plutonium conversion 35

Number of months after the MOX Industry Conference in Atlanta that it took for DOE to respond to Industry demands and develop Appendix N for a Plutonium Polishing option 2

Serious Texans Against Nuclear Dumping
7105 W 34th Ave, Suite E, Amarillo, TX 79109-2907
phone (806)358-2622 - fax (806)355-3837 - email <stand@arn.net>

FR009

FR009–1 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

While it is true that some of the estimates in the SPD Draft EIS have increased as noted by the commentor, other estimates have decreased such as the number of workers required to operate the MOX facility and the worker dose estimate. While some estimates have increased, none of the increases are expected to result in major environmental impacts to the public during normal operations at any of the candidate sites as shown in Section 2.18 and Chapter 4 of Volume I.

On the basis of public comments received on the SPD Draft EIS, and the analysis performed as part of the MOX procurement, DOE has included plutonium polishing as a component of the MOX facility to ensure adequate impurity removal from the plutonium dioxide. Appendix N was deleted from the SPD Final EIS, and the impacts discussed therein were added to the impacts sections presented for the MOX facility in Chapter 4 of Volume I. Section 2.18.3 was also revised to include the impacts associated with plutonium polishing.

Section 4.28 was revised to discuss the potential environmental impacts of operating Catawba, McGuire, and North Anna, the reactors that would use the MOX fuel. These reactors were selected in part because their operational lives would not have to be extended to support the surplus plutonium disposition program.

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial

STAND OF AMARILLO, INC.
DON MONIAK
PAGE 2 OF 2

2. Putting MOX in old nuclear reactors is a bad idea:

Age of Nuclear Reactors when first MOX fuel scheduled to be inserted . . . . 20 to 28 years

Age of Nuclear Reactors in 2020 when MOX fuel scheduled to leave . . . . 24 to 32 years

Number of extra spent fuel assemblies expected from MOX 199 1

Percentage DOE underestimated maximum radiation dose to people near reactors: . . . 82-329%

These comments will be supplemented in the future.

Sincerely:

Don Moniak
Program Director
STAND, Inc.

FR009

reactors. However, spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies.

As discussed in Section 4.28.2.4, the radiation dose to the population in the vicinity of the proposed reactor sites is not expected to change from normal operation of the reactors with a partial MOX fuel core instead of a full LEU fuel core. The commentor states that DOE "underestimated maximum radiation dose to people near reactors" but it is impossible to determine how this was derived. The *Storage and Disposition PEIS* presented information on a generic reactor but this is not directly comparable to the specific reactor information presented in this SPD EIS.

STAND

June 24, 1999
STAND COMMENT # S-1

Office of Fissile Materials Management
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Dear Department of Energy, Office of Fissile Materials Management:

These are STAND's (Serious Texans Against Nuclear Dumping) first comments on the April 1999 *Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement.*

Subject: Pit Repackaging requirements, Page 9.

The Department of Energy argues that the need to repackage 12,000 plutonium pits into shipping containers can be avoided if plutonium pit disassembly and conversion were conducted at Pantex. The Department implicitly alleges that the benefit of siting a pit processing facility at Pantex would be lower radiation exposures to Pantex.

Fundamental Flaws in DOE's Analysis

1. There are approximately 12,000 plutonium pits at Pantex that are stored in unsuitable AL-R8 containers. Up to 4,000 of these pits are:

- considered "National Assets;"
- not part of the surplus pit inventory;
- scheduled to be stored indefinitely at Pantex in Building 12-116.

The impact of packaging these "National Assets" is entirely separate from the impact of packaging surplus plutonium pits and DOE should make this adjustment. 1

2. The decision by DOE to abandon its efforts–after spending $50,000,000–to repackage pits in AT-400A storage/shipping containers represents inadequacies in Pantex's plutonium pit handling and storage operations. Prior to late 1997 there were no indications that the AT-400A was a problematic container and Pantex's public relations efforts praised the container as a great achievement, a "win-win" situation. In fact, the AT-400A is still identified as the container of the future in the DOE-funded Amarillo International Airport plutonium exhibit and in the storage storage section at http://www.pantex.com.

In this supplemental analysis, as with the Draft SPDEIS, the Department is actually rewarding Pantex for its failure to implement promised safety improvements. If Pantex were to proceed with using the AT-400A there would be no need to repackage pits into shipping containers. Pantex's

Serious Texans Against Nuclear Dumping
7105 W 34th Ave, Suite E, Amarillo, TX 79109-2907
phone (806)358-2622 - fax (806)355-3837 - email <stand@arn.net>

FR008

FR008–1 **Alternatives**

DOE acknowledges the commentor's concern regarding the storage of plutonium pits at Pantex. DOE is committed to the safe, secure storage of pits and is evaluating options for upgrades to Pantex Zone 4 facilities to address plutonium storage requirements. DOE has addressed some of the commentor's concerns in an environmental review concerning the repackaging of Pantex pits into a more robust container. This evaluation is documented in the *Supplement Analysis for: Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components—AL–R8 Sealed Insert Container* (August 1998). This document is on the MD Web site at http://www.doe-md.com. Based on this supplement analysis, the decision was made to repackage pits at Pantex into the AL–R8 sealed insert container and to discontinue plans to repackage pits into the AT–400A container.

Worker exposure estimates attributable to the decision to repackage pits in AL–R8 sealed insert containers were incorporated in the revised Section 2.18 and Appendix L.5.1.

The issues raised in this comment relate to pit storage decisions made in the *Storage and Disposition PEIS* and the *Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components* (DOE/EIS-0225, November 1996). DOE is considering leaving the repackaged surplus pits in Zone 4 at Pantex for long-term storage. An appropriate environmental review will be conducted when the specific proposal for this change has been developed; addressing, for example, whether additional magazines need to be air-conditioned. The analysis in this SPD EIS assumes that the surplus pits are stored in Zone 12 in accordance with the ROD for the *Storage and Disposition PEIS*.

STAND OF AMARILLO, INC.
DON MONIAK
PAGE 2 OF 2

decision to abandon this costly program functions to serve its efforts to keep the pits and become a plutonium processor.

3. The argument that worker exposures can be reduced if pits do not need repackaging is not balanced by the fact that worker exposures during secondary canning of plutonium powder (which would be unnecessary in co-located facilities) would be much higher than exposures during pit repackaging. Furthermore, workers at Pantex would be far more likely to suffer internal exposure to plutonium in a plutonium pit processing facility. 1

4. The argument made by DOE mirrors that made by Mr. Carl Beard, Nuclear Program Manager for the Amarillo National Resource Center for Plutonium (ANRCP). In comments on the Draft Surplus Plutonium Disposition EIS, Mr. Beard stated that, "if conversion is not done at Pantex, all the pits would have to be repackaged into AT400 (or some other approved transportation container) and shipped to SRS. This will not have to be done if the facilities are located at Pantex. The EIS estimates a 40% dose reduction to Pantex workers due to this. Were ALARA considerations evaluated as part of this process?" 2

Of course, Mr. Beard and the ANRCP have never raised any ALARA concerns when plutonium pits were unnecessarily shipped from Rocky Flats, and when the Department chose the more complicated MOX fuel option.

These comments will be supplemented in the future.

Sincerely:

Don Moniak
Program Director
STAND, Inc.

FR008

FR008–2 **Human Health Risk**

There would be reduced doses to Pantex workers involved with repackaging pits for shipment to other sites if the pit conversion facility were located at Pantex. There may be some overall advantage in terms of human health risk if the pit conversion facility is collocated with the other surplus plutonium disposition facilities. The SPD EIS presents a conservative estimate of the worker dose associated with operating these facilities. DOE is committed to reducing any human health risks at its sites to ALARA levels. The surplus plutonium disposition facilities would be designed, constructed, and operated to achieve these goals.

Pits were shipped from RFETS to Pantex to support activities DOE felt were necessary at RFETS. The MOX approach is a reasonable alternative because it is an effective way to accomplish the goal of the surplus plutonium disposition program. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors would reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Section 4.28 was revised to discuss the potential environmental impacts of operating the reactors that would use the MOX fuel, should the decision be made to proceed with the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

STAND OF AMARILLO, INC.
DON MONIAK
PAGE 1 OF 3

STAND

June 28, 1999
STAND COMMENT # S-3

Office of Fissile Materials Management
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Dear Department of Energy, Office of Fissile Materials Management:

These are STAND's (Serious Texans Against Nuclear Dumping) third set of comments on the April 1999 *Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement.* (SPDEIS)

Subject: Lead Test Assemblies, Uranium Feed, and Bad MOX Fuel

In the final SPDEIS, STAND is requesting that DOE:

- Clearly identify all major differences between weapons-grade and reactor-grade plutonium; 1
- Identify and explain the lack of progress in the MOX fuel test program at Los Alamos; 2
- Analyze the environmental, safety, and health impacts of producing uranium oxide powder for MOX that is derived from the "Ammonium Uranyl Carbonate" (AUC) process 3
- Analyze the option of having Los Alamos or other DOE entities produce off-spec MOX fuel as an alternative immobilization route for plutonium pits. 4

Background for Request

A March 1999 Los Alamos National Laboratory (LANL) report[1] calls into question the ability of the lab to successfully fabricate Mixed Oxide (MOX) test fuel using weapons-grade plutonium. At the root of the problem is that "weapons-grade plutonium morphology (shape) differs significantly than that of reactor-grade plutonium." These fundamental differences must be clearly identified in the final SPDEIS. 2

Los Alamos is the lead laboratory for the MOX fuel fabrication program while Oak Ridge National Laboratory is the lead lab for irradiating the fuel made at LANL and "post-irradiation" exams of that fuel, barring major accidents. The Department of Energy's goal was to begin conducting a "High Power Test" of MOX fuel pellets during April, 1999 in the "Advanced Test Reactor" (ATR) at INEEL.[2]

[1] LA-UR-99-1533. *Nuclear fuels technologies status report on feed materials baseline development and test fuel fabrication progress.* H. T. Blair, P. Chodak, S. L. Eaton, and A. D. Neuman. Los Alamos National Laboratory March, 1999.

[2] *FY 1999 Annual Operating Plan.* (Rev 0, October 1, 1998). DOE Office of Fissile Materials Disposition.

Serious Texans Against Nuclear Dumping
7105 W 34th Ave, Suite E, Amarillo, TX 79109-2907
phone (806)358-2622 - fax (806)355-3837 - email <stand@arn.net>

FR006

FR006–1 **MOX Approach**

The major difference between weapons-grade plutonium and reactor-grade plutonium (i.e., plutonium recovered from spent nuclear fuel) is the level of plutonium 239. The level of plutonium 239 is lower in reactor grade plutonium. DOE recognizes that European MOX programs use different enrichment levels. However, European enrichment levels are more tied to programmatic needs and not to specific limits on plutonium 239. The plutonium 239 levels being proposed in this EIS may be higher than those in Europe but are still considered safe. If any specific safety limits or restrictions are required, they would be identified by NRC during the license amendment process.

FR006–2 **MOX Approach**

The plutonium dioxide feed to the MOX facility would be calcined, oxalate-derived material that would have morphology identical to that of the oxide used successfully in Europe to make MOX fuel.

Fuel fabrication R&D at LANL was sponsored in order to fabricate test fuel for irradiation in the Advanced Test Reactor at INEEL. Fuel for the first irradiation test was fabricated successfully. The second irradiation test was canceled based on technical input from DCS, the team that was selected to fabricate MOX fuel and irradiate it. Fuel R&D continues at LANL because further developing a domestic MOX fuel fabrication capability is useful to DOE for lead assembly fabrication and for other programmatic purposes, especially related to characterizing the feed powder from the pit conversion facility.

The difficulties encountered with fabrication of MOX test fuel at LANL are due neither to the lack of MOX fuel fabrication capability at LANL nor to generic technical difficulties associated with weapons-grade plutonium. These difficulties have been determined to be primarily due to switching the uranium oxide used in the MOX test fuel. LANL had successfully fabricated MOX test fuel for the first irradiation test using an uranium oxide commercially supplied by CAMECO. To begin fabrication of the MOX test fuel for the second irradiation test, uranium oxide from the ammonium uranyl carbonate process was used and it proved to be a problem.

STAND OF AMARILLO, INC.
DON MONIAK
PAGE 2 OF 3

In the past two years alone, the Department of Energy has allocated $3.425 million for MOX fuel fabrication research and development work at Los Alamos, and another $10.075 million on the program to irradiate the test pellets in the Advanced Test Reactor[3] (3). To date, fourteen batches of MOX test fuel pellets for this project have failed to meet technical specification and/or had some or all of the following unacceptable problems:

–"end capping"
--cracking on top
--bubbling when submerged in alcohol

These dismal results involved plutonium oxide powder produced from both dry (pyroprocessing) and wet (liquid acid) plutonium metal-to-oxide conversion processes. While the authors complained of running low on plutonium made from DOE's preferred conversion alternative called HYDOX, they failed to mention that in 1998 HYDOX was "retracted from the ARIES line by NMT-DO for safety reasons."[4] 2

In the final SPDEIS, DOE should identify the lack of progress in its MOX fuel test program and explain how spending millions of dollars on future efforts is justified. While Los Alamos plutonium programs–HYDOX, MOX, TIGR–continue to encounter delays and failures, the lab remains the Department's "preferred alternative" to fabricate MOX "Lead Test Assemblies" for use in commercial reactors. DOE should answer whether failure in the Los Alamos R&D projects are a function of site-specific incompetency or generic technical difficulty associated with weapons-grade plutonium.

The latest results at LANL involve MOX test fuel using uranium oxide powder derived from the "Ammonium Uranyl Carbonate" (AUC) process--the same process that has supplied uranium oxide for more than 90% of the world's supply of commercial MOX fuel. Since making MOX fuel for Light Water Nuclear Reactors generally involves a mix of 3-5% plutonium oxide powder and 95-97% uranium oxide powder, it is obvious that the uranium must be compatible with the plutonium. In the final SPDEIS, DOE must analyze the environmental, safety, and health impacts of uranium oxide powder production using the Ammonium Uranyl Carbonate process. 3

Given the fact that DOE's MOX program is having severe difficulties in the test phase, STAND requests that the option of immobilizing plutonium in "bad" MOX fuel be analyzed in the final SPDEIS. The disposition of excess plutonium using "off-spec" MOX pellets as a final immobilization waste form was raised in 1996 by G.A. Armantrout and L.J. Jardine.[5] 4

[3]FYs 1998 (Rev. 8) and 1999 (Rev. 0) *Annual Operating Plans*. DOE Office of Fissile Materials.

[4]September 28, 1998 Memorandum from U.S. DOE-Los Alamos Area Office to Bruce Matthews, Division Director, NMT-DO, LANL, MS-E500. *Approval of ARIES Project Hazard Analyses and Required Safety Controls*. Attachment 1. Page 10.

[5] Armantrout, G.A. and L.J. Jardine. *Disposition of Excess Plutonium Using "Off-Spec" MOX Pellets as a Sintered Ceramic Waste Form*. UCRL-JC-121830. Lawrence Livermore National Laboratory.

FR006

FR006–3 **MOX Approach**

Section 4.30.3 was added to this SPD EIS to evaluate the environmental impacts of converting depleted uranium hexafluoride to depleted uranium dioxide using a commercially available dry conversion process. As described in the *Initial Data Report in Response to the SPD EIS Data Call for the UO_2 Supply* (ORNL/TM-13466, November 1997), dry conversion is a proven technology for uranium dioxide production that is currently available at four domestic commercial fuel production facilities. The dry conversion process is a more efficient process than the ammonium diuranate wet conversion process and as indicated by the commentor, the wet process has proven to be more problematic in ongoing experiments at LANL.

FR006–4 **Alternatives**

Off-specification MOX fuel pellets would not normally be sent to the immobilization facility. As described in Section 2.4.3.2, MOX fuel pellets that do not meet specifications would be recycled in the MOX process line. Section 4.30 discusses the incremental impacts that would be expected if plutonium originally designated for MOX fuel (such as rejected MOX fuel) had to be immobilized instead.

STAND of Amarillo, Inc.
Don Moniak
Page 3 of 3

Los Alamos has a proven ability to make off-spec MOX fuel pellets, and the technology for MOX fuel fabrication is highly advanced. DOE should consider a long-term strategy of immobilizing the plutonium found in pits in off-spec MOX fuel pellets. 4

These comments will be supplemented in the future.

Sincerely;

Don Moniak
Program Director
STAND of Amarillo, Inc.

FR006

Please include in the Public Record

JUNE 23,1999

TO: USDOE, OFFICE OF FISSILE MATERIALS DISPOSITION ,PO BOX 23786, Washington, DC 20026-3786

FROM: Tim Young and MB Condon, 380 Ilsa Way, Goldendale WA 98620
(509) 773-6991

RE: Supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement

We would like to express the following concerns to USDOE regarding the supplement to the Draft Surplus Plutonium Disposition EIS.

It is very disturbing that USDOE has gone forward with contracts with Duke Power and Virginia Power to utilize MOX fuel in commercial reactors before the Final Surplus Plutonium Disposition Environmental Impact Statement has been issued. It is even more disturbing that the only public meetings on this issue were held in Washington,DC, not in the communities where the MOX fuel will be shipped and burned . The people within the reactor communities and those along the shipping routes must be directly involved in USDOE's decisions that could increase the possibility of a nuclear accident and consequently increase the number of cancer deaths in their communities were such an accident to occur during the use of MOX fuels. 1

As residents of Washington State ,who have been to many public meetings regarding Hanford, we would contend that USDOE's lack of outreach in this instance is par for the course . It only serves to reinforce the conception that USDOE acts unilaterally , when there may be public oppossition to it's goals .

USDOE should extend the public comment period on this Supplemental EIS and hold public hearings in the reactor communities that will be affected by contracts with Duke Power and Virginia Power. These meetings should be publicized prominently in the affected communities and held at hours that are convenient for working people to attend.

Tim Young and MB Condon

Tim Young
MB Condon

FR012

FR012–1 **General SPD EIS and NEPA Process**

DOE conducted a procurement process in accordance with DOE NEPA regulations 10 CFR 1021.216. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. As stipulated in DOE's phased contract with DCS, until and depending on the decisions regarding facility siting and approach to surplus plutonium disposition are made and announced in the SPD EIS ROD, no substantive design work or construction can be started by DCS on the MOX facility. Should DOE decide to pursue the No Action Alternative or the immobilization-only approach, the contract with DCS would end. The contract is phased so that only nonsite-specific base contract studies and plans can be completed before the ROD is issued, and options that would allow construction and other work would be exercised by DOE if, and only if, the decision is made to pursue the MOX approach.

DOE acknowledges the commentors' request for additional public hearings in areas affected by the use of MOX fuel and an extension of the public comment period, including the reactor and shipping route communities. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS* or to extend the public comment period. The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

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DOE provided other means and time for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. At the invitation of South Carolina State Senator Phil Leventis, DOE also attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina.

Although it did not extend the comment period, DOE did consider all comments received after the close of that period for the *Supplement*. All comments were given equal consideration and responded to as presented in Volume III, Chapter 4.

Alliance for Nuclear Accountability
Brad Morse
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Statement of Brad Morse
Program Assistant
Alliance for Nuclear Accountability
June 15 Public Hearing on the Supplement to the Draft Surplus Disposition EIS
Morning Session

The Alliance for Nuclear Accountability is a network of organizations concerned with nuclear weapons, nuclear waste, materials disposition, and public health. ANA members are by and large community groups living in the shadows of the Department of Energy nuclear weapons complex.

ANA member organizations have a lifetime of experience with the legacy of fifty years of Cold War policy and production. It is with that experience that the 27 member organizations of the Alliance for Nuclear Accountability join with the over one hundred other organizations and individuals from more than a dozen countries in opposition to the 1
use of weapons-grade plutonium as MOX fuel in commercial reactors. When that Pandora's Box of Plutonium is opened, we will be hard pressed to close it.

COMMENTS AND QUESTIONS ON THE SUPPLEMENT

I wanted to open with one question of some detail, and I hope I can have it answered today. On page 8 of Appendix P of the Supplement, table 6 indicates that the SPD Draft EIS estimated annual waste generation of .5 liters/year of liquid TRU waste, and .3 liters/year of liquid low level waste. The offeror estimated 500 liters/year of liquid TRU waste, and 300 liters/year of liquid low level waste. I don't want to be trivial right away,
but is it the position of DOE that it was 1000% off in estimating annual waste generation. 2
I ask this not as much out of concern of the total annual waste generated, but out of concern for where else an error of this magnitude may have occurred and its consequences. When that Pandora's Box of Plutonium is opened, we will be hard pressed to close it.

Question #1: What is the source of this error and has it been corrected?

The DOE and its predecessor agencies have a reputation for secrecy and a lack of meaningful public input. While the DOE has made strides in the right direction in recent years, the public process around the MOX proposal is shameful. Throughout the public process associated with the Draft Surplus Plutonium Disposition EIS, we in the NGO community were told time and again that the DOE couldn't possibly hold hearings in communities around nuclear reactors that were candidates for the MOX program, until the DOE knew which reactors were selected. Now we know the Catawba, McGwire, and
North Anna reactors have been chose, and still the DOE declines to hold hearings in 3
those communities. It is my most sincere hope that DOE reconsiders this decision, and does give communities which could endure decades of plutonium shipments in and out, and which assume the risk of a plutonium accident, the chance to voice their opinion. And how is it that we know which reactors will irradiate MOX fuel, without having yet completed the Environmental Impact Statement? The Department of Energy has done a discredit to itself and the public by its rush to judgement, and it has violated at least the spirit of NEPA.

Question #2: Doesn't the awarding of a MOX contract pre-determine the hybrid approach and the use of MOX?

DCR012

DCR012–1 **MOX Approach**

DOE acknowledges the commentor's opposition to the use of weapons-grade plutonium in MOX fuel and irradiating it in commercial reactors. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

DCR012–2 **Waste Management**

Initial estimates provided in support of the MOX data report indicated that liquid TRU waste generation would be on the order of 0.5 l/yr (0.1 gal/yr) and liquid LLW generation would be approximately 0.3 l/yr (0.08 gal/yr). As part of the request for proposals for the MOX fuel fabrication and irradiation contract, DOE asked prospective offerors to review the projected resource requirements and waste estimates included in the SPD Draft EIS to determine if they considered them reasonable for the proposed MOX facility. DCS stated that overall the waste estimates were consistent with their experience, but they noted that the liquid radioactive waste estimates appeared low and probably should be on the order of m^3/yr instead of l/yr. Thus, the estimates were increased to 500 l/yr (132 gal/yr) and 300 l/yr (79 gal/yr), equivalent to 0.5 m^3/yr (0.6 yd^3/yr) and 0.3 m^3/yr (0.4 yd^3/yr).

Although the waste generation estimates were increased by a factor of 1000, they are still very small. For example, 300 l/yr (79 gal/yr) would fill approximately one and a half (208-l [55-gal]) drums. As described in Chapter 3 of Volume I, the F- and H-Area Effluent Treatment Facility at SRS can process 1.9 million m^3/yr (2.5 million yd^3/yr) which is equivalent to 1.9 billion l/yr (0.5 billion gal/yr) of liquid LLW. Therefore, 300 l/yr (79 gal/yr) of additional liquid LLW would be a very small portion of the waste that could be processed in the F- and H-Area Effluent Treatment Facility.

In other cases, DCS reported that their estimates were lower than those presented in the SPD Draft EIS. For example, DCS estimated that fewer workers would be needed to operate the MOX facility and thus the average worker dose would be much lower.

DCR012–3 **General SPD EIS and NEPA Process**

Since the inception of the fissile materials disposition program, DOE has supported a vigorous public participation policy. It has conducted public hearings in excess of the minimum required by NEPA regulations to engender a high level of open and public dialogue on the program. The office has also provided the public with substantial information in the form of fact sheets, reports, exhibits, visual aids, and videos related to fissile materials disposition issues. It hosts frequent workshops, and senior staff members make presentations to local and national civic and social organizations on request. For example, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in the public hearing that was held in Columbia, South Carolina, on June 24, 1999. Additionally, various means of communication—mail, a toll-free telephone and fax line, and a Web site (http://www.doe-md.com)—have been provided to facilitate the public dialogue. It is DOE policy to encourage public input into these matters of national and international importance.

DOE acknowledges the commentor's request that DOE hold public hearings in the communities near the potential reactor sites that would use the MOX fuel. During the 45-day public comment period on the *Supplement to the SPD Draft EIS*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement*. DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

DOE conducted a procurement process in accordance with DOE NEPA regulations 10 CFR 1021.216. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. As stipulated in DOE's phased contract with DCS, until and depending on the decisions regarding facility siting and approach to surplus plutonium disposition are made and announced in the SPD EIS ROD, no substantive design work or construction can be started by DCS on the MOX facility. Should DOE decide to pursue the No Action Alternative or the immobilization-only approach, the contract with DCS would end. The contract is phased so that only nonsite-specific base contract studies and plans can be completed before the ROD is issued, and options that would allow construction and other work would be exercised by DOE if, and only if, the decision is made to pursue the MOX approach.

ALLIANCE FOR NUCLEAR ACCOUNTABILITY
BRAD MORSE
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Question #3: Knowing the nuclear fuel cycle creates more reactor-grade plutonium, and looking at footnote #1 on page 3 "Weapons-grade, fuel-grade, and power-reactor-grade plutonium are all weapons usable."; how do you reconcile the goal of the MOX project of eliminating or reducing weapons-usable plutonium with the fact that MOX irradiation actually creates plutonium? 4

Question #4: At a public meeting at the Nuclear Regulatory Commission, I asked the consortium about the public's ability to gain access to environmental safety & health records from Europe, based on the notion that the US MOX program would heavily depend on the European experience with reactor-grade plutonium. I was told "we haven't asked them, and we don't need them" referring to the environmental records. Based on comments today, I assume that the consortium will indeed be looking at those records. Could I get a formal response to that question? 5

DCR012

DCR012–4 **MOX Approach**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this.

It is true that in the MOX approach only a fraction of the plutonium would actually be consumed in the reactor; but the remainder would be an integral part of massive spent fuel assemblies. The spent fuel assemblies would be so large and radioactive that any attempted theft of the material would require a dedicated team willing to suffer large doses of radiation, along with substantial equipment for accessing and removing the spent fuel from the storage facility and carrying it away.

Reactor-grade plutonium can be made into a nuclear weapon but it presents would be users with much greater difficulties than weapons-grade plutonium. The level of reactor-grade plutonium in MOX spent fuel would be higher than that present in LEU spent fuel but it would still be a very small percentage of the remaining fuel and be highly radioactive. In order for it to be used in a nuclear weapon, the fuel would have to be reprocessed. This is an operation that is very difficult to conceal.

DCR012–5 **MOX RFP**

DOE considered past environmental performance of COGEMA in awarding the contract for MOX fuel fabrication and irradiation services. The operating experience at MELOX is being factored into the MOX facility design and was used to update information in the SPD Final EIS as discussed in Appendix P. More information on COGEMA's environmental record can be found on their Web site at http://www.cogema.com or by contacting Ms. Christi A. Byerly. Her address is: 7401 Wisconsin Avenue; Bethesda, MD 20814. She may also be contacted by telephone at (301) 941-8367. Her fax number is (301) 652-5690, and her email address is cbyerly@cogema-inc.com.

ALLIANCE FOR NUCLEAR ACCOUNTABILITY * CAROLINA PEACE RESOURCE CENTER * NUCLEAR CONTROL INSTITUTE * PHYSICIANS FOR SOCIAL RESPONSIBILITY * SAFE ENERGY COMMUNICATION COUNCIL * SERIOUS TEXANS AGAINST NUCLEAR DUMPING * UNION OF CONCERNED SCIENTISTS * U.S. PUBLIC INTEREST RESEARCH GROUP

April 21, 1999

The Honorable Bill Richardson
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue SW
Washington, DC 20585

Dear Secretary Richardson:

We are writing to express our strong objections to one important aspect of the Department of Energy's plans to release a supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement ("draft EIS"). [64 *Federal Register* 16720, April 6, 1999]

We agree that DOE is required under NEPA to prepare a supplement to the draft EIS in order to provide more information on "the potential environmental impacts of using mixed oxide (MOX) fuel in six specific commercial nuclear power reactors at three sites..." in Virginia, North Carolina, and South Carolina. We find it unacceptable, however, that DOE plans only one public hearing on these issues, to be held in Washington, DC.

When the draft EIS was released last summer, some of us objected to the lack of plans to hold hearings in the communities around reactors that would irradiate weapons-plutonium MOX. At that time, we were informed by representatives of the Office of Fissile Materials Disposition (MD) that local hearings in reactor communities could not be scheduled because the MOX procurement process was still underway, and reactor sites had not yet been selected. After DOE's contract award on March 22, 1999, this is clearly no longer the case. The consortium that won the contract has announced that it plans to irradiate MOX fuel in Virginia Power's North Anna reactors (located near Charlottesville, VA), and in Duke Power's McGuire and Catawba reactors (located near Charlotte, NC, and Rock Hill, SC). 1

The communities around these reactor sites have a great deal at stake in these decisions, and deserve an opportunity to voice their opinions on the MOX proposal. It is also important that DOE solicit input from stakeholders most directly impacted by the MOX plan, and make it easy for them to be heard by holding hearings in their

MR013

MR013–1 **General SPD EIS and NEPA Process**

DOE acknowledges the commentors' request for additional public hearings in the communities near the potential reactor sites that would use the MOX fuel. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

NUCLEAR CONTROL INSTITUTE ET AL.
PAUL LEVENTHAL
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communities. We therefore urge DOE to schedule promptly additional hearings near each of the reactor sites. 1

We thank you for your attention to this urgent matter.

Sincerely,

Paul Leventhal
Nuclear Control Institute

Linda Pentz
Safe Energy
Communication Council

Ethan Brown
Carolina Peace Resource Center

Susan Gordon
Alliance for Nuclear Accountability

David Lochbaum
Union of Concerned Scientists

Robert K. Musil, Ph.D
Physicians for Social Responsibility

Anna Aurilio
U.S. Public Interest Research Group

Don Moniak
Serious Texans Against
Nuclear Dumping

CC: Laura Holgate

MR013

NUCLEAR CONTROL
INSTITUTE

1000 CONNECTICUT AVE NW SUITE 804 WASHINGTON DC 20036 202•822•8444 FAX 202•452•0892
E-mail nci@access.digex.net Web http://www.nci.org

Nuclear Control Institute Comments on the Department of Energy's *Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement*

June 28, 1999

Comments on the Environmental Impact Analysis (Section 5 and Appendix P)

The Nuclear Control Institute (NCI) has long urged the Department of Energy (DOE) to conduct a thorough, accurate and honest assessment of the environmental, safety and health risks associated with irradiating mixed-oxide (MOX) fuel derived from warhead plutonium in existing light-water reactors.[1] NCI believes it is essential that such information be given considerable weight in the development of DOE's strategies both for disposition of U.S. excess plutonium and for cooperation with Russia on their own disposition program. Reactor safety issues have not been given the consideration that they warrant in the formulation of disposition policy, as evidenced by the selection of the MOX-immobilization "dual track" in 1996 based on the rudimentary environmental analysis and flawed calculations of the 1996 *Storage and Disposition of Weapons-Usable Fissile Materials Programmatic Environmental Impact Statement* (S&D PEIS).[2] 1

The calculations of severe accident consequences contained in the *Supplement to the Surplus Plutonium Disposition Environmental Impact Statement* appear to be somewhat improved compared with those presented in the S&D PEIS. However, the overall analysis remains grossly incomplete and inadequate. DOE's final analysis must be strengthened to improve its credibility both with the public and with the Nuclear Regulatory Commission (NRC), which in spite of its relatively late start in examining the safety issues associated with DOE's MOX plan now appears

[1] Edwin S. Lyman, "Comments on the Department of Energy's Storage and Disposition of Weapons-Usable Fissile Materials Draft Programmatic Environmental Impact Statement: Public and Occupational Health and Safety Issues," Nuclear Control Institute, Washington, DC, June 7, 1996 (revised October 9, 1996).

[2] Edwin S. Lyman, "Public Health Consequences of Substituting Mixed-Oxide for Uranium Fuel in Light-Water Reactors," Executive Summary, Nuclear Control Institute, January 1999.

MR022

MR022–1 **MOX Approach**

DOE believes that this SPD EIS does evaluate the potential impacts of fabricating and irradiating MOX fuel, including those associated with postulated design basis and severe accidents at the reactors proposed to use the MOX fuel. In addition to these evaluations, Duke Power Company and Virginia Power Company, the reactor licensees for the plants proposed for irradiation of MOX fuel, would provide analyses and documentation to NRC in support of the required operating license amendments. NRC would not issue a license amendment without the licensee fully demonstrating that the requested change would not compromise safety at the plant.

DOE believes that analyses contained in the *Storage and Disposition PEIS* are sufficient for programmatic decisionmaking. Based on decision made in the *Storage and Disposition PEIS* ROD, to pursue the "dual track" or hybrid approach to plutonium disposition, use of MOX fuel is analyzed in this SPD EIS along with the No Action Alternative and immobilization-only alternatives.

to be taking a more thoughtful approach than DOE.[3] If DOE continues to refuse to address seriously the full array of MOX safety issues, it will be inviting regulatory delays when license amendments to use MOX are sought by the Duke Cogema Stone and Webster (DCS) consortium in the future. 1

1) Beyond-Design-Basis Accident Analysis

The results of the beyond-design-basis accident analysis contained in the *Supplement* are substantially different from those provided by DOE in the S&D PEIS. This is apparent from the information provided in Table 4.28-9. Yet, there is no discussion in the text that explains the reasons for the different results of the two calculations. In addition, the table is misleading in not mentioning the fact that the S&D PEIS results were obtained for a full MOX core, while the *Supplement* calculations are based on a 40% MOX core.

The S&D PEIS calculations, which are cited in the Draft Surplus Plutonium Disposition EIS, indicate that for three out of four severe accident scenarios considered, the number of latent cancer fatalities (LCFs) that would result would be 3%-7% smaller for a full MOX core than for an LEU core. For the remaining accident scenario evaluated (late containment failure), the number of LCFs would be 8% higher for a MOX core.

The calculations in the *Supplement* give nearly diametrically opposite results. The three accident scenarios which were found originally to have less severe consequences for MOX cores than for LEU cores are now shown to have more severe consequences, with increases in LCFs of 1%-15% relative to LEU cores. In contrast, the one accident which was found in the S&D PEIS to have more severe consequences for MOX cores than for LEU cores, late containment failure, is now predicted to have less severe consequences for MOX cores at Catawba and McGuire, but more severe consequences for North Anna. 2

For North Anna, at first glance it appears that the result for late containment failure (a 9% increase in LCFs) is essentially unchanged from the S&D PEIS prediction of an 8% increase. However, taking into account the fact that the S&D PEIS results were obtained for a full MOX core, while the *Supplement* calculations are based on a 40% MOX core, it is clear that the new calculations indicate a MOX impact 2.5 times more severe than that implied by the S&D PEIS results.

The revised results provided in the *Supplement* are consistent with those estimated by NCI in a report released in January 1999 (attached), which found for a generic light-water reactor that the number of LCFs resulting from a severe accident with early containment failure or bypass would be approximately 28% greater for a 1/3-MOX core than for an LEU core as a result of

[3] U.S. Nuclear Regulatory Commission, "Mixed-Oxide Fuel in Commercial Light-Water Reactors," White Paper, 1999.

MR022–2 **Facility Accidents**

DOE agrees with the commentor that the accident consequences presented in Section 4.28 are closer to those postulated by the Nuclear Control Institute in February 1999. The results shown in this SPD EIS are related to the use of specific reactor information and a partial MOX core. It was always DOE's intention to update this section with reactor-specific information once the reactors that would use MOX fuel were identified as stated in the SPD Draft EIS. A footnote was added to the accident table referred to by the commentor to show that the *Storage and Disposition PEIS* evaluated the use of a full MOX core. The consequences of some of the accidents evaluated in this SPD EIS are greater than those presented in the PEIS. The analysis presented in Section 4.28 of this EIS used more precise data from the proposed reactors that have been selected to use MOX fuel.

This SPD EIS also analyzed several reactor accidents, including both design basis and beyond-design-basis accidents. For MOX fuel, as compared to LEU fuel, there is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. Both of these accidents have an extremely low probability of occurrence. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

radiation exposures incurred within one week after the accident.[4] The chief difference between the NCI calculation and that of the *Supplement* is that the latter assumed that americium-241 (Am-241) would be removed from the plutonium via an aqueous separation process (so-called "plutonium polishing") prior to its fabrication into MOX fuel. However, at the time the NCI report was written, the baseline plan was to use only dry processing of plutonium feed, which would not remove the americium. NCI is revising its analysis to consider the effect of americium removal on its results. Preliminary results indicate that for a 40% MOX core with americium removal, the predicted number of excess LCFs is about 25% smaller than that originally estimated (for a 33% core without americium removal) or an increase of about 21% compared to an LEU core. Therefore, NCI's estimate and DOE's upper bound estimate are moving closer together. 2

However, many problems remain with DOE's analysis and presentation of data. These will have to be corrected and/or explained more fully in the final document. These include:

a) The results of calculations of population doses resulting from severe accidents are presented in the *Supplement* without sufficient detail to permit verification by independent analysts. The modeling of population dose in computer codes like MACCS 2 depends strongly on assumptions such as the time period of exposure considered, the cleanup standards, details of the evacuation and a whole host of other parameters. In general, the uncertainties associated with these calculations grow larger as longer time periods are considered. DOE must provide all the input parameters used in the calculations to facilitate independent public review.

Such information may shed light on some of the divergent results between sites, such as the reason why the MOX/LEU LCF ratios are smaller for Catawba and McGuire following a late containment failure accident, but larger for North Anna. These differences may be due to the use of results of the Independent Plant Evaluation (IPE), which have not been thoroughly reviewed by NRC. Because different utilities used different assumptions in developing their IPE submissions, the results may not be consistent for different plants. For instance, the frequencies of early containment failure at Catawba and McGuire given in the *Supplement* are smaller than that of North Anna, despite the fact that Catawba and McGuire have ice-condenser containments which are inherently more prone to failure in severe accident conditions. 3

Also, the reasons for the wide variation in MOX/LEU ratios depending on the particular type of severe accident must be discussed. NCI's analysis did not find such a large difference between early containment failure and containment bypass accidents.

b) There is an obvious error in the calculations in the *Supplement* which must be corrected in the final version. It is apparent from a comparison of population doses and LCFs in Tables 4.21-10 to 4.21-12 that a risk coefficient of 5×10^{-4} LCF/person-rem was used for all the calculations. This is inappropriate because it assumes a dose and dose-rate effectiveness factor (DDREF) of 2 is applicable for the entire affected population. However, this is clearly not the case, because 4

[4] Edwin S. Lyman, January 1999, *op cit.*

3

MR022

MR022–3 **Facility Accidents**

The accident calculations are voluminous, and therefore, included in the Administrative Record for this SPD EIS rather than in the EIS proper. The calculations contain all of the input parameters including the MACCS2 computer files. Principal input parameters, such as accident source terms and population distributions, are included in the EIS.

To determine the consequences and risks of severe accidents, the EIS analysis included data from plant probabilistic risk assessments. Each plant's probabilistic risk assessment is based on plant specific parameters, systems, operating procedures, etc. This often results in different assumptions and conclusions even for similar plants. These probabilistic risk assessments are the best plant specific severe accident data available, and were therefore used in the EIS analysis.

The EIS accident analysis was performed to determine the largest increase in risks when comparing the MOX-fueled reactor to the LEU-fueled reactor for each plant. Therefore, only certain severe accident scenarios, those which would result in the highest risk, were presented in the EIS. This results in a range of bounding severe accident risks providing sufficient information for a NEPA analysis. A complete risk analysis would require a consequence evaluation of every possible release and then summing these risks for an overall risk.

The severe accident scenarios chosen for analysis were selected in the following manner. Containment bypass and failure scenarios were evaluated since these events would result in the highest consequences. The containment bypass and failure release categories from each plant's probabilistic risk assessment were screened to determine which would result in the highest risk to the surrounding population. The probabilistic risk assessments sometimes contain several release categories for a release classification such as early containment failure. Summing the frequencies of all the release categories within the early release classification would lead to the total early release frequency. However, the purpose of this analysis was not to determine the total risk, but to show the largest possible increase in risk as a result of converting to a partial MOX core. Thus, the early release containment failure release category resulting in the highest risk to the surrounding population was presented in the EIS.

many exposures following a severe accident will involve high doses delivered in short periods of time at rates far exceeding the threshold below which a DDREF of 2 is believed to be applicable (i.e. below 10 millirem per minute, according to UNSCEAR). DOE must revise its calculations so that the number of LCFs expected among those experiencing higher doses and/or dose rates are properly estimated using a DDREF of 1. 4

c) The calculations employ the MACCS 2 code developed by Sandia National Laboratories. NCI discovered a major error in this code which has a large impact on calculations of the consequences of severe accidents. Sandia altered the code and provided a corrected version to NCI. DOE should also use the corrected version for its final calculations. 5

d) The MOX/LEU ratios for fission product core inventories are remarkably similar to those used in the S&D PEIS, when adjusted for the different MOX core fraction. This leads one to surmise that Oak Ridge National Laboratory did not recalculate all fission product ratios for input into the *Supplement*, but only those for the actinides, and used the AP-600 ratios for the fission products. NCI has pointed out that the S&D PEIS ratios are not appropriate for use in the *Supplement* because they were obtained from an analysis of the Westinghouse AP-600 LWR, a reactor that has not been built and will not be used for plutonium disposition, rather than from an analysis of the designs of the existing reactors that will use MOX. Moreover, some of the fission product ratios are of questionable validity, such as that for Cs-134. The ratio of the inventory of Cs-134 in a 40% MOX core to that in a full LEU core is given as 0.85 in Table K-2 of the *Supplement*. This corresponds to a full MOX to full LEU ratio of 0.63, which is close to the value of 0.65 originally used in the S&D PEIS. NCI has been unable to reproduce such a low MOX/LEU ratio for Cs-134 in repeated ORIGEN-S runs. The value obtained by NCI is 0.96. (Incidentally, the value for this ratio given in the 1975 NRC Generic Environmental Impact Statement on the use of Mixed-Oxide Fuel in Light-Water Reactors [GESMO] is also 0.96.) 6

2) MOX Fuel Performance and Severe Accident Issues

The *Supplement* is silent on the question of MOX fuel performance, and in particular makes no mention of serious unresolved issues associated with the potentially inferior behavior of MOX fuel in certain severe accidents such as reactivity insertion accidents (RIAs) and loss-of-coolant accidents (LOCAs).[5] These issues will surely be prominent in MOX licensing proceedings.

The *Supplement* assumes that all accident frequencies will remain unchanged by the substitution of MOX for LEU in existing LWRs, and references statements to this effect in the 1995 plutonium disposition study by the National Academy of Sciences (NAS). However, the NAS discussion was very general and did not examine in detail the following issues. These questions must be addressed in the *Supplement* so that the public can be informed about the numerous unresolved issues associated with MOX fuel performance in severe accidents. 7

[5] NRC White Paper, *op cit.*

MR022

MR022–4 **Facility Accidents**

The risk coefficient was corrected and used in the SPD Final EIS analysis.

MR022–5 **Facility Accidents**

The correction to the MACCS2 code was performed and employed in the SPD Final EIS analysis.

MR022–6 **Facility Accidents**

ORNL recalculated MOX/LEU ratios for all radioisotopes, including fission products, for the *Supplement to the SPD Draft EIS* based on operation of a typical Westinghouse pressurized water reactor. These ratios are not based on the Westinghouse AP–600. The MOX/LEU ratios are based on specific fuel enrichments and reactor cycle characteristics. Independent analyses, which do not use identical parameters, would result in different ratios.

MR022–7 **Facility Accidents**

Two significant light-water reactor transients analyzed in safety analyses are the loss-of-coolant accident (LOCA) and the reactivity insertion accident (RIA). Differences between LEU and MOX fuel could affect both of these accidents.

The reduced thermal conductivity in MOX fuel causes the fuel pellets to operate at somewhat higher temperatures than in LEU fuel of the same linear power rating. While the higher operating temperatures would not be a problem for normal operation, the fuel temperatures determine the amount of stored heat present at the beginning of a LOCA. However, the increased energy released per plutonium fission, compared with uranium fission, and early decrease in decay heat for MOX fuel will tend to offset the increased stored energy.

For RIAs, the higher fission gas release associated with plutonium hot spots may increase the severity of the pellet-cladding interaction, and the higher gas inventory may also cause greater entrainment and expulsion of fuel particles after cladding failure. Although, the higher creep rate of MOX fuel may reduce the severity of the pellet-cladding interaction that causes cladding failure at higher burnups.

MOX fuel produced via the MIMAS process, which will be the one used by the DCS consortium, is heterogeneous. It contains plutonium clusters (some of which have diameters of several hundred microns) which act as "hot spots," achieving much higher local burnups than occur in LEU fuel. For a fuel rod with an average burnup of 50 MWD/kg, the plutonium-rich clusters in MIMAS fuel achieve burnups of up to 200 MWD/kg.[6]

The locally high burnups in plutonium-rich clusters result in the formation of high-porosity regions which allow fission gas to escape from the interior of fuel pellets. In addition, MOX fuel has a thermal conductivity approximately 10% lower than LEU fuel, resulting in centerline temperatures about 50°C greater. These two effects cause greater fission gas releases to occur in MOX fuel than in LEU fuel at similar average burnups. Above about 35 MWD/kg, the fission gas release in MOX fuel rods rises to several times that of LEU fuel at the same burnup. Another troubling observation (from recent experiments at the Halden reactor in Norway) is that while fission gas release in LEU fuel ceases when the fuel temperature is lowered below the threshold of onset, the same is not true for MOX fuel.[7]

The increased fission gas release and higher temperature of MOX fuel rods can affect the severity of some accidents such as RIAs and LOCAs. The Rep-Na7 RIA test at the Cabri reactor in France, performed on a fuel rod that had been irradiated for four annual cycles and had a burnup of 55 MWD/kg, resulted in a "very severe failure" which caused the test channel to become almost completely blocked. This failure was unique because the fuel cladding did not have any important corrosion, unlike the LEU rods which failed in the same test series. As a result, according to those who conducted the experiment, "a MOX effect must be considered in this case."[8]

NCI acknowledges that the plan of DCS is initially to irradiate MOX fuel for only two 18-month cycles, whereas some LEU assemblies are now irradiated for three 18-month cycles. However, the *Supplement* should detail the exact fuel management scheme that will be used and specify the maximum MOX assembly and rod burnups that will occur under this scheme.

The maximum burnup to which DCS is initially seeking authorization to take MOX fuel, 50 MWD/kg, is above the maximum MOX rod burnup that is currently permitted in France (about 47 MWD/kg), and is in a region where the rods' resistance to RIAs is clearly in question. Moreover, DCS refuses to preclude eventually irradiating MOX fuel to the same maximum burnup to which it currently irradiating LEU (with maximum rod burnups well over 60 7

[6] "Reactivity Insertion Tests in Cabri with MOX Fuel," F. Schmitz, J. Papin and C. Gonnier, Institut de Protection et de Sûreté Nucléaire (IPSN), International Symposium on MOX Fuel Cycle Technologies for Medium and Long-Term Development, Vienna, Austria, 17-21 May 1999.

[7] W. Wiesenack, M. McGrath, "Performance of MOX Fuel --- An Overview of the Experimental Programme of the OECD Halden Reactor Project and Review of Selected Results," International Symposium on MOX Fuel Cycle Technology, IAEA, Vienna, 17-21 May 1999.

[8] F. Schmitz *et al*, op cit.

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The particular reactivity insertion accident scenario for a pressurized water reactor is a control rod ejection. The Cabri RIA test program was designed to challenge typical fuel rods under conditions that are more extreme than conditions that would be experienced during a real pressurized water reactor control rod ejection. Out of the nine Cabri tests (six with uranium fuel, three with MOX fuel), two uranium fuel rods and one MOX fuel rod experienced failures. The MOX failure occurred at an energy deposition rate that is greater than can realistically be reached by high burnup fuel, even after an extremely unlikely worst case control rod ejection.

These differences suggest that the behavior of MOX fuel during transients could be different than that of LEU fuel. These differences continue to be studied through several research programs. However, until definitive results are obtained, the best available data is the current reactor safety analyses. The offsite consequence analysis of these accidents was therefore based on LEU fuel behavior.

Both LOCA and RIAs were considered in preparing the *Supplement*. Because it was determined that RIAs would result in lower consequences and were of lower risk than the LOCAs, they were not presented in the *Supplement*.

Regarding whether the differences between LEU and MOX fuel affect the frequencies of accidents, an NRC White Paper (1999), *Mixed-Oxide Fuel Use in Commercial Light Water Reactors*, concluded that it appeared likely that the probability of severe accidents will not change and that consequence analyses, rather than full probabilistic risk assessments, may be sufficient to assess the changes due to the different inventory of radionuclides.

NRC believes that severe accident source terms would not be significantly different for MOX fuel than for LEU fuel. This conclusion was based on the assumption that a few percent additional plutonium in the core, with a reduction of only about 10°C (50°F) in melting temperature, will not have a significant effect on accident progression. Also, the processes that remove fission products will not be affected by the small change in composition of the core debris. Further, the source term itself is given in terms of fractions of initial inventory, so these fractions should not be changed significantly.

MWD/kg). It is acknowledged in France that the current generation of MIMAS fuel must be modified and improved before such high burnups can be achieved. DCS should specify in detail how it is going to take into account future fuel modifications in its fuel qualification program.

The issue of MOX fuel performance in LOCAs is one which NRC has highlighted as a concern. Increased fuel and cladding temperature due to the lower thermal conductivity and higher average linear power of MOX assemblies, as well as the possibility of fuel-clad gap reopening due to the increased fission gas release, could enhance the clad oxidation rate during a LOCA and increase the severity of the accident. DOE should address this concern and its proposed LOCA mitigation strategy in the *Supplement*. 7

There are also disturbing indications that the fission gas release dynamics of MOX fuel may lead to enhanced releases of volatile and semi-volatile radionuclides during the early stages of core degradation compared to LEU fuel.[9] This could have an effect on the consequences of some accidents, both design-basis and beyond design-basis.

3) Spent Fuel Management

The *Supplement* claims that the MOX program will not "impact spent fuel management" at the reactor sites, even though it predicts that additional spent fuel assemblies will be generated over the course of the campaign. However, the heat generation of spent MOX fuel will be greater than that of spent LEU fuel. NCI's calculations indicate that for two-cycle spent MOX fuel, the heat generation rate will be more than twice that of two-cycle LEU fuel soon after discharge and will remain at that level for many years. The *Supplement* should discuss how DCS can accommodate this incremental heat loading in their existing spent fuel storage facilities. 8

In summary, NCI believes that DOE cannot make credible or defensible decisions on a plutonium disposition strategy without a much more complete analysis of outstanding reactor safety issues associated with MOX use. Only then can the risks and benefits of various disposition strategies accurately be determined. In our view, the uncertainties and risks associated with reactor irradiation of MOX are significant enough to warrant a reevaluation of the "dual track" strategy. More serious consideration should be given to utilization of an all-immobilization approach to achieve the "spent fuel standard," so that the risks of MOX irradiation can be avoided. 1

Sincerely,

Ph.D.

Edwin S. Lyman, PhD
Scientific Director

[9] Advisory Committee on Reactor Safeguards, "Use of Mixed Oxide Fuel in Commercial Nuclear Power Plants," letter report to the Nuclear Regulatory Commission, May 17, 1999.

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NRC hypothesized that the gap release may marginally increase because of the elevated operating temperatures in MOX fuel compared to LEU fuel. The gap release is used in the analysis of design basis accidents and would not have a large effect on severe accident source terms. Once again, due to the lack of definitive information, for the offsite consequence analysis, the gap release was based on LEU fuel behavior. This possible difference is being evaluated by current research programs and any new information will be implemented in further safety analyses.

DCS proposes to continue the use of an 18-month fuel cycle. Specific fuel management schemes do vary during the life of a particular core life and setting a specific fuel management scheme would not be cost-effective. Maximum MOX fuel burnup levels will be approved by NRC only after thorough safety evaluations including information from current research programs.

MR022–8 MOX Approach

The DCS team reactor utility companies use a typical 18-month fuel cycle, replacing approximately 40 percent of the fuel assemblies in a reactor at each refueling. Some fuel assemblies are used for two cycles, some for three cycles. The utilities plan to maintain the current fuel management schemes and would use the MOX fuel assemblies for only two cycles.

Initially, when spent fuel is removed from the reactor, the MOX and LEU fuel would be about the same temperature and exhibit similar characteristics. After about a year out of the reactor, however, the temperature of MOX spent fuel would exceed that of LEU fuel of the same age. Therefore, storage of MOX spent fuel would increase the thermal loading in a spent fuel pool over that for only LEU fuel. However, thermal load limitations are based on the amount of cooling that the entire spent fuel pool can accommodate, not on individual fuel assemblies within the pool. Therefore, the additional heat load would be accounted for in the calculations for the reactor spent fuel management plans.

PUBLIC HEALTH CONSEQUENCES OF SUBSTITUTING MIXED-OXIDE FOR URANIUM FUEL IN LIGHT-WATER REACTORS

Edwin S. Lyman, PhD
Nuclear Control Institute
February 1999

Executive Summary

Background

In January 1997, the U.S. Department of Energy (DOE) decided to pursue a "dual track" policy for the disposition of approximately 50 metric tons (MT) of plutonium produced for weapons programs that have been declared excess to military needs. The two tracks of the "dual track" refer to two different approaches for converting separated plutonium into a dilute and highly radioactive form that is more difficult to return to weapons.

Under one approach, known as "can-in-canister" immobilization (CIC), plutonium will be incorporated into chemically stable ceramic discs. These discs will in turn be embedded in canisters of "vitrified" (glassified) high-level radioactive waste (VHLW) at the Defense Waste Processing Facility (DWPF) at the Savannah River Site in South Carolina. DOE is tentatively planning to use CIC for approximately 17 MT of excess plutonium in impure forms. The CIC facility will in all likelihood be sited at SRS adjacent to the DWPF.

Under the other approach, plutonium will be used to produce "mixed plutonium-uranium oxide" (MOX) fuel assemblies, which will be loaded and irradiated in a number of U.S. commercial nuclear reactors, displacing some or all of the low-enriched uranium oxide (LEU) fuel assemblies the reactors currently use. DOE is tentatively planning to utilize this option for approximately 33 MT of weapons-grade plutonium (WG-Pu). In 1998, DOE issued a Request for Proposals, seeking vendors interested in providing MOX fuel fabrication and irradiation services. Of the three proposals submitted, two have already been eliminated for failing to meet basic requirements. It is expected that DOE will sign a contract in February 1999 with the third party, a consortium including the French fuel fabricator Cogema and the U.S. utilities Duke Power and Virginia Power. It is also expected that Cogema will build and operate a MOX fuel fabrication plant at SRS, and that the fuel will be irradiated in Virginia Power's North Anna 1&2 plants and Duke Power's McGuire 1&2 plants in North Carolina and Catawba 1&2 plants in South Carolina.

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Both the immobilization and MOX tracks require large-scale handling and processing of plutonium, an extremely hazardous substance. Consequently, they will be expensive to carry out and will pose risks to human health and the environment. However, the costs and risks involved will be small compared to those experienced when the material was produced, and most arms-control advocates concur that the security benefits of plutonium disposition justify the risks.

Some analysts argue further that differences in cost and hazard associated with the two disposition approaches should not weigh heavily in policy decisions. However, this view is out of touch with both budgetary and political realities. Because Cold War-sized government coffers are not likely to be available to DOE for disarmament activities, the plutonium disposition program will be under pressure to minimize costs. Also, many environmental groups and citizens' groups near affected sites will likely oppose any disposition activities unless they clearly have low environmental and public health impacts. It is certainly sensible to reject an option with substantially greater economic and health risks, if it brings no additional benefits.

Cost and public health impact were major considerations in the process that DOE used to select MOX and immobilization from the large number of disposition options that were initially proposed. In deciding on the dual track policy, DOE argued that there are no decisive differences between the MOX and immobilization options with regard to any of its evaluation criteria, including public health impact. However, this report concludes that DOE's evaluation is inaccurate. We find that the public health risks associated with the MOX approach are significantly greater than those associated with CIC. This is due primarily to our findings that the consequences of severe accidents involving LWRs with MOX cores are likely to be greater than those involving LEU cores. 9

Our finding also has international implications. For instance, the U.S. and Russia are also pursuing a plan to utilize Russian excess WG-Pu in VVER-1000 light-water reactors located in Russia and Ukraine, which meet less stringent safety standards than nuclear plants in the U.S. Also, several nations, such as France, Switzerland and Japan, either use or are planning to use plutonium obtained in so-called "civil" reprocessing programs as fuel for LWRs. The "reactor-grade" plutonium (RG-Pu) used in these programs has different isotopic characteristics than WG-Pu and a different impact on reactor safety, including a greater increase in potential consequences. 10

In this report, the public health consequences of severe accidents at MOX-fueled pressurized water reactors (PWRs) are calculated and compared with the consequences of accidents at LEU-fueled PWRs. The acceptability of the increased risk associated with the change from LEU to MOX fuel in U.S. PWRs is then evaluated in the context of the "risk-informed" regulatory procedures now being implemented by the U.S. Nuclear Regulatory Commission (NRC).

Risks of MOX Use

The MOX approach consists of several stages, each of which can have a significant 2

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MR022–9 **MOX Approach**

DOE acknowledges the commentor's concern regarding increased public health risks associated with the MOX approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

As discussed in Section 4.28.2.4, the risks during normal operations using a partial MOX core are almost identical to risks using a full LEU core. As described in Section 4.28.2.5, the risks during accidents may be higher or lower for a partial MOX core, depending on the accident scenario.

The remainder of this comment is addressed in response MR022–2.

MR022–10 **Nonproliferation**

DOE acknowledges the commentor's concerns regarding the disposition of surplus Russian plutonium as MOX fuel, although programmatic and policy issues such as U.S. policies toward plutonium disposition in Russia are beyond the scope of this SPD EIS. Similarly, plutonium reprocessing programs conducted in France, Switzerland, and Japan are beyond the scope of this SPD EIS.

environmental and public health impact. A plant for fabrication of the fuel must be built and operated, the fuel must be shipped to reactor sites, and the fuel must be irradiated in reactors. By comparison, the environmental impacts of CIC immobilization are associated primarily with the operation of the ceramic immobilization plant. Because this plant will be very similar to the MOX fabrication plant in design and size, it will have similar impacts. Therefore, any risks associated with MOX transportation and irradiation increase the cumulative risk of the MOX approach to a level greater than that of immobilization.

In order to quantify and compare the public health impacts of the two options, it is necessary to understand how the risks of nuclear power plant operation change when WG-MOX is substituted for LEU. Risk is defined as the product of the probability and the consequences of a particular event, summed over all events. Nuclear power plants pose risks both as a result of routine operation (high probability and relatively low consequence events) and through the possibility of accidents (low probability and high consequence events). This report focuses on accident risk.

Carrying out a complete and accurate comparison of the accident risks of MOX and LEU cores is a difficult undertaking, for a number of reasons. Nuclear power plant accident safety analyses, or probabilistic risk assessments (PRAs), are extremely complex. In general, the substitution of WG-MOX for LEU fuel will affect both the probability of occurrence and the consequence of each accident sequence which can occur during reactor operation, so that existing PRAs will have to be extensively modified. The difficulty of doing so is compounded by the relative lack of experience with the use of WG-MOX fuel, as well as insufficient data on many technical aspects of MOX use. 2

Another complication results from the fact that almost every nuclear plant in the U.S. has unique features which are relevant to safety, so that the impacts of MOX use are highly reactor-specific. Also, the safety analysis will depend on details of the specific MOX irradiation plan, such as the amount of plutonium in the MOX fuel, the maximum burnup (amount of heat extracted) from each fuel assembly and the fraction of the core (from 33%-100%) that will be loaded with MOX fuel. These details have not been publicly released yet and may for the most part remain proprietary and unavailable to the public.

However, there are some safety-related problems with the use of MOX fuel which will apply to any LWR. For example, the total inventory of highly radiotoxic actinides, including plutonium-239 (Pu-239), americium-241 (Am-241) and curium-242 (Cm-242), is significantly greater in MOX cores than in LEU cores throughout the operating cycle. Our analysis shows that the public health consequences of some severe accidents will be greater for reactors fueled with MOX.

The exact quantities of plutonium and other actinides in MOX cores depend on parameters such as the concentration and isotopic content of the plutonium in the fresh fuel. For the case considered in this study we find that, compared to an LEU core, a full WG-MOX core will contain about three times the amount of Pu-239, seven times as much Am-241 and seven times as much Cm-242 at the end of an operating cycle (i.e. just before the reactor is shut down for reloading). For MOX fabricated with reactor-grade plutonium (RG-Pu), Am-241 and Cm-242 inventories are greater by additional factors of 4 and 3, respectively.

Since most of these radionuclides emit alpha particles, which are much more hazardous per decay than beta or gamma particles if inhaled or ingested, they will contribute significantly to public radiation exposures following severe reactor accidents, even if only a small fraction of the core inventory is released.

The initial draft of DOE's Storage and Disposition of Weapons-Usable Fissile Materials Draft Environmental Impact Statement (DPEIS) did not analyze the environmental impacts of accidents involving MOX-fueled LWRs. Instead, it only included an analysis of an LEU-fueled LWR. DOE justified this by claiming that

> "separate studies ... indicate that the use of MOX fuel in a ... LWR does not increase the risk and consequences of accidents. This results from the fact that the other radioisotopes that are released in an accident have more serious impacts on human health than the Pu used in the MOX fuel."[1] 2

Another DOE study makes the stronger claim that the greater actinide inventories in a MOX core will not affect the consequences of an LWR accident because "plutonium and other insoluble fuel isotopes are not included in the releases to the environment."[2]

These statements are misleading, however. Certain severe accidents can result in the expulsion of significant quantities of actinides into the environment. Although such "beyond design-basis" accidents are expected to occur very infrequently, there are both historical precedents and regulatory requirements for considering them in safety analyses.

The best possible laboratory for loss-of-containment consequences, the Chernobyl accident, has demonstrated that significant and wide-ranging dispersal of actinides is possible. Recent reviews of the Chernobyl source term have concluded that approximately 3.5% of the core actinide inventory was released. Moreover, dispersal of these relatively heavy aerosols was not limited to the immediate vicinity of the plant; fuel fragments were discovered as far away as Greece and Germany, over one thousand kilometers away.[3]

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[1] U.S. Department of Energy, *Storage and Disposition of Weapons-Usable Fissile Materials Draft Programmatic Environmental Impact Statement*, DOE/EIS/0229-D, February 1996, Volume II, p. 4-690.

[2] Oak Ridge National Laboratory, *FMDP LWR PEIS Data Report*, Rev.3, ORNL/MD/LTR-42, December 1995, p. B-22.

[3] L. Devell *et al*. "The Chernobyl Reactor Accident Source Term: Development of a Consensus View," OECD/NEA, OECD/GD(96)12, November 1995.

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It has often been claimed that a Chernobyl-type accident cannot happen in the West because Western reactors have robust containment structures. However, while the presence of containment domes reduces the risk of such accidents, it does not eliminate it entirely. Many accident sequences for U.S. LWRs have been identified which can lead either to massive failure or bypass of the containment, thereby allowing significant releases of core particles. In fact, the U.S. Nuclear Regulatory Commission (NRC) has estimated that actinide releases as high as several percent of the core inventory are possible in such accidents.[4]

In comments on the DPEIS in 1996, the Nuclear Control Institute (NCI) challenged DOE's assumption that there was no difference between LEU and MOX with regard to reactor safety.[5] In particular, NCI cited the possibility of accidents resulting in a relatively large release of actinides.

DOE responded to NCI's comments in the final PEIS on storage and disposition of weapons-usable fissile materials (FPEIS) by presenting the results of a calculation that took into account the different radionuclide inventories of WG-MOX and LEU cores. The FPEIS claimed that the change in accident consequences (defined as the resulting number of latent cancer fatalities) associated with the substitution of WG-MOX for LEU ranged from +8% to -7%: in other words, the number of cancer fatalities caused by some accidents could actually *decrease* as a result of switching to MOX fuel.[6] 2

A complete review of the FPEIS calculation is not possible because few details are provided. However, an analysis of the information that is provided reveals several obvious inconsistencies. For instance, the FPEIS calculation used a value of 0.65 for the ratio of the quantity of cesium-134 (Cs-134) in the WG-MOX core to that in the LEU core. When this ratio was "arbitrarily set to 1.0" in the FPEIS analysis, however, the observed reduction in cancer fatalities associated with switching to MOX fuel changed to an increase. The FPEIS fails to mention a fact that appears in one of its own reference documents --- namely, that various studies have calculated Cs-134 MOX/LEU ratios ranging up to 1.08, and that the value used by the FPEIS was based on a Westinghouse "advanced" PWR and not on an existing reactor type.[7] Our study, which was based on existing PWRs, found a value of 0.96 for the Cs-134 MOX/LEU ratio at the end-of-cycle.

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[4] U.S. Nuclear Regulatory Commission, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants," NUREG-1150, 1990.

[5] Edwin S. Lyman, "Comments on the Department of Energy's Storage and Disposition of Weapons-Usable Fissile Materials Draft Programmatic Environmental Impact Statement: Public and Occupational Health and Safety Issues," Nuclear Control Institute, Washington, DC, June 7, 1996 (rev. Oct 9, 1996).

[6] U.S. Department of Energy, *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement*, DOE/EIS-0229, December 1996, p. S-37.

[7] Oak Ridge National Laboratory (1995), *op cit.*

Another factor that the FPEIS did not take into account is the sensitivity of the consequences of MOX accidents to the fraction of the actinides in the core that is assumed to be released. There are large uncertainties in predictions of the fraction of core actinides that can be released in severe accidents. The FPEIS assumed only very low values of the actinide release fractions.

Because of the flaws in the FPEIS risk calculation, NCI undertook its own study to evaluate the consequences of loss-of-containment accidents at PWRs with MOX cores and compare them to those at PWRs with LEU cores. The specific example of a four-loop PWR with an ice-condenser containment was chosen for analysis. Four of the six plants included in the sole bid now being evaluated by DOE --- Duke Power's Catawba 1&2 and McGuire 1&2 --- are of this type. 2

First, radionuclide inventories were computed for LEU and WG-MOX cores, using the Oak Ridge National Laboratory (ORNL) SCALE 4.3 code to simulate changes in the fuel composition during irradiation. Full WG-MOX cores were considered as the bounding case. Fuel management schemes were based on those in a 1996 Westinghouse report on plutonium disposition in which full-MOX cycles were developed that resembled LEU cycles as closely as possible.

Second, the accident consequences (acute fatalities, early commitment of latent cancer fatalities, and other indicators of risk) for LEU and MOX cores were evaluated for several different accidents, using NRC methodology and the NRC consequence calculation software MACCS2,[8] and ICRP 72 dose coefficients. Generic parameters were used for population and atmospheric data. While the absolute values of consequence measures depend strongly on these parameters, the relative consequences of MOX and LEU accidents are much less sensitive to them.

Finally, the calculated increases in risk associated with substituting MOX for LEU were compared to the acceptance guidelines contained in the recently issued NRC Regulatory Guide (RG) 1.174,[9] "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." RG 1.174 describes a methodology for grading the intensity of NRC review of requested changes to the licensing basis (LB) of nuclear

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[8] D.I. Chanin and M.L. Young, *Code Manual for MACCS2: Volume 1, User's Guide*, SAND97-0594, Sandia National Laboratories, March 1997. In the course of generating data for the present paper, the author discovered an error in the MACCS2 software which resulted in the overcounting of cancer fatalities among individuals receiving committed effective doses (CEDs) greater than 10 sievert (Sv) and a consequent overestimate of population-averaged cancer risk. While the error will not be fixed until release of the next version of MACCS, an "unofficial" corrected version of the code was provided to the author. Although the corrected version has not been officially validated, the results agree well with calculations carried out by the author by hand. All data in this report has been generated with the corrected, unofficial version of MACCS2.

[9] U.S. Nuclear Regulatory Commission, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Regulatory Guide 1.174, July 1998.

power plants according to their risk significance. RG 1.174 therefore provides a framework for evaluating the regulatory significance of the increased risk associated with use of MOX fuel.

Although not directly applicable to the WG-Pu disposition program, the inventory of a typical reactor-grade (RG) MOX core was also calculated for comparison. Because RG-MOX cores have larger quantities of heavy actinides, the consequences of RG-MOX accidents are even more severe than those of WG-MOX, especially at the relatively high plutonium loadings necessary to achieve adequate utilization of the fuel.

Findings

1. The number of latent cancer fatalities (LCFs) committed within one week after a severe reactor accident will be significantly greater for both full and partial WG-MOX cores than for LEU cores. For most accidents considered, the number of prompt fatalities that result will also be greater.

(a) Compared to a PWR using LEU fuel, the number of latent cancer fatalities (LCFs) that will result from exposures immediately following a severe accident with early containment failure or bypass will be significantly greater for a PWR loaded with weapons-grade (WG) MOX fuel, for both full and 1/3-cores of WG-MOX. This is primarily due to the increased concentrations of plutonium and heavier actinides in MOX cores.

For a set of typical severe accidents that result in the release of about 1% of the inventory of plutonium and other actinides (compared with a 3.5% release for the Chernobyl accident), the number of "early" LCFs that result (those due to exposures occurring within one week after the accident), averaged over an operating cycle, was found to be 81%-96% greater for a full MOX core. 2

For a 1/3-MOX core, the corresponding percent increase would be 29%-32%, a factor of three smaller than for a full core. However, because the increase in consequences is essentially linear with respect to the MOX core fraction, the overall excess *risk* (the product of probability and consequences) associated with the disposition program will be approximately the same for both full and partial MOX core loadings. Whether 33 MT of WG-Pu is processed in six plants with a 1/3-MOX core in 15 years, in six plants with a full MOX core in 5 years, or in two plants with a full MOX core in 15 years, the total average increase in risk to the U.S. public will be approximately the same in each case (although the risk to a particular individual may be different).

(b) These increases are considerably greater than the upper limit of the +8% to -7% range cited by the Department of Energy (DOE) in its environmental impact statements on surplus plutonium disposition for full-core MOX.

(c) The actual number of additional LCFs resulting from a MOX accident depends on details of the reactor site, such as population density and atmospheric conditions. For a generic site with a population density of 100 persons/square kilometer (which is very close to the actual density in the vicinity of the Catawba and McGuire plants) the number of additional LCFs within an area of 1000 miles radius, averaged over an operating cycle, was found to range from 1,440 to 6,165 for the set of accidents analyzed for a full-MOX core. For a 1/3-MOX core, the additional LCFs range from 495 to 2,385.

(d) The number of prompt fatalities resulting from acute radiation exposure is greater by around 40% for WG-MOX cores following early containment failure accidents. For containment bypass accidents, a 15% reduction was observed (from 33 to 28 cases) for a full-MOX core, and a 6% reduction for a 1/3-core. However, this reduction in prompt fatalities is tiny compared to the increase in LCFs observed.

2. The additional consequences of severe accidents involving MOX cores are sensitive to the fraction of actinides (i.e. plutonium, americium and curium) in the core that are released.

The increase in accident consequences associated with switching from LEU to MOX depends on the fraction of the actinide inventory that is released, which is a highly uncertain parameter. As the actinide release fraction is varied from 0.3% to 6%, the percent increase in LCFs resulting from an full-MOX core accident with early containment failure, averaged over an operating cycle, ranges from 39% to 131%, corresponding to an additional 1,730 to 18,185 LCFs for the generic reactor site. In the worst case, the number of *additional* cancers associated with a MOX accident is 60% as large as the *total* number of cases predicted to occur worldwide from the Chernobyl accident. For a 1/3-MOX core, the percent increases range from 14% to 44%, corresponding to an additional 610 to 6,135 LCFs. 2

3. The average latent cancer fatality accident risk to the population within ten miles of a nuclear plant is increased by approximately a factor of two when a full core of WG-MOX is substituted for LEU. This increase in risk is significant when compared to the risk limits in NRC's Safety Goal Policy Statement.[10] According to NRC's Regulatory Guide 1.174, a change in the licensing basis resulting in a doubling of risk <u>would not be allowed</u> for typical U.S. PWRs. The increase in risk associated with loading a 1/3-core of WG-MOX would also be unacceptably high.

When a full core of WG-MOX is substituted for LEU, the average increase in latent cancer fatality risk to the population near a reactor site nearly doubles. This is equivalent to the increase in risk that would occur if the probability of a severe accident with a large early release of radioactivity (the Large Early Release Frequency, or LERF) were doubled. For the PWR considered in this study, this would correspond to an increase in LERF of about seven in a million ($7x10^{-6}$) per year for a full MOX core, or more than two in a million ($2x10^{-6}$) per year

[10] U.S. Nuclear Regulatory Commission, "Safety Goals for the Operations of Nuclear Power Plants: Policy Statement," *Federal Register*, 51 FR 30028, August 4, 1986.

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for a 1/3-MOX core. In both cases, these exceed the threshold of one in a million (1×10^{-6}) per year established in NRC's Regulatory Guide 1.174 for allowable increases in LERF.

4. The use of WG-MOX in U.S. PWRs is not likely to lower the probability that a severe loss-of-containment accident may occur and may in fact increase it significantly.

Some reasons why this is the case are listed below.

(a) The ability of high-burnup MOX fuels in current use to withstand severe accident conditions is inferior to that of LEU fuel.

It has been observed that MOX fuel assemblies fabricated with current techniques are inferior to LEU fuel with regard to their integrity during abnormal events that cause rapid heating of the fuel, such as reactivity insertion accidents (RIAs) and loss-of-coolant accidents (LOCAs). Based on the results of a series of RIA tests at the Cabri test reactor in France, French regulators have concluded that "MOX fuel shows a higher failure potential than UO_2 at comparable burnup." In particular, a MOX fuel rod with a burnup of 55 gigawatt-days per metric ton (GWD/MT), which is typical of burnups achieved in U.S. PWRs today, experienced a violent rupture and dispersal of fuel particles, while two LEU rods of comparable and higher burnups were able to withstand similar conditions without rupture.[11] Based on this test, a French regulator recently concluded that this was a MOX-related phenomenon and that there is a "very high potential for rupture" of MOX fuel in RIA situations.[12]

(b) A MOX-fueled PWR may have a greater risk of experiencing pressurized thermal shock of the pressure vessel. 2

Due to a more rapid cooldown of the reactor vessel following a break in a main steam line, a MOX-fueled PWR may have a greater risk of experiencing pressurized thermal shock (PTS) than one fueled with LEU. PTS is a very severe event in which the reactor vessel becomes brittle at low temperature (below about 180°C or 350°F) and ruptures at high pressure, causing core debris to be expelled into the containment. Following such an event, it is nearly impossible to maintain cooling of the core and a meltdown becomes a virtual certainty. In addition, a sufficiently powerful rupture of the pressure vessel could damage the containment.

[11] DOE has recently claimed that the Cabri test is not relevant to the U.S. MOX program, arguing that (1) the burnup was higher than that which MOX rods will experience in U.S. reactors, and (2) the Cabri test rod was an obsolete fuel type with a high degree of heterogeneity. Both these statements are false. PWR fuel assemblies are authorized in the U.S. for burnups up to 62 GWD/t, and reactor operators expect that MOX and LEU fuel assemblies will be fully interchangeable. The Cabri rod was fabricated using the MIMAS process, which the French and Belgian industries have been using since 1984 and which is expected to be the process that a U.S. MOX fabrication plant will utilize. DOE is not encouraging the development of improved MOX fuel for the U.S. program because of the delays that would occur in its qualification.

[12] A. MacLachlan, "International Meeting Fails to Resolve Questions Surrounding Cabri Future," *NuclearFuel*, July 27, 1998, p. 6.

(c) Ice-condenser containments may be more vulnerable to early failure in a severe accident than large dry containments.

Four of the six PWRs that have been offered for MOX irradiation services in the sole remaining proposal being evaluated by DOE, Duke Power's Catawba 1&2 and McGuire 1&2, have ice-condenser containment structures. These containments are smaller in volume and have less structural strength than other types of PWR containments. In the event of a core melt, followed by failure of the reactor pressure vessel at high pressure, a phenomenon known as high-pressure melt ejection (HPME) can occur, resulting in a very rapid heating and pressurization of the containment atmosphere (direct containment heating, or DCH) which can cause containment failure. Ice-condenser containments "do not have the same inherent capacity to withstand the credible DCH loads from all scenarios as other Westinghouse plants," according to NRC.[13] The ability of ice-condensers to withstand hydrogen combustion events and steam explosions is also questionable.

Together, these facts raise the concern that if U.S. utilities plan to irradiate MOX fuel to a burnup comparable to that of LEU fuel, the risk of violent rupture and fuel dispersal that makes cooling of the core debris more difficult will be increased. Moreover, because such accidents can result in both dispersal of the core into the containment and early containment failure through the phenomenon of direct containment heating, they are also associated with release of solid core materials, such as actinides, into the environment. Therefore, both the consequences and the probability of this class of accidents may increase when MOX is substituted for LEU in PWRs. 2

5. A severe accident at a PWR with a reactor-grade MOX (RG-MOX) core would cause up to twice as many latent cancer fatalities (LCFs) as would an accident at a PWR with a WG-MOX core.

The number of LCFs resulting from a severe accident at a PWR fueled with a full core of RG-MOX, at the end of an operating cycle, was found to be 123%-486% greater than that resulting from an accident at a PWR fueled with LEU, depending on the actinide release fraction. This is more than twice as many cases as would result from an accident involving a WG-MOX core. This dramatic increase in risk should be taken into consideration by nations that are currently using or planning to introduce RG-MOX in their nuclear plants. Recently, some U.S. policy-makers who regret the U.S. decision not to pursue commercial spent fuel reprocessing and plutonium recycling have been seeking to take advantage of the current political difficulties of siting a geologic repository for spent fuel to revive the reprocessing option in the U.S. The results of this article provide an additional validation of the U.S. decision and another argument why reprocessing and recycle should be avoided.

[13] U.S. NRC, "Status of the Integration Plan for Closure of Severe Accident Issues and the Status of Severe Accident Research," SECY-98-131, June 1998.

Conclusions

1. Licensing of U.S. reactors to use MOX will have to take place primarily on a site-specific level. In addition, an NRC finding that MOX use poses "no significant hazards" under 10 CFR 50.92 clearly would not be justified.

A key question in the procedure for licensing reactors to use MOX fuel will be whether NRC will rule, under the procedures outlined in 10 CFR 50.92, that the introduction of MOX fuel into existing reactors involves a "significant hazards consideration," which would obligate the NRC to conduct public hearings prior to issuance of a license amendment. Prospective industry participants in the MOX program have indicated that they intend to have the MOX reload core methodology licensed on a generic basis, thereby removing most MOX-related issues from consideration on a plant-specific level. In this way, they hope to facilitate an NRC finding of "no significant hazards" in individual plant license amendment proceedings and thus prevent the possibility of site-specific hearings that could lead to substantial delays in introducing MOX fuel into reactors.

However, the results of this study indicate that site-specific considerations, such as the public health impacts associated with changes in the licensing bases of existing plants to use MOX fuel, will indeed be substantial, and therefore it should not be possible for NRC to justify issuing a finding of "no significant hazards" on the plant-specific level.

2. Limitations on MOX fuel burnup to below 36 GWD/MT should be imposed unless high burnup safety issues are resolved.

Concerns with the performance of high-burnup MOX fuel in the event of an accident have led the French nuclear safety authority DSIN to restrict the burnup of MOX fuel to 36 GWD/t, whereas LEU fuel is permitted to reach 47 GWD/MT. The French national utility Electricité de France (EdF) has concluded that to achieve burnup parity with LEU, a new MOX fuel type will have to be developed. Such an effort could cause substantial additional delays to the MOX mission. The U.S. should follow France's lead and restrict MOX burnup pending resolution of these safety issues, even though this will be a costly inconvenience for U.S. nuclear plants.

3. Licensees who wish to use WG-MOX will have to demonstrate to NRC that the Large Early Release Frequencies (LERFs) of their plants are below one in a million (1×10^{-6}) per year. Even if they can meet this requirement, the request will be subject to an intensive NRC technical and management review, and the underlying probabilistic risk assessment (PRA) calculation will have to undergo peer review and satisfy quality control requirements.

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We have shown that the introduction of a full core of MOX fuel into PWRs will result on average in a doubling of the risk to the public from a large early release of radioactivity. This increase in risk is equivalent to that which would occur if the Large Early Release Frequency (LERF) of the plant were doubled. According to NRC's RG 1.174, a change to the plant licensing basis resulting in a doubling of the LERF would only be considered for plants with a

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MR022–11 **DOE Policy**

DCS does not intend to request licensing of MOX fuel use on a generic basis. Duke Power and Virginia Power, the reactor licensees, would submit individual reactor license amendment requests to NRC for each of their reactors in which the MOX fuel would be irradiated. Plant-specific core load and safety analyses would be performed, and an NRC license amendment approved, prior to MOX fuel being introduced into any reactor. All issues considered by NRC to be important to safety and the environment would be evaluated during the license amendment process.

MOX fuel burnup is proposed at 45 GWD/t with peak pin burnup of 50 GWD/t. Actual MOX fuel burnup limits will be established in concert with the NRC following a thorough safety review. It should be noted that reactors in Belgium and Germany typically use MOX fuel to burnups between 45 and 50 GWD/t and that while current French burnup limits are lower than that, French burnup limits for LEU fuel are also lower than those for U.S. reactors.

There is a recognition that detailed analyses would need to be done to support the NRC license amendment process. This information would be prepared if the decision is made in the ROD to go forward with the MOX approach. The commentor's interpretation of NRC Regulatory Guide 1.174 is his opinion and may not be the interpretation adopted by NRC.

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baseline LERF of one in a million ($1x10^{-6}$) or below. For a 1/3-MOX core, the corresponding threshold would be three in a million ($3x10^{-6}$).

The guidelines in RG 1.174 are not absolute. In particular, an applicant may argue that quantitative increases in risk are offset by "unquantified benefits" and that a less strict NRC response is warranted. Even so, plants wishing to use MOX will have to undergo intensive site-specific reviews by NRC, and may have to conduct full-scope (Level 3) probabilistic risk assessments (PRAs), which very few plants have done to date because of the time and expense involved. These will be necessary to document that the Large Early Release Frequencies of the plants are sufficiently low that the increased risk associated with a large early release from a MOX-fueled plant are "small and consistent with the intent of the Commission's Safety Goal Policy Statement." Moreover, PRA documentation will have to be done more carefully and in more detail in the future. Because of the great variability in the content and quality of PRAs that have been carried out to date, NRC is in the process of developing a quality control standard for PRAs submitted in support of risk-informed regulatory proceedings. 11

4. The U.S. plan to encourage Russia to use WG-MOX in Russian and Ukrainian VVER-1000 LWRs poses even greater risks than the plan for U.S. domestic use of WG-MOX.

Russian VVER-1000s do not meet Western safety standards in such critical areas as fire protection and instrumentation and control systems. Although the U.S. is encouraging Russia to commence a program for using WG-MOX in VVER-1000s, and has provided a portion of the initial financing, there will be no simultaneous effort to upgrade these plants so that they fully meet Western safety standards, which would cost on the order of $150 million per unit, according to recent estimates. In fact, Russia has to date been reluctant to accept Western assistance for plant safety upgrades. Given that the use of MOX will increase risk even in plants that do meet Western standards, encouraging Russia to use MOX in its less robust plants without ensuring maximum possible adherence to safety is nothing short of reckless. 10

5. Risks associated with irradiation of WG-MOX in both U.S. LWRs and Russian VVER-1000s could be averted if both nations implemented an all-immobilization policy for the entire stockpile of excess WG-Pu. The use of MOX is unnecessary and should be avoided.

The significant additional public health risks of MOX use in existing nuclear plants cannot be justified in terms of the security benefits of plutonium disposition, because a less risky alternative exists --- immobilization. The insistence of the Russian Ministry of Atomic Energy (MINATOM), along with U.S. and European nuclear interests, that immobilization is not an acceptable approach for either the U.S. or Russia, is one of the driving forces behind the heavy emphasis on MOX in both countries. However, the U.S. should not be compelled by a handful of bureaucrats and industry lobbyists to adopt an outdated, shortsighted and technically flawed approach that will unnecessarily endanger the health of its citizens. Rather than proceeding with the MOX plan, the U.S. should recognize and highlight the environmental, economic and security advantages of immobilization and explore creative ways of enhancing its acceptability both at home and in Russia. 9

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FELIX M. KILLAR, JR.
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NEI

NUCLEAR ENERGY INSTITUTE

Felix M. Killar, Jr.
DIRECTOR,
Material Licensees & Nuclear Insurance
Direct Line 202.739.8126
Internet fmk@nei.org

June 28, 1999

Ms. Laura S. H. Holgate
Director, Office of Fissile Materials Disposition
U.S. Department of Energy
Supplement to the SPD EIS
P.O. Box 23786
Washington, DC 20026-3786

Dear Ms. Holgate:

The Nuclear Energy Institute (NEI) has reviewed the Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement. We did not identify any significant comments to submit.

NEI would like to take this opportunity to endorse the Department of Energy's (DOE's) hybrid approach to plutonium disposition, with the majority of the surplus plutonium dedicated for use in existing reactors as mixed oxide fuel. NEI notes that the environmental impacts of the preferred plutonium disposition alternative (hybrid approach) are relatively minor, and the nonproliferation benefits of the program make the preferred alternative far superior to the "no action" alternative. In addition, NEI commends DOE for its thorough efforts to provide for public input as a part of the Surplus Plutonium Disposition Environmental Impact Statement process. 1

Sincerely,

Felix M. Killar, Jr.

1776 I STREET, NW SUITE 400 WASHINGTON, DC 20006 3708 PHONE 202 739.8000 FAX 202 785 4019

MR019

MR019–1 **Alternatives**

DOE acknowledges the commentor's support for the hybrid approach and appreciates the recognition of its public outreach efforts.

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Nuclear Information & Resource Service
1424 16th St. NW Suite 404
Washington, DC 20036
(202)328-0002
http://www.nirs.org

To: U.S. Department of Energy
Office of Fissile Materials Disposition
P.O. Box 23786
Washington, DC 20026-3786

Via Fax: 800-820-5156

Comments on the Supplement to Surplus Plutonium Disposition Draft Environmental Impact Statement

Prepared by Mary Olson, Nix MOX Campaign Coordinator

We share the overall goal of this program: to render weapons plutonium unusable in weapons. We oppose the proposal to make plutonium fuel for nuclear power reactors in the United States, Russia, Canada or anywhere else for that matter.

This is an experimental program with extremely high stakes which are not justified under any circumstances. The assertion that the Russians are dictating the US program is simply not credible. The US would wage a reversal of our policies against plutonium in commerce, risk a major reactor accident here and in Russia for the minor benefit of isotopic alteration of plutonium in Russia since they propose nothing more than a delay in the reprocessing of the MOX fuel and moving ahead towards a plutonium cycle, at US tax payers expense. The fact that plutonium fuels increase the real hazard of US reactors is not justified by this marginal gain a the geo-political level. 1

Comments on the Process

We appreciate that the Department is finally providing site specific information about irradiation of MOX, and for this opportunity to comment. However, the Department has made a mockery of public participation in a decision making process, and the inclusion of those most impacted in the process. The fact that there is already a consortia under contract which includes the use of these reactors (Duke Power's McGuire and Catawba and Virginia Power's North Anna reactors) precludes the very consideration of whether to use them or not. Further, the fact that DOE has not seen fit to do any public education or solicitation of direct in-put from these host communities betrays any claim that DOE has conducted a fair process as described under the National Environmental Policy Act. 2

We (again) formally request that DOE hold hearings on this Supplement and draft EIS in the vicinity of Duke Power's McGuire and Catawba and Virginia Power's North Anna reactors. While the people of Columbia, SC appreciated the opportunity provided by 3

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FR003–1 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again. DOE will announce its decisions regarding the approach to surplus plutonium disposition in the SPD EIS ROD.

While it is true MOX fuel has not been produced commercially in the United States, it has been produced in Western Europe. MOX fuel fabrication is not a new technology. This experience would be used to benefit disposition of the U.S. surplus plutonium.

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials. DOE will continue to discourage Russia from reprocessing its spent nuclear fuel and starting a plutonium cycle but this issue is beyond the scope of this SPD EIS.

FR003–2 **General SPD EIS and NEPA Process**

DOE conducted a procurement process in accordance with DOE NEPA regulations 10 CFR 1021.216. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. As stipulated in DOE's phased contract with DCS, until and depending on the decisions regarding facility siting and approach to surplus plutonium disposition are made and announced in the SPD EIS ROD, no substantive design work or construction can be started by DCS on the MOX facility. Should DOE decide to pursue the No Action Alternative or the immobilization-only approach, the contract with DCS would end. The contract is phased so that only nonsite-specific base contract studies and plans can be completed before the ROD is issued, and options that would allow construction and other work would be exercised by DOE if, and only if, the decision is made to pursue the MOX approach.

Efforts were made to contact persons living near the selected reactor sites and inform them of the proposed use of MOX fuel. The *Supplement to the SPD Draft EIS* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD.

Since the inception of the fissile materials disposition program, DOE has supported a vigorous public participation policy. It has conducted public hearings in excess of the minimum required by NEPA regulations to engender a high level of public dialogue on the program. The office has also provided the public with substantial information in the form of fact sheets, reports, exhibits, visual aids, and videos related to fissile materials disposition issues. It hosts frequent workshops, and senior staff members make presentations to local and national civic and social organizations on request. For example, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in the public hearing that was held in Columbia, South Carolina, on June 24, 1999. Additionally, various means of communication—mail, a toll-free telephone and fax line, and a Web site (http://www.doe-md.com)—have been provided to facilitate the public dialogue. It is DOE policy to encourage public input into these matters of national and international importance.

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Senator Leventis, the June 24 event in Columbia cannot be construed as a substitute for hearings in the reactor communities. We also request an extension of the comment period. It is not appropriate to hold a single hearing and then close the comment period within a week. 3

Information Missing From the Supplement

In order to compare the 100% immobilization route to plutonium disposition with the hybrid approach that include making and using MOX plutonium fuel there are a number of direct comparisons which must be made. Most of these are in the department of contamination and waste.

Nowhere in the supplement or the draft EIS is there a compilation with radioisotopic profiles of the operating wastes and discharges. To get the full picture, reference must be given for each of the chosen reactors using LEU uranium fuel, projections using MOX fuel and the totals (including Pu processing and fuel fabrication) compared to the immobilization route.

Of particular interest is the air and water discharges and so-called "low-level" waste generated. It is not sufficient for the Department to simply say that the current regulation swill be met. The question remains whether the waste and discharges would bear more plutonium and total actinides and whether there would be more fission products and what the profile of tritium generation would be. Since we do recognize current regulations to be protective we are still interested in the net impact of shifting part of the fuel used in these reactors in such a way as to increase the plutonium in the system.

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While it is possible to assert, as the Department does, that regulations would be met, this does not guarantee that in fact, the regulations will be met. Nor does this assertion justify the practice of putting unique, untested plutonium fuel in existing, aging reactors. The International Committee on Radiological Protection (ICRP) explicitly states in publishing their guidelines that society must justify a practice which leads to radiation exposure, and the standard is then applied, not he other way where the assumption is that any practice that meets a standard is therefore justified. The ICRP guidelines are the basis on which national regulators establish existing national radiological standards.

Current waste standards allow the generator to simply prepackage and dilute to meet regulations. Further, the basis for regulation of discharges looks only at each year's discharge, with no reference to the loading of the environment with persistent radionuclides.

It is also not appropriate to look at only one year of discharge for each reactor. It would be more appropriate to average the discharge to air and to water, each over 5 years, since there is considerable variation between years in air and water discharge. These figures would then be compared to projections of discharges to air and water using MOX fuel ,

FR003

FR003–3 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's request for additional public hearings in the communities near the proposed reactor sites. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Further, as discussed in response FR003–2, DOE attended and participated in a public hearing in Columbia, South Carolina at the invitation of Senator Phil Leventis. Moreover, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process should the MOX approach be pursued per the SPD EIS ROD.

FR003–4 **Waste Management**

The commentor states that the radioisotopic inventories of emissions from the reactors need to be assessed using MOX fuel against using LEU fuel. For normal operating conditions, the emissions are the same. The only emission stream that might result from using MOX fuel that would result in a different radioisotopic mix than LEU fuel occurs in the event that there is a MOX fuel failure, in which there is a emission pathway from the core. Given the history and integrity of fuel, a fail failure may never occur during the limited fuel campaign to disposition surplus plutonium. Notwithstanding, if there were a MOX fuel failure, the effect on the radioisotopic inventory in emissions would be almost indistinguishable because: (1) the radionuclide inventories in MOX and LEU fuel are similar (as shown in Table K–27) and (2) the contribution of fuel failures to the total emissions from the reactor is small (other contributions to the site's effluents dominate).

Electricité de France reactors in France have seen little or no changes in radionuclide releases in effluents from the use of MOX fuel. All of the proposed reactors would continue to operate within stringent NRC 10 CFR 20 and 10 CFR 50 radionuclide release and dose requirements. Doses for hybrid alternatives and immobilization-only alternatives are given for each of the candidate sites in Appendix J and for each applicable alternative in Chapter 4 of Volume I.

While it is accepted that there are differences in fission product inventories and activation products between an LEU and MOX core during a fuel cycle, these differences are small enough that essentially no dose differential can be observed by members of the public during normal reactor operations. The only time significant quantities of fission products could be released to the environment would be in the event of a large-scale fuel leak. In regard to normal operations, FRAGEMA's (a subsidiary of COGEMA; one of the companies chosen to operate the proposed MOX facility) experience with fabricating MOX fuel indicates a leakage rate of less than one-tenth of 1 percent. FRAGEMA alone has provided 1,253 MOX fuel assemblies, with more than 300,000 fuel rods for commercial reactor use. There have been no failures and leaks have occurred in only 3 assemblies (a total of 4 rods). All leaks occurred as a result of debris in the reactor coolant system and occurred in 1997 or earlier. The French requirements for debris removal were changed in 1997 to alleviate these concerns. Since that time, there have been no leaks in MOX fuel rods.

In the event of a leaker, fission products are released into the primary containment and are ultimately either passed through a series of resins (for liquid releases) or through a HEPA filtration system (for releases to the atmosphere) that would capture approximately 99.99 percent of the radionuclides. In either case, the impact on dose would be expected to be small.

The use of MOX fuel would not be expected to result in any additional radioactive discharges to the air or water, or the production of additional LLW because the reactors would continue to operate on the same schedule as if they were using only LEU fuel. Any additional ionizing radiation would be limited to the containment and not reach the public. It is important to recognize that the quantities of "key" radionuclides (i.e., those radionuclides that typically account for the vast majority of public dose from normal reactor operations) are projected to remain about the same or in some cases decrease when a partial MOX core is used. These radionuclides include: iodine 131, cobalt 60, cesium 137, and tritium. By the end of core life, the presence of these radionuclides is expected to increase by 3 percent, decrease by 28 percent, decrease by 9 percent, and decrease by 5 percent, respectively, as presented in Table K–27 when a partial MOX core is used.

As described in Section 3.7, the waste generation rates are 5-year average waste generation rates. Since waste generation rates and isotopic composition are not expected to change appreciably, offsite municipal and commercial waste treatment and disposal facilities, and nuclear laundries should not be adversely affected. Likewise, activities of state regulators and the LLW disposal compacts should not be adversely affected.

The reactors for MOX fuel irradiation would not be operated by DOE. The reactors would continue to be operated by the utilities and regulated by NRC. Eventual D&D of the reactors, to include any recycling of metals, would be performed by the utilities in accordance with NRC regulations in force at that time. However, it is premature to assume that scrap metal at the reactors would be recycled as part of D&D. MOX fuel use is unlikely to impact reactor D&D since as described above, radionuclide inventories and contamination are unlikely to change significantly.

based on real data from the so-called experience of the consortia members, radionuclide by radionuclide.

The same would be repeated for so-called low-level waste.

The reason that this must be done is so that decision makers at all levels of the impacted communities can really weigh the MOX option against the no-MOX option where uranium fuels continue to be used. Municipal drinking water is at stake. Ground and surface water is at stake, state resources for dealing with so-called low level waste sites are also at question.

This analysis must be carried fully to all the extensions of reactor operations: nuclear laundries – on –site and off, nuclear decontamination and waste treatment facilities, incinerators of so-called low-level waste, brokers of this waste (off-site storage) and all transportation steps between these points. What is the radioisotopic profile compared to uranium and what are the doses that would be expected. 4

Finally, because of the Department's cavalier practice of releasing radioactively contaminated metals from decommissioning to the market place as if they were not radioactive, it is also necessary to compare the contamination of metals and other materials from LEU operations and MOX operations. We oppose the release of this material, but do not think that an analysis of the relative impact of MOX and LEU will be complete without it.

Inappropriate Risk Assessment

It is not credible to tie the current health effects analysis to the calculated risk associated with a single year of the operation of any of the 6 chosen reactors. If residents in the area of these reactors only lived there one year, there could be an argument made for this. For the most part they live there longer. Regulations should assume that someone is going to spend their life in this location. That is still a strong cultural tradition in the United States. When the risk factors given are multiplied by 70 year life span one arrives at the familiar, and still unacceptable 3.5 cancer fatalities in 1000 life time exposures given an annual dose on 100 millirems . This is nothing to brag about. 5

We appreciate that the Department has significantly altered their analysis of the impacts of MOX plutonium fuel on the health effects resulting from a major reactor accident.. However, the claim that the likelihood of such an accident occurring is only 1 chance in 4.2 million per year is not credible. The Chernobyl accident happened. It is an ongoing example of the type of core breach that plutonium fuel would complicate. Chernobyl happened in less than 3000 worldwide reactor years. It was the third, perhaps more, reactor accident, but the first core dump. To calculate probability on a model when we have direct data is folly. One can argue that the reactors are different and that containment is a factor. However, containment fails at US reactors regularly, we are simply lucky that this has not (yet) happened coupled with a major reactor problem. OF 6

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FR003–5 **Human Health Risk**

The assertion of 3.5 cancer fatalities over 70 years for a population of 1,000 people is accurate when assuming that each of these persons incurs the maximum permissible public dose level (per 10 CFR 20) of 100 mrem/yr. However, it should be noted that this 100 mrem/yr dose is a limiting dose as established in the U.S. Code of Federal Regulations and that the three candidate reactor sites (Catawba, McGuire, and North Anna) do not come close to this dose value for even a hypothetical MEI. As shown in Section 4.28, the MEI at these sites would be expected to receive an annual dose of less than 1 mrem. Hence, over a 70-year timeframe, this actually equates to 0.035 fatal cancers in a population of 1,000 persons. It should also be noted that the probability of just one individual receiving this "hypothetical maximum exposure" of 1 mrem/yr is small; therefore, an annual exposure of 1 mrem to 1,000 persons is highly unlikely. A typical member of the public would receive an annual dose from natural background radiation which is roughly 300 times higher than the hypothetical 1 mrem dose received from MOX reactor operations.

FR003–6 **Facility Accidents**

The frequency of occurrence estimates were obtained from each plant's probabilistic risk assessment in response to NRC's request for individual plant examinations to assess each plant's vulnerability to severe accidents.

It should be noted that D.C. Cook has been shut down due to issues unrelated to its ice condenser. NRC has not considered it necessary to restrict operation of any of the other reactors in the United States that use ice condenser containments.

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real concern is the choice to use 4 Duke ice condenser model reactors,. where like DC Cook. the containment can be unusable. 6

Chances of an Accident Greater

The physics of plutonium fission are not the same using weapons plutonium as either MOX fuel from reprocessing or the consistent claim from industry that this is no different from the fissioning of the plutonium which reactors make towards the end of their fuel cycle.

A higher percentage of prompt neutrons a positive coefficient of heat reactivity and the tendency to accelerate the aging of reactors, as well as the possible degradation of fuel cladding by any possible residual gallium leads us to assert that a reactor accident is more likely to occur using MOX plutonium fuel. 7

The Department acknowledges that the consequences of a core-dump type accident will be worse than if LEU furl was used.. In making a comparison, one must assume the probability off the event occurring is 1. This means that there is an absolute increase in hazard, even if the probability is low.

Need For Site Specific High-Level Waste Analysis

Supplement needs to include a very detailed comparison of LU and plutonium MOX fuel and the type of issues that are currently being seen with dry cask storage challenges. These include metallurgical reactions between fuel and coolant and the gases as well as coatings on the inside of the casks. There are also thermal load issues with being able to unload these casks. 8

There needs to be a detailed analysis of potential impacts on a repository at Yucca Mountain. 9 What about comparative doses during transport? 10

Thermal load issues are of paramount concern for fuel pools and the reactor core in the case of extended loss of off-site power to the reactor . Turkey Point, Davis Besse and a Scottish reactor are all examples of the short fuse that LEU fuel has,. What is the impact of 40% MOX on these parameters? These are all site specific concerns. 11

If use of MOX is going to cause these 2 utilities to have more waste to handle, and need a fuel pool that is relatively open, then what about the impact on having to load more dry casks sooner. What about this in the context of current Department negotiations over high-level nuclear waste obligations? Who pays if the utility must go to dry casks sooner than otherwise? 12

No increased exposure to workers is not credible. 13

No plutonium contamination expected from plutonium activities at SRS is not credible. 14

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FR003–7 **Facility Accidents**

Differences between MOX fuel and uranium fuel are well characterized and can be accommodated through fuel and core design. Initial evaluations indicate that partial MOX fuel cores have a more negative fuel Doppler coefficient at hot zero power and hot full power, relative to LEU fuel cores for all times during the full cycle. These evaluations also indicate that partial MOX cores have a more negative moderator coefficient at hot zero power and hot full power, relative to LEU fuel cores for all times during the full cycle. These more negative temperature coefficients would act to shut the reactor down more rapidly during a heatup transient.

All of the factors discussed by the commentor were evaluated by the proposed reactor licensees to ensure that the reactors can continue to operate safely using MOX fuel and will continue to be evaluated. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by the reactor plant operators as part of their license amendment applications.

For MOX fuel, as compared to LEU fuel, there is an increase in accident risk for certain accident scenarios, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48,000 per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

FR003–8 **MOX Approach**

Initially, when spent fuel is removed from the reactor, the MOX and LEU fuel would be about the same temperature and exhibit similar characteristics. After about a year out of the reactor, however, the temperature of MOX spent fuel would exceed that of LEU fuel of the same age. By the time the decay heat from MOX spent fuel assemblies becomes significantly greater than that from LEU fuel, the total decay heat load in the spent fuel pool would have dropped to such a point that it is no longer limiting from a heat removal standpoint. Consequently, there would be minimal adverse impact on the cooling needed for irradiated fuel assembly storage due to substitution of MOX for LEU fuel assemblies. During the base contract period, the utilities would confirm the decay heat removal characteristics of the MOX fuel assemblies and would confirm what, if any, modifications may be needed to the spent fuel pool and dry storage cask cooling systems. If necessary, the MOX spent fuel could be preferentially retained in the spent fuel pools and only LEU spent fuel moved to dry cask storage. This would eliminate any concerns about storing MOX fuel in dry casks.

FR003–9 **Repositories**

This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository. The potential MOX spent fuel and/or immobilized plutonium are included in the inventory analyzed in that draft EIS should the decision be made to proceed with the hybrid or immobilization-only approaches.

FR003–10 **Transportation**

As described in Appendix L.5.4, all shipments (including MOX spent fuel shipments) were conservatively assumed to have a dose rate equal to the regulatory limit of 10 mrem/hr at 2 m (6.6 ft). The dose rate near a vehicle carrying spent nuclear fuel could be lower depending on factors such as the degree of fuel burn-up, the amount of post-irradiation cool-down time allowed before fuel shipment, and the amount of spent fuel being shipped. Because the dose rate can vary due to factors other than the fuel type, it is likely that shipments of MOX spent fuel and LEU spent fuel would have similar dose rates. Therefore, the impacts from shipping MOX and LEU spent fuel are expected to be similar under normal conditions. Accidents involving the shipment of spent fuel (which would reasonably represent the potential accident impacts from MOX spent fuel) are being considered in the *Yucca Mountain EIS* as described in response FR003–9.

FR003–11 **MOX RFP**

As discussed in response FR003–8, when spent fuel is initially removed from the reactor, the MOX and LEU fuel would be about the same temperature and exhibit similar characteristics. After about a year out of the reactor, however, the temperature of MOX spent fuel would exceed that of LEU fuel of the same age. Therefore, storage of MOX spent fuel would increase the thermal loading in a spent fuel pool over that for only LEU fuel. However, thermal load limitations are based on the amount of cooling that the entire spent fuel pool can accommodate, not on individual fuel assemblies within the pool. Therefore, the additional heat load would be accounted for in the calculations for the reactor spent fuel management plans.

The commentor has expressed a concern that MOX fuel in the reactor core might affect core cooling in the event of an extended loss of offsite power event. Each of the proposed nuclear units has two independent sources of offsite power capable of supplying power to the Engineered Safety Features, and two emergency onsite diesel generators as standby power sources should offsite power not be available. Each of the plant's extended shutdown capabilities has been evaluated, including during loss of offsite power and station blackout scenarios. As part of the safety analyses supporting the license amendment request to use MOX fuel, each licensee would reevaluate these scenarios to account for MOX fuel in the core, to ensure that the reactors can be safely shutdown and maintained in that mode for an extended period. Rigorous safety analyses and operational parameter assessments would be conducted, and a license amendment approved by NRC, prior to the use of MOX fuel in any reactor. Differences in neutron flux, decay heat, temperature of the fuel assemblies and other parameters that could affect reactor operation and core cooling, both during normal operation and postulated transients and emergencies would be considered in these analyses, and factored into operating and emergency procedures, as necessary. Changes in the amount of moderator, neutron poisons and other reactor control mechanisms and emergency systems would be made as necessary to ensure continued safe operation of the proposed reactors.

Two examples of loss of offsite power in the United States were noted by the commentor. On August 24, 1992, winds from Hurricane Andrew caused extensive damage to southern Florida, including offsite power supplies to the Turkey Point Nuclear Generating Station. Offsite power to Turkey Point was unavailable for 6 days. During that time period, the emergency diesel generators operated and provided power for essential systems, including spent fuel pool cooling.

On June 24, 1998, a tornado struck the Davis-Besse Nuclear Power Plant and caused damage to the electrical switchyard. As a result, offsite power to Davis-Besse was lost for approximately 24 hours. The emergency diesel generators operated and provided power for essential systems, including spent fuel pool cooling. The ambient room temperature for one of the diesel generators slightly exceeded the design limit, but the generator continued to run and supply its load.

In both cases severe external phenomena caused a loss of offsite power for an extended period of time, but plant systems responded as designed to provide decay heat removal. It should be noted that all U.S. nuclear power plants, including the mission reactors, are required to demonstrate to NRC that they can withstand a station blackout (loss of all AC power, including onsite emergency power) for at least 4 hours. Therefore, there is substantial margin in the ability to provide adequate cooling for spent fuel. The impact of incorporating a limited number of MOX spent fuel assemblies on the ability to provide for spent fuel pool cooling is expected to be negligible and to be reviewed by NRC, as appropriate, as part of the reactor-license amendment process.

FR003–12 **Waste Management**

As described in Section 4.28, the amount of additional spent nuclear fuel generated is estimated to range from approximately 2 to 16 percent of the total amount of spent fuel that would be generated by the proposed reactors during the time period MOX fuel would be used. The amount of additional spent fuel is not expected to change spent fuel management practices at the reactor sites. Spent fuel from the reactors would be moved to the spent fuel pool and later, if needed, to onsite dry storage. Ultimately, the spent fuel would be moved to a potential geologic repository prepared in accordance with the NWPA. As is current practice, the utilities would pay for any spent fuel storage needed at the reactor sites.

As described in response FR003–9, DOE is preparing a separate EIS on a potential geologic repository for HLW and spent fuel.

FR003–13 **Health Human Risk**

Under normal operating conditions, it is not expected that the waste streams and handling characteristics would change significantly from those associated with LEU fuel. Electricité de France reactors in France have seen little or no increased impacts on workers from the use of MOX fuel; accordingly, little or no increases in worker exposure would be expected.

FR003–14 **Human Health Risk**

There are minute releases of plutonium to the environment expected from the proposed surplus plutonium disposition facilities at SRS. These releases are presented in Appendix J and factored into the analysis presented in Chapter 4 of Volume I.

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PHYSICIANS FOR SOCIAL RESPONSIBILITY®
1101 Fourteenth Street Northwest Suite 700 Washington DC 20005

telephone (202) 898-0150
facsimile (202) 898-0172
email: psrnatl@psr.org
internet: www.psr.org

Physicians for Social Responsibility Comments
On the Supplement to the Surplus Plutonium Disposition
Draft Environmental Impact Statement
(DOE/EIS - 0283-DS, April 1999)

June 28, 1999

Physicians for Social Responsibility (PSR) is a national organization of approximately 15,000 members. We are the United States affiliate of the International Physicians for the Prevention of Nuclear War (IPPNW), winners of the 1985 Nobel Peace Prize. PSR was founded in the 1960's when we worked to end atmospheric nuclear testing by documenting the presence of Strontium 90 in children's teeth. PSR is committed to achieving the complete, verifiable elimination of nuclear weapons, and addressing the legacy of the Cold War. In that context, we urge the safe, secure disposition of plutonium. We oppose policies and efforts that would encourage the United States or other countries to use or proliferate this most lethal bomb material. 1

We support the stated goal of the Department of Energy's plutonium disposition program: *"[To] Reduce the threat of nuclear weapons proliferation worldwide."* We believe however, that the planned use of MOX in commercial reactors does not achieve this goal. Instead, we find that the MOX program fuels a worldwide plutonium economy, incurs unnecessary environment, safety, and health impacts and risks, wastes taxpayer money, and is not supported in the United States or worldwide. We are also concerned that DOE has not held public hearings in communities around the chosen reactor sites where citizens will be most directly impacted by this MOX program. 2

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U.S. AFFILIATE OF INTERNATIONAL PHYSICIANS FOR THE PREVENTION OF NUCLEAR WAR

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FR017–1 **Alternatives**

DOE acknowledges the commentor's concern that the MOX approach does not meet the surplus plutonium disposition program's goal. Use of MOX fuel in domestic, commercial reactors is proposed to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. DOE is not advocating a plutonium economy. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel) and therefore does not support building a plutonium economy.

FR017–2 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's request for extending the comment period and planning for additional public hearings in the three communities where the proposed reactors would use MOX fuel. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. In addition to the public hearing on the *Supplement* held in Washington, D.C., DOE provided other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Although it did not extend the comment period, DOE did consider all comments received after the close of that period. All comments were given equal consideration and responded to.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the

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MOX : Fueling a Plutonium Economy

We recognize the difficulty in negotiating with Russia on plutonium disposition issues. It is quite clear that Russia values plutonium as a fuel resource, intends to continue reprocessing activities, and would like to expand Russian use of breeder reactors. It seems however, that with our policy of pursuing a MOX program in parity with Russia, we have failed to exercise strong leadership. Real leadership on this issue would send a clear message to Russia and other countries that we are truly committed to our non-proliferation policies against reprocessing and could steer Russia and other countries away from reprocessing. Instead our policy has been a very confusing message, essentially saying to Russia and the world *"follow us, we're right behind you."*

While the DOE pays lip service to the United States policy on reprocessing (see box at right), in fact this current MOX program undermines that policy and supports a worldwide plutonium fuel economy.

> *"The United States does not encourage the civil use of plutonium and, accordingly, does not itself engage in plutonium reprocessing for either nuclear power or nuclear explosive purposes."* (President Clinton 1993)

Examples of how MOX supports a worldwide plutonium economy:

- **"Aqueous Polishing" required for the U.S. weapons-grade plutonium to be used as MOX fuel is a reprocessing activity.** When we asked where there was experience with Aqueous Polishing, the answer from Cogema representatives was that Aqueous Polishing is part of the current reprocessing activities at La Hague. Thus, it seems that DOE's assertion that *"the MOX approach does not involve reprocessing,"* is incorrect. (DOE Fact Sheet, *Surplus Plutonium Disposition and the U.S. Policy of Reprocessing*, June 14, 1999). 3

- **The United States supports a Japanese effort to assist Russia in burning MOX at the BN-600, a breeder reactor.** Not only does this encourage the use of breeder reactors in Russia, it furthers Japan's understanding and use of similar fast reactors. DOE Under Secretary Moniz has reported that the United States is very supportive of this effort. (Under Secretary Moniz, spoke at the *Nuclear Weapons Exchange/ Monitor Publications' Sixth International Policy Forum on the Disposition of Plutonium and HEU* on June 7, 1999. Russian policymakers and Japanese contractors also made presentations.)

- Support of the BN-600 use is troubling especially given that Russia does not believe that enough MOX can be burned in the currently available VVER light water reactors to reach plutonium disposition goals. **Instead, Russia would like to build and operate the BN-800 -another new breeder reactor. Will the United States support that effort in order to enable Russian parity with the U.S. MOX program?**

- **Russia is committed to a "closed fuel cycle," and intends to reprocess MOX spent fuel at some point.**

- **Cogema, chosen as the MOX fabricator in the DCS consortium carrying out the U.S. MOX program, is well known throughout the world for its reprocessing operations, as well as related reactor-grade MOX use.**

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FR017

proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. As pointed out by the commentor, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

It is DOE policy to encourage public input into these matters of national and international importance. DOE has followed the spirit of NEPA and has not neglected its responsibilities to the public. Since the inception of the fissile materials disposition program, DOE has supported a vigorous public participation policy. It has conducted public hearings in excess of the minimum required by NEPA regulations to engender a high level of public dialogue on the program. The office has also provided the public with substantial information in the form of fact sheets, reports, exhibits, visual aids, and videos related to fissile materials disposition issues. It hosts frequent workshops, and senior staff members make presentations to local and national civic and social organizations on request. For example, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina.

FR017–3 **Nonproliferation**

As discussed in response FR017–1, DOE is not proposing to reprocess spent nuclear fuel or support a plutonium fuel economy. DOE acknowledges the commentor's concerns regarding the disposition of surplus Russian plutonium as MOX fuel. The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials. The goal of surplus plutonium disposition program is to reduce the threat of nuclear weapons worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. This activity permanently removes nuclear materials from the military arena, and does not compromise the traditional separation between military and commercial uses of nuclear materials.

On the basis of public comments received on the SPD Draft EIS, and the analysis performed as part of the MOX procurement, DOE has included plutonium polishing as a component of the MOX facility to ensure adequate impurity removal from the plutonium dioxide. Appendix N was deleted from the SPD Final EIS, and the impacts discussed therein were added to the impacts sections presented for the MOX facility in Chapter 4 of Volume I. Section 2.18.3 was also revised to include the impacts associated with plutonium polishing. Plutonium polishing is not a reprocessing activity (it is performed on plutonium dioxide made from pits, not on spent reactor fuel) but rather a process that is used to remove impurities, in particular gallium, in order to meet the required plutonium dioxide feed specifications for MOX fuel.

The United States and the other G–8 nations (Group of Eight industrialized nations: Canada, France, Germany, Great Britain, Italy, Japan, Russia, and United States) are supporting plutonium disposition efforts, both financially and by providing technical assistance, in Russia because these countries consider it vitally important to ensure that weapons-usable nuclear material does not fall into the hands of terrorists or rogue states. Russia considers the plutonium a valuable resource that can be used for energy production. DOE will continue to discourage Russia from reprocessing its spent nuclear fuel and starting a plutonium cycle, but this issue and the issue of Japan assisting Russia in building a reprocessing facility are beyond the scope of the SPD EIS.

Should the decision be made to proceed with the hybrid approach, COGEMA, part of the team that would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel, would lend its expertise within the limits of the contract, which does not have any provisions for reprocessing.

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(Examples of MOX fueling a plutonium economy continued)

- **While DOE's stated intention is to shut down the MOX facility at the completion of the plutonium disposition mission, it would seem to be quite difficult to simply close down this large operation and infrastructure.** Thus, it is possible, if not probable, that the U.S. will continue to utilize the MOX process, eroding the once-through, no-reprocessing policy. 4

- **Use of MOX fuel in commercial reactors will forever blur to obliteration the line that the United States has maintained between military nuclear weapons processes and peaceful commercial nuclear power.**

Taken together these examples reveal the extent to which MOX and reprocessing are intrinsically related and serve to support the worldwide plutonium fuel economy, thereby undermining the non-proliferation goal of the plutonium disposition program. 3

MOX: A Public Safety & Health Risk

Plutonium is fairly characterized as one of the most lethal substances on earth. Any disposition method will pose inherent safety and health dangers to workers and the public. The DOE should make every effort to minimize those dangers.

> *"Plutonium . . . poses an extraordinarily dangerous threat to health as an emitter of alpha particles. Experiments in animals have demonstrated that plutonium is readily absorbed when inhaled as fine particles. Absorbed plutonium lingers in the body for decades. Major sites of retention include the lung, lymph nodes, liver, and bone, with relative distribution of the plutonium depending on its chemical form and entry route. Exposed animals develop high rates of cancer, primarily of the lung and bone, even when the dose of plutonium is small. Cell culture experiments suggest that such carcinogenesis may reflect a unique ability of alpha particles to cause inherited chromosomal defects from a minute amount of exposure."* Plutonium: Deadly Gold of the Nuclear Age, International Physicians for the Prevention of Nuclear War and The Institute for Energy and Environmental Research. 1992

Relative to the immobilization options, the MOX option presents additional risks and impacts. For example:

- **MOX requires more, transportation and multiple reactor locations.** Thus, more people and a broader environment are exposed to radiation and potential accidents in the fuel fabrication, transport, handling, and reactor use of plutonium. 5

- **Operation of MOX-fueled reactors risks greater harm than current uranium-fueled reactor operations.** The Nuclear Control Institute's recent study estimates that in the event of a severe loss of containment accident, releases from a reactor burning MOX fuel could cause from hundreds to thousands of additional cancer deaths among people exposed to the radioactive fallout. This is because MOX-fueled reactors contain greater quantities of radioisotopes including plutonium, americium, and curium than do reactors using uranium fuel. (*Public Health Consequences of Substituting Mixed-Oxide for Uranium Fuel in Light-Water Reactors*, Edwin S. Lyman, PhD, **Nuclear Control Institute,** January 21, 1999.) 6

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FR017–4 **DOE Policy**

Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. DOE will evaluate options for D&D or reuse of the proposed facilities at the end of the surplus plutonium disposition program. However, none of the current plans include using the facility to continue to manufacture MOX fuel.

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard as discussed in response FR017–1. Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

FR017–5 **MOX Approach**

The health and safety of workers and the public is a priority of the surplus plutonium disposition program, regardless of which approach is chosen. Operation of the proposed surplus plutonium disposition facilities would comply with applicable Federal, State, and local laws and regulations governing radiological and hazardous chemical limits. Within these limits, the level of exposure would be kept as low as is reasonably achievable. Chapter 5 summarizes the environmental statutes, regulations, and permits that cover emissions, waste, and ALARA standards.

DOE has considered the inherent risks, including terrorist concerns, associated with transporting plutonium materials. While DOE prefers to minimize the transportation of plutonium that is still desirable for weapons use, plutonium is routinely and safely transported in the United States. As described in Appendix L.3.3, transportation of nuclear materials would be performed in accordance with all applicable DOT and NRC transportation requirements. Interstate highways would be used, and population centers avoided, to the extent possible.

All shipments of surplus plutonium that have not been converted to a proliferation-resistant form would be made by DOE's SST/SGT system, as described in Appendix L.3.2. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material. While it is true the MOX approach requires more transportation with regard to shipping the MOX fuel from the fabrication facility to the reactors, and then eventually shipping the MOX spent fuel to the potential geologic repository, each shipment would follow strict procedures using licensed equipment and in compliance with applicable requirements. A quantification of the risks associated with the various transportation scenarios is presented in Chapter 4 of Volume I by alternative and summarized in Section 2.18.

FR017–6 **Facility Accidents**

Section 4.28.2.5 provides a discussion of the analysis of several reactor accidents including both design basis and beyond-design-basis accidents. For MOX fuel, as compared to LEU fuel, there is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48,000 per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

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(MOX: A Public Safety & Health Risk continued)

- **While much is made of the operational experience with MOX reactors in Europe, these reactors abroad are using reactor-grade MOX fuel with much more plutonium-239.** U.S. weapons-grade plutonium fuel is different and unique, and even requires the additional Aqueous Polishing step. 7

- **The operational experience in Europe is irrelevant without adequate information about the health, safety and environment records of those operations.** The record of Cogema's operations should be disclosed to the public. We were pleased to note at the June 15 Public Meeting that at least some of this information will be posted on the web. The full environment, safety and health record of Cogema's reprocessing activities, along with its MOX experience, should be made available to the public. 8

MOX: An Expensive Option

- **Subsidies to Russia.** Achieving Russian plutonium disposition is a goal that we support. Thus we do not object to funding for this effort, and indeed have communicated our support to Congress in the past. We wonder however, why the U.S. cannot be more persuasive in directing the Russian programs. Instead, the U.S. approach is to fund and pursue MOX which seems to lead inevitably to reprocessing and breeder reactor use in Russia. Lawmakers including Jesse Helms (R-NC), Chair of the Senate Foreign Relations Committee, have raised serious concerns about the MOX program in Russia. Any program that does not have the clear support of Congress risks losing needed financial support. PSR cannot support funding for a plutonium disposition program with Russia that so heedlessly pursues MOX in the face of crucial non-proliferation concerns. 3

- **Subsidies to U.S. Utilities.** *"There will be small savings to the utility company's customers for the use of partial MOX fuel reloads."* (DOE Fact Sheet *"The Economics of the Plutonium Disposition Contractual Arrangement,"* June 14, 1999). The same fact sheet lists the costs covered by the DOE (which is funded by taxpayers), including the licensing expenses of the Nuclear Regulatory Commission and all modifications to the MOX mission reactors. While funding assistance to Russia may be needed even with other plutonium disposition options, taxpayer subsidies to the utilities and their customers is a unique cost of the U.S. MOX program. It is impossible to tell how "small" this subsidy is without full disclosure of the cost figures. The full costs of the entire MOX program should be disclosed to the public. We were pleased to note that access to at least a redacted form of the DOE- DCS MOX contract was made available at the June 15 Public Meeting, and hope that further cost information will be disclosed throughout the process. 4

- **Exclusive focus on the MOX option may endanger Congressional funding and support for plutonium disposition. Sufficient funding for the immobilization option is critically important.** In the political, competitive budget atmosphere of the U.S. Congress, it is important that steady plutonium disposition progress is made in order to maintain solid funding support for the program. Even proponents of MOX realize that MOX is not an option for all of the surplus plutonium. Some plutonium wastes will have to be immobilized. Moreover, especially because MOX is a new process in the U.S., delays and glitches are to be expected, and complete failure is a possibility. We are concerned that if money is poured into MOX, there may not be sufficient funding in later years to pursue immobilization or other options. 9

Physicians for Social Responsibility Comments on the SPDEIS Supplement (DOE/EIS-0283-DS) Page 4 of 5

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FR017–7 **MOX Approach**

Reactor fuel in Europe is fabricated to similar enrichment levels (about 5 percent plutonium 239) to the levels being proposed for the U.S. reactors that would be used to irradiate MOX fuel.

Fabricating MOX fuel from surplus weapons-usable plutonium should have less impact than fabricating MOX fuel from spent nuclear fuel. At the La Hague Plant in France, COGEMA is reprocessing spent nuclear fuel to recover the plutonium. Because spent fuel is highly radioactive, it presents a series of unique hazards that need to be carefully dealt with. The La Hague Plant includes a series of processes to remove highly radioactive fission and activation products from the spent fuel. The MOX process being evaluated in this SPD EIS does not involve reprocessing. The proposed U.S. MOX facility would handle plutonium that is unirradiated. Therefore, the radiation exposures and emissions normally associated with reprocessing spent nuclear fuel would not be present in the proposed MOX facility.

The remainder of this comment regarding plutonium polishing is addressed in response FR017–3.

FR017–8 **MOX RFP**

European reactors of various designs use MOX fuel. European nuclear regulatory authorities in France, Germany, Belgium, the Netherlands, and Switzerland have reviewed MOX fuel use in reactors of varying designs. Recent reports prepared by the French Government have concluded that the radioactive releases from the La Hague Plant are not the cause of an excess childhood leukemia in the area of the plant between 1978 and 1996. As discussed in response FR017–7, the La Hague Plant is a spent fuel reprocessing plant. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing so a plant like La Hague would not be needed for the MOX approach.

In this regard, questions on environment, safety and health records of COGEMA can be directed to Ms. Christi A. Byerly. Her address is: 7401 Wisconsin Avenue; Bethesda, MD 20814. She may also be contacted by telephone at (301) 941-8367. Her fax number is (301) 652-5690, and

PHYSICIANS FOR SOCIAL RESPONSIBILTY
KATHRYN A. CRANDALL
PAGE 7 of 9

MOX: Unsupported by Citizens Worldwide

As we push for nuclear disarmament progress, PSR believes that it is especially important that plutonium disposition efforts be supported by citizens worldwide. If people feel that plutonium disposition methods are dangerous and waste money, they may be less willing to support nuclear disarmament efforts in the first place. There is much opposition to MOX in Russia, the United States and other countries. The ***"Statement of Non-Governmental Organizations on Plutonium Disposition"*** submitted at the June 15 Public Meeting, was signed by over 160 citizen's groups worldwide. This is the latest evidence that there is opposition to MOX throughout the world. 9

Public hearings should be held in the reactor communities.

DOE officials have stated that they would *"consider public hearings"* in the reactor communities. (Office of Fissile Materials Disposition (MD) Director Laura Holgate stated this at the *Nuclear Weapons Exchange/ Monitor Publications' Sixth International Policy Forum on the Disposition of Plutonium and HEU* on June 8, 1999, and MD Reactor Group Director Dave Nulton echoed this at the Public Meeting on June 15.) We strongly urge DOE to extend the comment period and ***plan*** hearings in the three communities where reactors will use MOX fuel.

PSR does recognize that the DOE has held a number of hearings throughout this Environmental Impact Statement process, and many of our members have participated in these hearings. We strongly believe, however, that DOE has an obligation to hold hearings in the communities where reactors have been identified. Hearings have not been held in these communities. The citizens in these areas feel that failure to hold hearings in their communities is a gratuitous slap in the face. DOE is asking them to carry the largest burden of risk and impact for its disposition program, but does not even have the courtesy to go hear directly the concerns and questions people have. 2

While it is true that the Nuclear Regulatory Commission will license the reactors, and public hearings will likely be held by the NRC, this does not discharge DOE's responsibility. It is DOE's plutonium disposition mission, DOE has the contract with DCS, and it is DOE that is paying for the NRC licensing processes. Therefore, it is DOE's responsibility to hold hearings in the most affected communities at this time. We look forward to knowing when and where those hearings are planned.

Thank you very much for considering our written comments, and we do appreciate the efforts of the DOE Office of Fissile Materials Disposition at the June 15, 1999 Washington DC Public Meeting.

Comments prepared for Physicians for Social Responsibility by
Kathryn A. Crandall, JD
Associate Director for Security Programs
Tel: (202) 898 0150 ext. 222
E-Mail: Kcrandall@psr.org

FR017

her email address is cbyerly@cogema-inc.com. You can also visit their Web site linked from the MD Web site at http://www.doe-md.com or directly at http://www.cogema.com.

FR017–9 **DOE Policy**

DOE acknowledges the commentor's observation that there is worldwide opposition to the MOX approach given the statement signed by over 160 citizen's groups. As discussed in response FR017–3, the disposition actions proposed are reasonable alternatives developed and analyzed to address the goals of the surplus plutonium disposition program. One of the advantages of pursuing the hybrid approach, which involves both immobilization and MOX fuel, is flexibility in meeting program goals and agreements reached with Russia should one of the approaches run into schedule delays. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. Should the decision be to proceed with the hybrid approach, construction and operation of the pit disassembly, immobilization, and MOX facilities would effectively occur simultaneously so there would be no threat of running out of funds to pursue immobilization. As shown in Appendix E, the immobilization would begin operating a year before the MOX facility was to begin cold startup operations.

ASHEVILLE
CITIZEN-TIMES

Tuesday, March 23, 1999

GUEST COLUMN

A global plutonium economy flourishes at our doorstep

By Lewis Patrie
and Olga Pitsunova

We are writing to express our dismay about the proposed use of plutonium fuel both in the United States and Russia. Many U.S. citizens don't realize that environmental activists have been operating in Russia at their peril since before the break up of U.S.S.R. Recently, we took part in a lively discussion among six courageous Russian activists and many local community members who discussed nuclear issues on the UNCA campus.

Last December Secretary of Energy Bill Richardson identified the Savannah River Site in South Carolina as the preferred location to receive 50 tons of surplus plutonium from nuclear warheads from various locations around the country where most of it would be converted into plutonium fuel for use as fuel in nuclear power plants. Any day now the U.S. Department of Energy expects to contract with a consortium which includes French fabricator, Cogema, Virginia Power and Duke Power; the latter would accept MOX for use in its McGuire and Catawba reactors near Charlotte.


Lewis Patrie


Olga Pitsunova

Concurrently, the United States is promoting the use of plutonium fuel in Russian nuclear reactors. It would be U.S. money offered to conduct an initial experiment in the use of weapons grade plutonium fuel at the Balakovskaya Nuclear Power Station along the bank of the Volga River near Balakovo. The United States is promoting use of this fuel in many other Russian locations. Russian activists want U.S. citizens to know that plutonium plants in both countries are connected and that this movement signals the beginning of a global plutonium economy.

Our concerns about plutonium fuel include the billions of dollars for fabricating this fuel, transporting it to nuclear plants, offering it at no cost to power companies, future inestimable subsidies to the industry and the costs of promoting Russian fuel use. We dread even more that the characteristics of this fuel make it less stable than current fuel for reactor use, increasing the risk of a sever reactor accident and increasing the anticipated effects on human health should one occur. Such an event could ultimately result in many cancer deaths within 1000 miles of the accident.

Using pure plutonium fuel, the Nuclear Control Institute, a U.S. watchdog organization, estimates about doubles the cancer deaths from the radiation exposure within the first week of such an accident compared with nuclear fuel currently being used.

Although, DOE minimizes the risk of a disaster, reminiscent of Chernobyl, there are sufficient data to suggest that use of plutonium increases that risk.

Plutonium fuel substantially increases the waste management problem. Problems of security and nuclear proliferation are also increased with the use of plutonium fuel. Environmental problems from plutonium will linger for more than 200,000 years. For the sake of our world and that of our children, we should tell our governments that plutonium should never be used as fuel.

Olga Pitsunova is Program Director of the Center for Assistance to Environmental Initiatives in the Saratov region of Russia. The main goals of the organization are to encourage cooperation among environmental groups in the Saratov region and to encourage initiatives to protect and restore the environment.

Lewis Patrie is President of Western North Carolina of Physicians for Social Responsibility.

FR017

The Rock Hill Herald
Sunday, March 28, 1999

MOX Fuel

Should weapons-grade plutonium be used in nuclear reactors?

By Brita Larsen Clark and Kate C. Boniske
Special to The Herald

If you are like us, you may have no idea what MOX stands for. We have leaned only recently about this new development and what it means for our communities.

The U.S. Department of Energy (DOE) has developed a plan to combine surplus weapons-grade plutonium with uranium to produce fuel for civilian nuclear reactors. the fuel is called mixed oxide fuel, hence MOX. The Catawba II reactor, near Rock Hill, would be one of first to use this new and so far experimental fuel.

We all want to get rid of surplus plutonium, but is this a good way to do it? The more we learn, the more doubts surface.

When concerned groups asked the DOE to hold public hearings in communities such as Rock Hill, they were turned down. The public, however, has not only the right but also the responsibility to be involved in any policy decisions with such serious implications for our health and the health of future generations.

Clark

Our concerns about using MOX fuel are many. Here are some that directly affect those of us who make our homes in the Southeast:

◆ Weapons-grade plutonium never has been used in commercial reactors. They were not designed to use this fuel and would need extensive modifications.

◆ MOX fuel generates more high energy particles than uranium, and the rate of damage to key reactor parts would be accelerated.

◆ Increased energy also increases core temperatures, which increases fission, which in turn creates more heat in a cycle that makes the reaction harder to control.

Boniske

◆ Plutonium fission creates dangerous radioactive elements. Uranium "spent" fuel is about a million times more radioactive than fresh fuel (it is not "spent" at all; it becomes too highly irradiated to use) and MOX is even more dangerous.

◆ A just-released study by the Nuclear Control Institute finds that a severe accident at a reactor fueled with MOX could cause twice as many fatal cancers as an identical accident

please see MOX, page 3E

MOX

from 1E

at a uranium-fueled reactor.

◆ Plutonium not only causes cancers, it also is highly likely to disrupt reproductive cells, causing mutations that can show up in future generations.

◆ Processing warhead plutonium pits into MOX (which would be done at the Savannah River Plant near Aiken) would create huge amounts of high-level nuclear waste.

◆ MOX means transporting plutonium by truck and/or rail to the Savannah River Plant for reprocessing. It then must be sent out again to the selected reactor sites. This presents serious security risks regarding the possibility of theft or diversion, as well as the potential for accidents en route.

◆ MOX will not use up our stockpiles of plutonium. Though a small amount will be expended in energy production, plutonium also will be created in the process, along with a host of other toxic elements. Of even greater concern, weapons still could be made from the irradiated "spent" fuel, undermining the point of using plutonium in the first place.

These are just a few of the issues regarding MOX that we believe need a public airing. As concerned parents and grandparents, we are distressed to think that Duke Energy, long known as a responsible member of the utility industry, would consider using MOX fuel in its Catawba and McGuire reactors.

We call on Duke Energy and the DOE to join with concerned citizens in organizing public forums where we can ask questions and give our input.

For more information on MOX in the southeast, contact the Blue Ridge Environmental Defense League (336) 982-2691, or Nuclear Information and Resource Service, (202) 328-0002. We have also relied on information published by the Institute for Energy and Environmental Research, whose e-mail is *http://www.ieer.org*, and the Nuclear Control Institute, *http://www.nci.org//nci/*.

Brita Clark and Kate Boniske both joined a roundtable discussion with members of The Herald's editorial board. Clark, of Candler, N.C., is active in the organization Physicians for Social Responsibility. Boniske, of Arden, N.C., is a longtime member of the Women's International League for Peace and Freedom.

FR017

SAFE ENERGY COMMUNICATION COUNCIL
LINDA GUNTER
PAGE 1 OF 4

Keep in touch
James Werrell
opinion page editor
Phone: 329-4081 Fax: 329-4021
Email: jwerrell@heraldonline.com
Website: www.heraldonline.com

Viewpoint

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The Herald
Sunday, March 28, 1999

MOX Fuel

Top article only read

Should weapons-grade plutonium be used in nuclear reactors?

read verbatim

By Brita Larsen Clark and Kate C. Boniska
Special to The Herald

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please see MOX, page 3E

1

There's a better alternative

By Arjun Makhijani and Edwin Lyman
Special to The Herald

The United States and Russia must take action to reduce the risk from the vast surpluses of weapons-usable plutonium in both countries. It must be put into non-weapons-usable form, so as to keep it out of potential nuclear black markets. There are two ways to do this, and the jobs will, in any case, come to the Southeast.

One of the methods, the use of surplus plutonium as a fuel in commercial reactors, will increase environmental risks and proliferation dangers. That is the one that the Department of Energy (DOE) has chosen for most U.S. surplus plutonium. The fuel, consisting of a mixture of plutonium and uranium oxides (mixed oxide or MOX fuel), would be fabricated at the Savannah River Site (SRS) in South Carolina.

Last week, the DOE awarded a $130 million contract to design a nuclear power plant that can convert plutonium from decommissioned nuclear weapons into a fuel that would power its reactors. The contract went to an international consortium that includes Duke Energy, owner of the Catawba Nuclear Station in Lake Wylie and the McGuire reactors in North Carolina.


Makhijani

In recognition of the risks of MOX fuel use, the United States has, for more than two decades, had a bipartisan policy of not using plutonium as a fuel in commercial reactors. But the need to put the surplus plutonium into non-weapons-usable form has created a new opportunity for plutonium fuel advocates.

There is a simpler, faster and cheaper method for dealing with weapons plutonium: mixing it with radioactive wastes and encapsulating it in molten glass, which also could be carried out at SRS, without the risks attendant on the use of plutonium fuel. Yet, the DOE plans to use this only for plutonium not suitable for fabrication into fuel.


Lyman

Putting plutonium fuel into commercial circulation would require the militarization of commercial nuclear power plants to store the plutonium safely. It would require amending the licenses of the plants, which may need expensive modifications. It would make waste management more difficult and expensive. MOX fuel use also would require unnecessary plutonium transport.

Perhaps the most serious concerns

please see NUCLEAR, page 3E

DCR003

DCR003–1 **Alternatives**

DOE acknowledges receipt of the commentaries that question the MOX approach.

The Herald
Sunday, March 28, 1999

Viewpoint 3E

MOX

from 1E

at a uranium-fueled reactor.

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These are just a few of the issues regarding MOX that we believe need a public airing. As concerned parents and grandparents, we are distressed to think that Duke Energy, long known as a responsible member of the utility industry, would consider using MOX fuel in its Catawba and McGuire reactors.

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Nuclear

from 1E

for people living downwind of the Catawba and McGuire reactors are the potential consequences of an accident in a reactor using MOX fuel. MOX-fueled reactors contain greater quantities of hazardous radioisotopes, including plutonium, americium and curium, than do plants using uranium fuel. A recent Nuclear Control Institute study estimates that in the event of a severe loss-of-containment accident, the higher releases of these isotopes from a plant using MOX could cause from hundreds to thousands of additional cancer deaths among people exposed to the radioactive fallout.

The DOE has tried to allay these concerns by pointing to countries such as France that use MOX fuel in some of their reactors. But the MOX experience abroad is not based on weapons-grade plutonium, which contains significantly more plutonium-239 and hence requires more stringent reactor control arrangements. The DOE also has failed to inform the public about the 1997 test in France in which a MOX fuel rod violently ruptured under simulated accident conditions while a uranium fuel rod with similar characteristics did not.

Finally, the MOX approach would mean that U.S. taxpayer dollars would be used to subsidize the creation of an infrastructure for commercial plutonium fuel use in this country and in Russia. Black-market dangers in Russia will only increase and proliferation problems will be aggravated by such a reversal of longstanding U.S. policy.

This poor plutonium policy is being accompanied by bad process. The DOE has not held hearings in the communities that host the reactors that would likely use the MOX fuel, nor even in Washington, D.C. Further, U.S. subsidiaries of two corporations, Cogema, owned by the French government, and British Nuclear Fuels, owned by the British government, would be intimately involved at SRS. The former is the likely contractor for the MOX plant; the latter is set to become part owner of Westinghouse, the SRS site contractor.

The DOE has not required these companies to make public their full operating safety, health and environmental records in their home countries. Yet they claim that extensive plutonium experience in their home countries especially qualifies them to do sensitive nuclear work in the United States.

Both Cogema and BNFL have polluted the environment in their home countries. Their plutonium separation operations are the subject of protest not only by environmentalists but also by other governments of the European Union, which have asked them to greatly reduce discharges of radioactivity, which are contaminating seafood.

Before letting a contract for MOX to Cogema or allowing BNFL to have a central role in operating SRS, the DOE should hold hearings in the Southeast and in Washington, D.C. on all relevant issues, including the home country records of Cogema and BNFL. All corporations that want public money, whether they are Cogema or Duke, should make all safety, health and environmental records public. (Much of Duke's record is already public via its disclosures to state and federal regulators.)

In the meantime, the region's public and policy-makers should withhold their support of the MOX program, which would introduce unnecessary environmental and proliferation risks and complicate the job of plutonium disposition.

Dr. Arjun Makhijani is president of the Institute for Energy and Environmental Research in Takoma Park, Md. Dr. Ed Lyman is scientific director of the Nuclear Control Institute in Washington, D.C. Both participated in a roundtable discussion with The Herald's editorial board regarding the use of MOX fuel.

1

DCR003

Opinion

The Herald
Sunday, March 28, 1999

2E

Our view

Let's take a closer look at MOX fuel proposal

In summary

◆ Opponents of plan raise disconcerting questions.

Last week, the U.S. Department of Energy gave the go-ahead to an international consortium led by Duke Energy to develop a plan for the use of weapons-grade plutonium in nuclear reactors. We worry that this plan is hurtling forward with virtually no attempt to educate the public about the potential hazards or to seek public reaction to the plan.

The use of what may be the most dangerous substance on the globe would occur at the Catawba Nuclear Station near Lake Wylie. It would be transported here overland from the Savannah River Site in Aiken County.

We have been reassured by Duke Energy officials and by others in the industry that the process is safe. They say it has been implemented successfully in Europe. And they point to an excellent safety record at Catawba and other nuclear plants in the consortium.

Proponents also maintain that providing a commercial use for plutonium will encourage other nations, notably Russia, with stockpiles of the material to use it in reactors. And, they say, unless plutonium is degraded in reactors, there is no way to keep it out of evil hands over its 100,000-year lifespan.

But others in the scientific community dispute both the safety claims and the efficacy of "burning" plutonium in nuclear plants to reduce stockpiles. These critics are not simply radical "anti-nuke" activists; they are doctors and scientists with the right credentials.

For example, Dr. Arjun Makhijani, who wrote a commentary that appears on the cover of today's Viewpoint section, is president of the Institute for Energy and Environmental Research. His Ph.D thesis was on controlled nuclear fusion, and he has served on an Environmental Protection Agency subcommittee on national radiation cleanup standards.

What both sides do agree on is the pressing need to render the nation's stockpile of plutonium to its least harmful state and keep it out of the hands of terrorists who could use it to build nuclear weapons. Where they disagree is over the best way to accomplish that.

The plan approved by the DOE last week calls for the plutonium to be turned into fuel that could be used in reactors. Mixed oxide fuel, commonly referred to as MOX, is made by mixing uranium oxide and plutonium oxide and placing the material in fuel "rods" for commercial use.

Rods would be shipped from the Savannah River Site by trucks or rail. Security details would be required to ensure the shipments weren't hijacked.

Industry officials say using MOX to generate electricity in nuclear plants would consume a significant portion of the plutonium and degrade the remainder, making it harder to use as a nuclear weapon. Eventually, they claim, this method would reduce the U.S. stockpile of surplus plutonium and help generate energy in the process.

Critics, however, claim, the conversion of plutonium to MOX fuel would produce hundreds of gallons of liquid radioactive waste. Furthermore, only a small portion of the plutonium is "burned" away in reactors and the fission process that occurs in the reactor actually creates more plutonium. And 1

DCR003

finally, used MOX fuel is much more radioactive and difficult to handle than normal uranium waste.

Opponents of the MOX program say the nation's weapons-grade plutonium should be encased in molten glass and stored in a secure area. Immobilization, they say, would be a quicker, less expensive and more efficient way to make this substance inaccessible.

Before buying industry claims that use of MOX fuel is both safe and economical, the public should demand answers to the concerns posed by opponents of this program. They claim that:

- ◆ An accident at a reactor using MOX fuel would pose a far greater danger of contamination and resulting cancer deaths of residents living near the plant.
- ◆ Transporting plutonium would be more difficult and dangerous than transporting uranium.
- ◆ Customers would enjoy no savings on fuel bills as a result of the use of MOX fuel.
- ◆ Workers at nuclear plants would be at higher risk.
- ◆ Commercial use of weapons-grade plutonium would encourage Russia and other nations to produce more plutonium.
- ◆ The bulk processing of plutonium would make it more difficult to account for the whereabouts of this dangerous material.
- ◆ An accident in which plutonium "went critical" would be more difficult to contain than one involving uranium fuel.
- ◆ The cost of refitting plants to accept MOX fuel would reduce or completely negate any savings in fuel costs.

These are just a few of the issues raised by opponents of the MOX fuel plan. Perhaps the Department of Energy and the nuclear power industry have answers for all of them.

To date, however, those answers have not been forthcoming. Nor has the industry offered to conduct forums to educate the public about its intention to use plutonium fuel. 1

Too much is at stake, especially for a community located so close to a nuclear power plant. The assurance that the Catawba Nuclear Station has a sterling safety record and that its engineers are convinced of the safety of this program is not enough.

The public needs to know more before it can endorse this controversial program.

DCR003

SAFE ENERGY COMMUNICATION COUNCIL
LINDA GUNTER
PAGE 1 OF 3

SECC

Safe Energy Communication Council
1717 Massachusetts Ave., NW
Suite 106
Washington, D.C. 20036
TEL: (202) 483-8491
FAX: (202) 234-9194
www.safeenergy.org

Statement of
Linda Gunter, Communications Director
Safe Energy Communication Council

Date: June 22, 1999
To: United States Department of Energy,
Office of Fissile Materials Disposition.

Overall, commercial nuclear power is already uneconomical, environmentally damaging and dangerous. Its future looks bleak. All new reactors ordered in the United States since 1974 have subsequently been canceled. No new reactors have been ordered since the accident at Three Mile Island 20 years ago. In fact, more than 100 reactors planned or under construction, have been canceled. In poll after poll, U.S. voters are clear: Americans want taxpayers' money spent on renewable energy options, not nuclear power, which already produces vast quantities of radioactive waste without a safe, permanent storage solution. This year, the Washington International Energy Group (WEIG), an industry think tank, released its **1999 Electric Industry Outlook** which found that 80 percent of utility CEOs and managers surveyed said no new nuclear power plants will be ordered in North America. In January, 1999, Steven Fleischman, Utilities Analyst for Merrill Lynch, predicted that no more nuclear reactors would be constructed in the U.S. Therefore, nuclear power has failed on Main Street, Wall Street and in the executive suites. 1

Using weapons plutonium – whose only purpose was supposed to be, and has hitherto been for bombs – in commercial reactors is even more uneconomical and even more dangerous. Furthermore, it is unnecessary. There is a safer, cheaper, faster alternative – immobilization – puts this dangerous material away forever. The U.S. Department of Energy (DOE) has agreed to immobilize up to 17 tons of surplus weapons plutonium, although we suspect the only reason is because it is unsuitable for Mixed Oxide fuel (MOX). However, the Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement acknowledges that all of the surplus weapons plutonium could be immobilized. 2

So why pursue MOX at all? Why run such needless security, environmental and health risks to support a program that will prop up a 3

–more–

MR011

MR011–1 **Other**

DOE acknowledges the commentor's view that commercial nuclear power has a bleak future in the United States.

MR011–2 **Alternatives**

DOE acknowledges the commentor's opposition to the use of weapons-grade plutonium in MOX fuel and irradiating it in commercial reactors. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

DOE does not agree that the MOX approach is inherently more dangerous than the immobilization approach. DOE and NAS have conducted studies to compare risks, including the nuclear material security and proliferation risks of alternatives analyzed in this SPD EIS. These studies include the *Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Materials Storage and Excess Plutonium Disposition Alternatives* (DOE/NN-0007, January 1997), *Proliferation Vulnerability Red Team Report* (SAND97-8203, October 1996), *Management and Disposition of Excess Weapons Plutonium* (NAS, 1994), and *Management and Disposition of Excess Weapons Plutonium, Reactor-Related Options* (NAS, 1995). As discussed in Section 4.28.2.5, studies by NAS have led it to the following conclusion: "no important overall adverse impact of MOX use on the accident probabilities of the LWRs involved will occur; if there are adequate reactivity and thermal margins in the fuel, as licensing review should ensure, the main remaining determinants of accident probabilities will involve factors not related to fuel composition and hence unaffected by the use of MOX rather than LEU fuel."

The environmental, safety and health consequences of the MOX approach at the proposed reactors are addressed in Section 4.28. In addition, NRC would evaluate license applications and monitor the operations of both the MOX facility and domestic, commercial reactors selected to use MOX fuel, to ensure adequate margins of safety.

As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach would be more expensive than the immobilization-only approach. However, as discussed, pursuing the hybrid approach provides the United States important insurance against potential disadvantages of implementing either approach by itself.

Operation of the proposed surplus plutonium disposition facilities is expected to take approximately the same amount of time for either the immobilization-only approach or the hybrid approach. The difference in timing for the hybrid approach is associated with the amount of time that MOX fuel would be irradiated in domestic, commercial reactors.

MR011–3 **Nonproliferation**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

Safe Energy Communication Council
Linda Gunter
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Statement from Linda Gunter, SECC
June 22, 1999
Page 2

mature industry rapidly going the way of the dinosaurs? The DOE's response so far has been that we should address these concerns to the Nuclear Regulatory Commission (NRC). SECC asked questions specifically about security issues at a recent NRC public meeting. We were referred to a second NRC meeting the following week where, we were assured, security would be at the top of the agenda. But at that subsequent meeting we were told in no uncertain terms right at the start that we would not be allowed to ask questions, nor would we be permitted to make statements. Furthermore, not only was security not at the top of the agenda, it wasn't on the agenda at all. So much for the myth of an open, thorough public hearing process at the NRC. 4

Again we ask, why pursue the MOX option? Let us not be fooled by the Duke-Cogema-Stone & Webster (DCS) Consortium's assertions that it is for the good of the country and the noble cause of non-proliferation. Using MOX will end non-proliferation as we know it and increase the risk of nuclear-weapon proliferation by countries and, more seriously, by terrorist organizations. 3 In reality, DCS is endorsing the MOX program for the usual reason – money. Its utilities, Duke Power and Virginia Power, will be paid to use MOX, which is the only way it is financially feasible for them. And who will have to shoulder the burden of this handout? We, the people. The American taxpayer. 5

We urge the DOE to abandon this needless waste of government time and public money on the MOX program. The Department should instead focus on immobilization and safe storage while allowing the nuclear power industry to continue in the direction in which it is already appropriately proceeding, toward an orderly phaseout. 2

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MR011

In order to address security against terrorist-related incidents, all intersite shipments of plutonium for the surplus plutonium disposition program would be made using DOE's SST/SGT system. This involves having couriers that are armed Federal officers, an armored tractor to protect the crew from attack, and specially designed escort vehicles containing advanced communications equipment and additional couriers. Further, DOE does not anticipate the need for any additional security measures at reactor sites, other than for the additional security applied for the receipt of fresh fuel. Commercial reactors currently have armed security forces, primarily to protect against perimeter intrusion. There would be increased security for the receipt and storage of fresh MOX fuel, as compared with that for fresh LEU fuel, for additional vigilance inside the perimeter. However, the increased security surveillance would be a small increment to the plant's existing security plan. After irradiation, the MOX fuel would be removed from the reactor and managed with the rest of the spent fuel from the reactor, eventually being disposed of at a geologic repository built in accordance with the NWPA.

MR011–4 **General SPD EIS and NEPA Process**

NRC's public outreach policies are beyond the scope of this SPD EIS, however, since the inception of the U.S. fissile materials disposition program, DOE has supported a vigorous public participation policy. All interested parties would likely have the opportunity to submit comments during the NRC reactor license amendment process should the MOX approach be selected.

MR011–5 **MOX Approach**

The MOX approach is not intended to affect the viability of nuclear power generation at any particular reactor. DCS would not have to continue to use MOX fuel if it determined that it was uneconomical to operate the reactor. Furthermore, DCS would only be reimbursed for costs solely and exclusively related to the MOX fuel irradiation. This would ensure that the taxpayers were not underwriting otherwise uneconomical electricity-generating assets.
~~~~~

Good Morning
My name is Ann with WAND -- Women's Action for New Directions, a national organization educating women to act politically. We also represent women state legislators in all 50 states through our project Women Legislators Lobby (WiLL).

WAND was founded in 1980 as Women's Action for Nuclear Disarmament and has worked toward nuclear arms reductions for nearly 20 years. We are encouraged that at long last some nuclear weapons are being dismantled -- we hope there are many more to come. We also support the goals of the Clinton Administration and the Department of Energy to dispose of the plutonium from these weapons in such a way that they may never again be used in a weapon of mass destruction.

We are deeply concerned, however, with the DOE's approach to plutonium disposition and strongly disagree that converting some plutonium into fuel for commercial power plants is the proper way to proceed. We feel the full balance of the 50 tons of declared surplus plutonium should be immobilized and isolated from the environment for safety, environmental, and proliferation reasons. 1

Fabricating MOX fuel and using it in commercial reactors in South Carolina, North Carolina and Virginia will require unnecessary and excess transportation of plutonium, primiarly across the southeastern United States. WAND has active grassroots members and state legislators in these primary states.

While we hear repeated assurances that the plutonium will be transported "safely," it is important to remember that ANY shipment of plutonium involves risk, and the MOX option maximizes that risk. 2

DCR009

DCR009–1 **Alternatives**

DOE acknowledges the commentor's opposition to converting some of the surplus plutonium into MOX fuel and irradiating it in commercial reactors. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

The safety, health, and environmental consequences of the MOX approach at the proposed reactors are addressed in Section 4.28. In addition, NRC would evaluate license applications and monitor the operations of both the MOX facility and domestic, commercial reactors selected to use MOX fuel, to ensure adequate margins of safety.

DOE and NAS have conducted studies to compare risks, including the nuclear material security and proliferation risks of alternatives analyzed in this SPD EIS. These studies include the *Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Materials Storage and Excess Plutonium Disposition Alternatives* (DOE/NN-0007, January 1997), *Proliferation Vulnerability Red Team Report* (SAND97-8203, October 1996), *Management and Disposition of Excess Weapons Plutonium* (NAS, 1994), and *Management and Disposition of Excess Weapons Plutonium, Reactor-Related Options* (NAS, 1995).

DCR009–2 **Transportation**

DOE has considered the inherent risks, including terrorist concerns, associated with transporting plutonium materials. While DOE prefers to minimize the transportation of plutonium that is still desirable for weapons use, plutonium is routinely and safely transported in the United States. As described in Appendix L.3.3, transportation of nuclear materials would be performed in accordance with all applicable DOT and NRC transportation requirements. Interstate highways would be used, and population centers avoided, to the extent possible.

All shipments of surplus plutonium that have not been converted to a proliferation-resistant form would be made by DOE's SST/SGT system, as described in Appendix L.3.2. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material.

The MOX option also maximzes cost, waste generation, and potential worker exposure to plutonium as it involves far more processing than the immobilization option. It will require the construction of a MOX Fabrication Factility at the Savannah River Site, which is already highly contaminated and has will take many decades to clean up, if it can, in fact, ever be cleaned up. 3

We are particularly concerned about the impact of the use of MOX in commercial reactors on the surrounding communities. The people living near these reactors, who will not have the benefit of speaking directly on this matter as DOE has refused to hold hearings in their communities, will bear the brunt of any accident involving MOX fuel. Yet they have not been adequately informed of the risk they are being asked to take on. 4

WAND represents women legislators and grassroots activists living within 50 miles of these reactors. [[[Kim: reactor locations are: McGuire reactor, 10 miles north of Charlotte, NC; the Catawba reactor, about 6 mi. south of Charlotte; and the North Anna reactor in Mineral, VA, kind of between Richmond and Fredericksberg. Can you find members in these areas?]]]

They are concerned, as we are, that:

* a severe accident at one of these reactor sites using MOX fuel, would result in far greater consequences with many more deaths and injuries than if such an accident occurred with conventional uranium fuel.

* using MOX fuel in the reactor will cause embrittlement and premature aging of the reactor, compromising safety 5

*since MOX fuel is made from WEAPONS plutonium (and not commercial

DCR009

DCR009–3 **MOX Approach**

As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach would be more expensive than the immobilization-only approach. However, pursuing the hybrid approach provides the United States important insurance against potential disadvantages of implementing either approach by itself as discussed in response DCR009–1.

Cleanup at SRS is a priority, will remain a priority, and can coexist with other DOE initiatives. The surplus plutonium disposition program would be conducted in a way which ensures that cleanup remains a priority at SRS and that the production of any additional waste is processed and disposed of in a timely and environmentally acceptable manner.

As described in Chapter 4 of Volume I and summarized in Section 2.18, potential impacts of any of the proposed activities during routine operations at any of the candidate sites would likely be minor. To avoid contamination that has occurred in the past at some DOE sites, DOE would design, build, and operate the proposed surplus plutonium disposition facilities in compliance with today's environmental, safety, and health requirements. Furthermore, any accidental releases would be promptly addressed following established policies and procedures by trained personnel.

DCR009–4 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's concern that the people living near the proposed reactors that would use MOX fuel are not getting to speak directly on this matter in a public hearing held in their community. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. DOE provided other means for the public to express their concerns and provide comments. Also, at the invitation of South Carolina State Senator Phil Leventis, DOE attended and participated in a public hearing held on June 24, 1999, in Columbia, South Carolina.

The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

For those interested parties who could not attend the hearing on the *Supplement* held in Washington, D.C., on June 15, 1999, DOE provided various other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Equal consideration was given to all comments, regardless of how or where they were received.

DCR009–5 **Facility Accidents**

While it is understood that there are differences from the use of MOX fuel versus LEU fuel, these differences are not expected to change the frequency of severe accidents in MOX-fueled reactors. Because differences between MOX fuel and uranium fuel are well characterized, they can be accommodated through fuel and core design. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by the reactor plant operators as part of their license amendment applications.

Reactor vessel embrittlement is a condition in which the fast neutron fluence from the reactor core reduces the toughness (fracture resistance) of the reactor vessel metal. Analyses performed for DOE indicated that the core average fast flux in a partial MOX fuel core is comparable to (within 3 percent of) the core average fast flux for a uranium fuel core. All of the mission reactors have a comprehensive program of reactor vessel analysis and surveillance in place to ensure that NRC reactor vessel safety limits are not exceeded.

WOMEN'S ACTION FOR NEW DIRECTIONS
ANN OBER
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plutonium) it is therefore an experimental fuel --and neither DOE, Duke Energy,
Virginia Power, Cogema, nor any other DOE subcontractor have a full understanding of how this fuel will behave in a reactor. The fact is, it has never before been used on a commercial scale and tests done at the labroatory 5
scale indicate we have much, much more to learn about this volitile fuel.

* MOX fuel made from weapons plutlonium will make the reactor harder to
control safely. We know "it can be done," but we also know the margin of safety is narrowed with the use of MOX fuel.

* the nuclear industry will receive huge, as-yet undisclosed subsidies and incentive fees for its participation in this program. 6

*storage of MOX fuel at reactor sites will be a security problem, as plutonium in MOX fuel can be extracted fairly easily and used in a weapon, making it very attractive to steal. Reactor sites are not set up to handle this kind of security situation. 7

* We are also concerned about plutonium fuel transportation and the impact on our communities and our children of heavily armored vehicles carrying
plutonium fuel moving through our town's streets and highways.

At the very least, communities that must face these risks should have the opportunity to speak for themselves and ask questions to you directly about this risky program. We are dismayed that you have robbed them of that chance. 4

We also feel the MOX program is costly and dangerous, puts people at risk unnecessarily, and undermines the efforts of WAND and so many others to reduce
the threat of nuclear weapons in the world. Your plan would provide the funds 8
and infrastructure for a plutonium economy, which only worsens environmental
and nuclear proliferation problems. It is particularly troubling that you are

DCR009

Section 4.28.2.5 provides a discussion of the analysis of several reactor accidents including both design basis and beyond-design-basis accidents. For MOX fuel, as compared to LEU fuel, there is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48,000 per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

The fabrication of MOX fuel and its use in commercial reactors has been accomplished in Western Europe. This experience would be used for disposition of the U.S. surplus plutonium. Electricité de France reactors in France have seen little or no impact from the use of MOX fuel on radionuclide releases in effluents. No change would be expected from normal operations, given that MOX fuel performs as well as LEU fuel and the fission products are retained within the fuel cladding. FRAGEMA's (a subsidiary of COGEMA and FRAMATOME) experience with fabricating MOX fuel indicates a leakage rate of less than one-tenth of 1 percent. FRAGEMA has provided 1,253 MOX fuel assemblies, with more than 300,000 fuel rods for commercial reactor use. There have been no failures and leaks have occurred in only 3 assemblies (a total of 4 rods). All leaks occurred as a result of debris in the reactor coolant system and occurred in 1997 or earlier. French requirements for debris removal were changed in 1997 to alleviate these concerns. Since that time, there have been no leaks in MOX fuel rods. Further, as discussed in response DCR009–1, NRC would evaluate license applications and monitor the operations of the commercial reactors to ensure adequate margins of safety.

DCR009–6 **MOX Approach**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this

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ANN OBER
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pursusing this option when a cheaper, safer, more environmentally sound option
exists that does not encourage plutonium use and production in the US, Russia
and beyond. We implore [encourage? you to discard the MOX option and immobilize
all surplus plutonium as quickly and safely as possible. 8

Thank you for considering our comments.
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DCR009

proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

DCR009–7 **Nonproliferation**

DOE does not anticipate the need for any additional security measures at reactor sites, other than for the additional security applied for the receipt and storage of fresh fuel. Commercial reactors currently have armed security forces, primarily to protect against perimeter intrusion. There would be increased security for the receipt and storage of fresh MOX fuel, as compared with that for fresh LEU fuel, for additional vigilance inside the perimeter. However, the increased security surveillance would be a small increment to the plant's existing security plan. After irradiation, the MOX fuel would be removed from the reactor and managed with the rest of the spent fuel from the reactor, eventually being disposed of at a geologic repository built in accordance with the NWPA.

In order to address security against terrorist-related incidents, all intersite shipments of plutonium for the surplus plutonium disposition program would be made using DOE's SST/SGT system. This involves having couriers that are armed Federal officers, an armored tractor to protect the crew from attack, and specially designed escort vehicles containing advanced communications equipment and additional couriers.

The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in Appendix L. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

DCR009–8 **DOE Policy**

DOE is not advocating a plutonium economy. Rather, as discussed in response DCR009–6, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel) and therefore does not support building a plutonium economy.

The remainder of this comment is addressed in response DCR009–1.

Casa Maria

CATHOLIC WORKER HOUSE
OF HOSPITALITY

1131 N. 21st Street P.O. Box 05206
Milwaukee,WI 53205 Phone: 344-5745

US Dept. of Energy
Office of Fissile Materials Disposition
PO Box 23786
Washington DC 20026-3786

6-8-99

Dear Friends,

There is no real reason for dealing with deadly plutonium. There are alternative sources of energy that can be used for our energy. One of the problems is that corporations cannot make money on these alternative sources of energy. This, of course, is the reason why we do not adopt these sources. 1

The problem with radioactive waste, the product of plutonium, is that we still do not have a safe and adequate way of storing the waste. 2 We are not leaving much of a future for our children and their children with this constant use of plutonium as a source of energy.

Unless we take the time, effort and cost of using alternative forms of energy other than plutonium there will be a slow and painful death for most Americans. You have the choice. You either give in to the corporations and continue to use plutonium or help to save lives with alternative sources of energy. 1

Thank you for your attention.

Sincerely,

Don Timmerman

MR004

MR004–1 **Purpose and Need**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. Use of MOX fuel is not proposed as an alternative energy source nor in order to subsidize the commercial nuclear power industry.

The issue of spending the time and resources to develop alternative forms of energy is beyond the scope of this SPD EIS.

MR004–2 **Repositories**

This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository. The immobilized plutonium and MOX spent fuel are included in the inventory analyzed in that draft EIS should the decision be made to proceed with the hybrid or immobilization-only approaches.

The public doesn't need the plutonium in the reactors in Mecklenberg County. We have enough pollution. I would like to see my grandchildren grow up without cancer from the plutonium in the air. 1

The U.S. Department of Energy (DOE) presumes in this environmental impact statement (EIS) that anything meeting the regulatory requirements is justified. Yet the International Commission on Radiological Protection, in the formation of its recommendations on allowable exposures, states that one must come up with a justification for a practice first, then find out if it meets the regulations. This means that a standard or regulation cannot be used as the justification, yet that is all the public is given. The public cannot be expected to compare what happens in different reactors using different fuels and what are the outcomes. 2

I find it very interesting that the litany of concerns I have raised in previous meetings is almost quoted in the sections on process materials, but without supporting data and analysis. There is, moreover, no mention of nuclear laundries in terms of a comparison for fission products. Are those products increased in a laundry that is serving a plutonium fuel reactor or not? Questions such as these are basic; they relate to information the public has a right to know but has not received. That tritium is elevated is something that I have heard, but I can't go anywhere in this document and find that. 3

WASHDC–1 **Reactors**

Section 4.28 was revised to discuss the potential environmental impacts of operating Catawba, McGuire, and North Anna, the reactors that would use the MOX fuel. There would be no expected releases of plutonium from the proposed reactors occurring from normal operating conditions. Annual doses to an MEI at each of the plants are estimated to be small—i.e., McGuire, 0.31 mrem; Catawba, 0.73 mrem; and North Anna, 0.37 mrem. All of these doses fall within stringent NRC 10 CFR 20 and 10 CFR 50 regulatory requirements and are much lower than radiation annually received from natural background sources.

WASHDC–2 **Human Health Risk**

In Volume I the need for the proposed actions are summarized in Chapter 1. Within this chapter the "justification behind the proposed actions" is discussed in detail. Subsequently, in Chapter 4, analytical results are presented which are then compared against radiation protection standards. In essence, this approach is parallel with ICRP recommendations.

Section 4.28 presents an analyses of the impacts expected if MOX fuel were used in the proposed reactors. In the case of accidents, there are direct comparisons of the impacts of a partial MOX fueled reactor versus a traditional LEU core. Also doses from normal operations of the proposed reactors are compared to the current doses as presented in the affected environment section in Chapter 3 of Volume I.

WASHDC–3 **Human Health Risk**

Under normal operating conditions, it is not expected that there would be any change in nuclear laundries due to the use of MOX fuel at the proposed reactors. The laundries could be affected in either of two cases. If there were a fresh fuel assembly received at the reactor sites that had a cladding defect and contamination on the outside of a rod, the anti-contamination clothing would have a higher alpha-contamination with MOX fuel than it would with LEU fuel. However, since the cladding is sealed and inspected as a pressure boundary at the MOX facility prior to shipment and the fuel is transported in specifically designed packages, the likelihood that a rod would be ruptured

I am concerned as to the clear and present danger of this material. I am concerned about my grandchildren. We can spend a lot of time arguing about this. As I see it, however, we have to do something with this material other than store it. We need to put this material in a form that makes it unavailable for weapons use. The United States is not talking about reprocessing the spent fuel; it is talking about doing something with the separated plutonium. I have not heard any positive editorials read today, although some people have expressed agreement with use of the North Anna plant. 4

This process is reprehensible. It is clear that the main driver of the dual-track approach is access by nuclear corporations to taxpayer dollars. The decision had been made well before it was announced. This makes people mad—not only people in the communities of the reactors but also those giving their taxpayer dollars. Taxpayers do not want to have to give money to the largest debiting corporations in the world; they see the main issue as not that this program is better or that it accomplishes its goals, but that nuclear corporations need money. 5

when received at the reactor sites is remote. The other case that could result in a different radioisotopic inventory is if a MOX fuel rod failed in service and a different radioisotopic inventory were communicated to the reactor purification system and then this was somehow communicated to a worker's protective clothing. Both Virginia Power Company and Duke Power Company use onsite laundries for re-usable anticontamination protective clothing. The laundry water is filtered and then released in accordance with effluent release regulations and site permits. Alpha contamination, indicating the presence of actinides, is very low and far below regulatory limits. The same condition is expected to hold true for partial MOX fuel cores.

As shown in Table K–27, by the end of core life, the presence of tritium is expected to decrease by 5 percent when a partial MOX core is used.

WASHDC–4 **Purpose and Need**

DOE acknowledges the commentor's concern regarding the clear and present danger of surplus plutonium. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. Section 4.28 was revised to discuss the potential environmental impacts of operating Catawba, McGuire, and North Anna, the reactors that would use the MOX fuel.

WASHDC–5 **MOX Approach**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective

It is clear DOE can't meet its obligations, in particular the obligation to hold full and open public hearings. The local community will not have the information it needs if you don't talk to them. 6

I have a question about storage of plutonium at the Savannah River Site (SRS). I have heard that DOE is deferring construction of the Actinide Processing and Storage Facility (APSF) facility at SRS. I understand that plutonium would be stored in the K-Reactor building. If this program turned out to involve longer-term storage and the mixed oxide (MOX) fuel program did not go forward, could the goal of long-term storage be accomplished by the K-Reactor building alone—that is, without a dedicated facility? 7

value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract.

DOE has identified as its preferred alternative the hybrid approach for the disposition of U.S. surplus plutonium, it is not a decision. Decisions on the surplus plutonium disposition program will be made in the SPD EIS ROD based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input.

WASHDC–6 General SPD EIS and NEPA Process

Since the inception of the fissile materials disposition program, DOE has supported a vigorous public participation policy. It has conducted public hearings in excess of the minimum required by NEPA regulations to engender a high level of public dialogue on the program. The office has also provided the public with substantial information in the form of fact sheets, reports, exhibits, visual aids, and videos related to fissile materials disposition issues. Efforts were made to contact persons living near the selected reactor sites and inform them of the proposed use of MOX fuel. The *Supplement to the SPD Draft EIS* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Additionally, various means of communication—mail, a toll-free telephone and fax line, and a Web site (http://www.doe-md.com)—have been provided to facilitate the public dialogue. It is DOE policy to encourage public input into these matters of national and international importance.

WASHDC–7 Alternatives

In August 1998, DOE amended the *Storage and Disposition PEIS* ROD to allow for the receipt and storage of non-pit, surplus weapons-usable plutonium at SRS, in advance of the completion of APSF. If DOE selects SRS

Have the problems with Defense Waste Packaging Facility processing material caused the Office of Fissile Materials Disposition to rethink the immobilization technique? 8

as the immobilization site in the SPD EIS ROD, current plans are to ship material from RFETS to SRS and store it in shipping containers in Building 105–K (K Reactor) beginning in about 2000; material from Hanford would be shipped to SRS and stored in APSF. Before storage, the material would first be stabilized and packaged for long-term storage in accordance with DOE Standard-3013-96, *Criteria for Preparing and Packaging Plutonium Metals and Oxides for Long-Term Storage.*

Building 105–K is currently undergoing modifications to provide for the safe, secure storage of the RFETS surplus plutonium per decisions made in the amended *Storage and Disposition PEIS* ROD. These modifications include upgrades to safeguards and security features, installation of criticality monitoring devices, and removal of unused process equipment. DOE would also expand APSF, as planned in the *Storage and Disposition PEIS* ROD, to accommodate the storage of Hanford surplus plutonium pending disposition. Should DOE decide to build and operate APSF at SRS, a portion of the RFETS material could be transferred from Building 105–K to APSF in order to provide for operational flexibility. If APSF is not built, the development of additional storage space in Building 105–K or in other DOE facilities could be necessary in order to provide for storage of the balance of surplus plutonium materials; such an action would only be done after an appropriate NEPA review was completed.

WASHDC–8 Alternatives

DOE is presently considering a replacement process for the in-tank precipitation (ITP) process at SRS. The ITP process was intended to separate soluble high-activity radionuclides (i.e., cesium, strontium, uranium, and plutonium) from liquid HLW before vitrifying the high-activity fraction of the waste in DWPF. The ITP process as presently configured cannot achieve production goals and safety requirements for processing HLW. Three alternative processes are being evaluated by DOE: ion exchange, small tank precipitation, and direct grout. DOE's preferred immobilization technology (can-in-canister) and immobilization site (SRS) are dependent upon DWPF providing vitrified HLW with sufficient radioactivity. DOE is confident that the technical solution will be available at SRS by using radioactive cesium from the ion exchange or small tank precipitation process. A supplemental EIS (DOE/EIS-0082-S2) on the operation of DWPF and associated ITP alternatives is being prepared.

Will any expected failures of the fuel rod process be considered in the licensing process? 9

Is there any known analysis of the radionuclide profile of low-level waste (LLW) generated during operations with plutonium fuel at the proposed reactors? 10

WASHDC–9 **MOX RFP**

FRAGEMA's (a subsidiary of COGEMA and FRAMATOME) experience with fabricating MOX fuel indicates a leakage rate of less than one-tenth of 1 percent. FRAGEMA has provided 1,253 MOX fuel assemblies, with more than 300,000 fuel rods for commercial reactor use. There have been no failures and leaks have occurred in only 3 assemblies (a total of 4 rods). All leaks occurred as a result of debris in the reactor coolant system and occurred in 1997 or earlier. French requirements for debris removal were changed in 1997 to alleviate these concerns. Since that time, there have been no leaks in MOX fuel rods.

WASHDC–10 **Waste Management**

No, there are not any current analyses of the radionuclide profile of LLW generated during operations with MOX fuel at the proposed reactors. There are differences in fission product inventories and activation products between an LEU and MOX core during a fuel cycle. However, the only time significant quantities of fission products could be released to the environment or end up in LLW would be in the event of a large-scale fuel leak. In regard to normal operations, FRAGEMA's (a subsidiary of COGEMA; one of the companies chosen to operate the proposed MOX facility) experience with fabricating MOX fuel indicates a leakage rate of less than one-tenth of 1 percent. FRAGEMA alone has provided 1,253 MOX fuel assemblies, with more than 300,000 fuel rods for commercial reactor use. As previously discussed, there have been no failures and leaks have occurred in only 3 assemblies (a total of 4 rods). FRAGEMA has also produced 43,826 LEU assemblies over the years and has experienced leaks in only 471 assemblies.

The use of MOX fuel would not be expected to result in any additional LLW from refuelings because the reactors would continue to operate on the same schedule as if they were using only LEU fuel. Before any LLW would be shipped from the reactors to a disposal site, analyses would be performed to ensure that the concentrations of radioisotopes fall within regulatory limits. All of the proposed reactors will continue to operate within stringent NRC (10 CFR 20) radionuclide release and dose requirements.

Because radioisotopic profiles are linked to fuel rod failure, any additional information on such failure in other countries would be helpful. 11

In regard to high-level nuclear waste repositories, what differences are known to exist between low-enriched uranium (LEU) fuel and MOX fuel at the point where they become what we call high-level nuclear waste? It seems to me that there is not enough information on such waste and its effects on the program? 12

On page K–3 of the EIS, the curium 244 fraction is given as 0.94, when it should be over 2. Also, the chart shows no delayed neutron precursors, in particular those of the bromine series; they should be added. The chart also does not show all of the reactor poisons, specifically samarium, nor all fission product gases. The buildup of these gases could lead to a bursting of the fuel rods. The tritium fraction should also be included, as should any other fraction of gases produced in quantity. 13

WASHDC–11 **Facility Accidents**

This comment is addressed in response WASHDC–10.

WASHDC–12 **Repositories**

This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository. As described on page 2–2 of the *Yucca Mountain Draft EIS*, immobilized plutonium and MOX spent fuel generated by the surplus plutonium disposition program are included in the inventory analyzed in that draft EIS should the decision be made to proceed with the hybrid or immobilization-only approaches. Section A.2.4.5.1 of the *Yucca Mountain Draft EIS* describes the expected material characteristics of MOX spent fuel from the surplus plutonium disposition program including: mass and volume, amount and nature of radioactivity chemical composition, thermal output, and physical parameters. Section A.2.1.5 describes similar characteristics for commercial LEU spent fuel.

WASHDC–13 **Facility Accidents**

The curium 244 inventories shown in Appendix K were extracted from the output for the ORNL Isotope Generation and Depletion Code (ORIGEN) cases. Because the rate of curium 244 production is strongly dependent on burnup, it has a higher inventory level in LEU assemblies that are left in the reactor for three cycles than MOX assemblies that are left in the reactor for a maximum of two cycles. As a result, at the end of a cycle the ratio of curium 244 in a 40 percent MOX core would be about 6 percent lower than the ratio of curium 244 in an LEU core because more of the LEU core would be made up of assemblies that have been used for three cycles (33 percent of the core versus 20 percent of the core for the proposed MOX core).

It is true that burnups of 40 GWD/t or more result in higher fission gas production than LEU fuel at the same burnup. However, this does not automatically result in higher doses from reactors operating with MOX fuel. MOX fuel assemblies are engineered to accommodate this additional gas. In the event of a leaker, the gas is released into the reactor coolant and scrubbed through a series of filters that capture nearly all of the radionuclides so that any impact on dose would be expected to be small. Appropriate MOX fuel burnup limits would be established in concert with NRC following a thorough safety review. It should be noted that reactors in Belgium and Germany typically use MOX fuel to burnups between 45 and 50 GWD/t and that while current French burnup limits are lower than that, French burnup limits for LEU fuel are also lower than those for U.S. reactors.

This SPD EIS analyzes offsite consequences and risks in terms of LCFs and/or prompt fatalities. Previous studies have determined that certain radioisotopes are primary contributors to offsite consequences due to their effects on humans and the environment. These radioisotopes are included in Table K–27. Radioisotopes bromine 87 through bromine 91 and iodine 137 through iodine 141 are not included in Table K–27 because they are not significant contributors to offsite consequences. Bromine 87 through bromine 91 and iodine 137 through iodine 141 are delayed neutron precursors with half-lives of less than 1 minute. They were included along with the hundreds of other isotopes in the ORIGEN analysis done to support this EIS.

Xenon 135, the most important reactor poison, with a thermal absorption cross-section 60 times greater than samarium 149 is included in Table K–27. Samarium 149, a stable (nonradioactive) isotope, is not included because it is not a significant contributor to offsite consequences.

Tritium is a significant contributor to offsite consequences. The MOX/LEU ratio for tritium was calculated to be 0.95. Since this value is lower for the MOX core than an LEU core, the current analysis is conservative with respect to tritium.

I have a real objection to similar statements presented on pages 33 and K–2. The statement on page 33 reads as follows: "Although it has been suggested that the frequency of these accidents would be higher with mixed oxide fuel, no empirical data is available to support this." I have been trying to give you this information, the use of MOX fuel would involve a lower delayed neutron fraction; faster neutrons due to the higher thermal neutron absorption cross-section of plutonium, meaning a higher average neutron speed and thus both a reduction in control rod worth (a safety impact) and a shorter reactor period; different temperatures coefficients of reactivity; and more gas production, thus higher releases. 14

In Section 4.28.2.1 (page 31) of the EIS, it is stated that the estimated air pollutants resulting from operation of the proposed reactors would not be expected to increase due to the use of MOX fuel. It is my understanding that the gas production of MOX fuel is much higher—not just tritium, but also xenon and krypton—so I would assume that statement to be incorrect. I would like for you to respond to that. 15

WASHDC–14 **Facility Accidents**

The commentor states that MOX fuel will have a lower delayed neutron fraction, harder neutron spectrum, lower control rod worth, a shorter reactor period, different reactivity coefficients, and higher gas generation rate. These are all factual statements. These parameters require that the nuclear core designers accommodate these differences using verified and validated codes that incorporate these affects. Such nuclear codes have been used successfully in Europe and would be adopted and utilized by fuel designers in the United States. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by the reactor plant operators as part of their license amendment applications pursuant to 10 CFR 50.

WASHDC–15 **Air Quality and Noise**

Section 4.28.2.1 discusses nonradiological air impacts of the proposed irradiation of MOX fuel. Radiological impacts are discussed in Section 4.28.2.4 which indicates that the radiation dose to the general public from normal operations would not be expected to change with the use of MOX fuel in the selected reactors.

For normal operating conditions, the emissions are the same. The only emission stream that might result from using MOX fuel that would result in a different radioisotopic mix than LEU fuel occurs in the event that there is a MOX fuel failure, in which there is an emission pathway from the core. Given the history and integrity of fuel, a failure may never occur during the limited fuel campaign to get rid of surplus plutonium. Notwithstanding, if there were a MOX fuel failure, the effect on the radioisotopic inventory in emissions would be practically indistinguishable because: (1) the inventories in MOX and LEU fuel are similar (as shown in Table K–27), and (2) the contribution of fuel failures to the total emissions from the reactor is small (other contributions to the site's effluents dominate).

In the last public meeting in Amarillo, I asked what exactly the temperature fuel coefficient of reactivity response curve is. I received no response, so I submitted a card again. 16

Plutonium has a lower melting point, which will reduce safety; the higher decay heat of spent nuclear fuel would seem to increase the likelihood of a waste accident; and concerns as to the criticality of MOX fuel in storage would appear to justify greater concern as to the risks of spent MOX fuel in storage. 17

WASHDC–16 **Facility Accidents**

DOE is unsure what the commentor means by "temperature fuel coefficient of reactivity." DOE suspects that the commentor is interested in either the Doppler coefficient or the moderator temperature coefficient. For core designs similar to the ones DOE expects at the mission reactors, DOE has some illustrative data to provide. Moderator temperature coefficients are more negative for MOX cores than LEU cores. The beginning of life value for an "equilibrium MOX core" is approximately -12 pcm/F, which is more than twice as negative as the LEU number, which is about approximately -5 pcm/F. The temperature coefficient becomes more negative as a function of burnup and approximately linearly changes as a function of burnup until a burnup of approximately 20 GWD/t with a value of approximately -35 pcm/F. At this burnup, the coefficients for MOX and LEU merge and are approximately the same. (ANRCP-199-1, *Disposition in Weapons-Grade Plutonium in Westinghouse Reactors*, March 1998.) In the original question related to Doppler coefficient, DOE has an illustrative estimator of the parameter from *The Plutonium Disposition Study, Implementation of Weapons-Grade MOX Fuel in Pressurized Water Reactors* (Westinghouse Electric Corporation, August 30, 1996). At 100 percent power, the coefficient for an "equilibrium" MOX core is approximately -8.5 pcm/ percent-power which is slightly more negative than an LEU core at approximately -7.7 pcm/percent-power. These numbers are extracted from design studies performed under contract or grant from DOE for representative Westinghouse cores and may not be precise indicators for the actual mission reactors or mission fuel cycles. These more negative temperature coefficients would act to shut the reactor down more rapidly during a heatup transient.

WASHDC–17 **Facility Accidents**

The plutonium in MOX fuel would be present as plutonium dioxide in ceramic-like fuel pellets, not elemental plutonium. Plutonium dioxide has a significantly higher melting point than pure plutonium metal. In any case the melting point of MOX fuel would be within the specifications for that type of reactor fuel.

Initially, when spent fuel is removed from the reactor, the MOX and LEU fuel would be about the same temperature and exhibit similar characteristics.

I was glad to see that the *Supplement* does not suggest, as original data suggested, that health effects go down—that is, that plutonium is good for local communities. However, I don't see any reflection of the information received at the Canadian meeting a month ago. At that meeting, the head of the regulating body acknowledged that alpha radiation may in fact have a quality factor of 2,000, not 20, which is what the U.S. Nuclear Regulatory Commission (NRC) provides for us. Credible work shows that the presence of plutonium in a reactor would double the impacts of a reactor accident. There are, however, no voices from the communities to let you know how they feel. 18

After about a year out of the reactor, however, the temperature of MOX spent fuel would exceed that of LEU fuel of the same age. Therefore, storage of MOX spent fuel would increase the thermal loading in a spent fuel pool over that for only LEU fuel. However, thermal load limitations are based on the amount of cooling that the entire spent fuel pool can accommodate, not on individual fuel assemblies within the pool. Therefore, the additional heat load would be accounted for in the calculations for the reactor spent fuel management plans.

Although the amount of fissile material would be higher in MOX spent fuel rods than in LEU spent fuel rods, rod spacing and boron content in the spent fuel pools would be adjusted as necessary to maintain criticality safety.

WASHDC–18 **Facility Accidents**

The latest published version of 10 CFR 20.1004 (January 1, 1999) states that the quality factor for alpha particles is 20. This regulatory criteria (10 CFR 20) is established by NRC, and is therefore the official benchmark from which U.S. nuclear utilities are continually governed in the realm of radiation protection.

This SPD EIS analyzed several reactor accidents, including both design basis and beyond-design-basis accidents. For MOX fuel, as compared to LEU fuel, there is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. Both of these accidents have an extremely low probability of occurrence. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

Efforts were made to contact persons living near the selected reactor sites and inform them of the proposed use of MOX fuel. The *Supplement to the SPD Draft EIS* was mailed to those stakeholders who requested it as well as

When the dual track was announced, I asked if anyone had looked into the impacts of reactor irradiation of plutonium fuel on the LLW from reactor operations, and the resulting impacts on the destination of that LLW, the low-level radioactive waste dump. An example would be the impact on Ward Valley of a waste stream from Palo Verde. Ward Valley has not been designated as an LLW site but could well be within the time allotted. A major concern as to Ward Valley is how much plutonium would be going into the site and whether it would jeopardize the Colorado River. Government officials and the citizens of South Carolina are concerned that Barnwell is leaking. 19

There is a need for analysis of DOE's new—and currently contested—standard on the release of contaminated metals to consumer products. What about effects of the release of metals from facilities using MOX rather than LEU fuel on consumer products developed from recycled metals? The public doesn't have the information it needs on this matter. 20

to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. DOE provided various means for the public to express their concerns and provide comments: public hearing, mail, a toll-free telephone and fax line, and the MD Web site. Further, the communities near the proposed reactors and all other interested parties will likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

WASHDC–19 **Waste Management**

As described in Section 4.28.2.2, the volume of LLW generated at the reactor sites is not expected to increase as a result of the reactors using MOX fuel. There are differences in fission product inventories and activation products between an LEU and MOX core during a fuel cycle. However, as discussed in response WASHDC–10, the only time significant quantities of fission products could be released to the environment or end up in LLW would be in the event of a large-scale fuel leak. The amount of radioactivity that can be received at commercial LLW disposal sites is determined through the NRC licensing process for the particular site (e.g., Barnwell). This licensing process considers potential impacts on the environment near the disposal unit. Reactor wastes are only accepted if they meet the waste acceptance criteria of the disposal site. The LLW generated at the proposed reactors that would use MOX fuel is expected to meet the waste acceptance criteria.

WASHDC–20 **Waste Management**

The reactors proposed for MOX fuel irradiation would not be operated by DOE. The reactors would continue to be operated by the utilities and regulated by NRC. Eventual D&D of the reactors, which may include recycling of metals, would be performed by the utilities in accordance with NRC regulations in force at that time. However, it is premature to assume that scrap metal at the reactors would be recycled as part of D&D.

I would like to see a table comparing the wastes associated with the use of MOX versus LEU fuel and another comparing the MOX and immobilization approaches to surplus plutonium disposition. This table would make matters clearer for the public. The public would see that the MOX approach involves more steps and thus more opportunities for something to go wrong, more expense, and more waste streams. The taxpayer dollar spent on these processes goes to someone, and it represents a kind of nuclear welfare. I think that the energy producers are going to start noticing that in a deregulated market some people are getting a handout. 21

The environmental analysis does not state the positive health and safety impacts of substituting MOX fuel for the LEU fuel. Once MOX fuel is used, you will see that the impacts of using LEU are worse. This will not clean up our entire area, but it will make an improvement. I wish everyone would look at both side of the issue and make a mature decision. 22

Is DOE planning to conduct a public meeting next week in Russia? Have public meetings ever taken place in Russia? 23

WASHDC–21 **Alternatives**

This SPD EIS does not evaluate MOX, by itself, versus immobilization. Rather, this EIS evaluates hybrid alternatives (i.e., both immobilization and MOX) and immobilization-only alternatives. All of the surplus plutonium would not be made into MOX fuel because of the complexity, timing, and cost that would be involved in purifying the material to make it suitable for fabrication. A simple comparison of these approaches at the same site can be observed by comparing Alternative 2 to Alternative 11A in Table 2–4. This EIS does, however, look at the differences in operating the reactors with LEU and MOX fuel. Section 4.28 indicates that there is very little difference in the potential impacts of reactor operation, including waste generation, using MOX fuel in place of up to 40 percent of the LEU assemblies as proposed.

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

WASHDC–22 **MOX Approach**

Section 4.28.3 was added to this SPD EIS to show an estimate of the environmental impacts that would be avoided if MOX fuel was substituted for LEU fuel at the proposed reactors.

WASHDC–23 **General SPD EIS and NEPA Process**

DOE has no plans to hold a public hearing in Russia and has not held any public hearings there on this subject.

Why has DOE not held any meetings at any of the reactor communities? 24

The citizens of the United States do not have access to the radionuclide profile analysis from France. Under the National Environmental Policy Act (NEPA) process what can be done to enable public review of that information? What other information is being discussed that the public does not have access to? 25

WASHDC–24 **General SPD EIS and NEPA Process**

After careful consideration of its public involvement opportunities, including availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on *the Supplement to the SPD Draft EIS*. DOE felt there were sufficient other means provided for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Efforts were made to contact persons living near the selected reactor sites and inform them of the proposed use of MOX fuel. The *Supplement* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. For those interested parties who could not attend the hearing on the *Supplement* in Washington, D.C., on June 15, 1999, DOE provided the various other means discussed above for the public to express their concerns and provide comments. Further, interested parties will likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

WASHDC–25 **General SPD EIS and NEPA Process**

In accordance with CEQ implementing regulations (40 CFR 1506.6(f)), DOE has provided copies of reports and documents used in the preparation of this SPD EIS in DOE reading rooms and made them available on their Web site at http://www.doe–md.com. The radionuclide profile analysis referred to by the commentor was not used in this EIS but may be available from COGEMA. Information on COGEMA's environmental record can be found on their Web site at http://www.cogema.com or by contacting Ms. Christi A. Byerly. Her address is: 7401 Wisconsin Avenue; Bethesda, MD 20814. She may also be contacted by telephone at (301) 941-8367. Her fax number is (301) 652-5690, and her email address is cbyerly@cogema-inc.com.

I am confused as to where DOE is in the NEPA process. Has the public been given the information needed to assess the dual-track approach. Is it DOE's opinion that the public will be able to compare and comment on the impacts of the immobilization-only and dual-track approaches? 26

The affected communities have been ignored by DOE, NRC, and Duke. We are tired of being ignored. All you want to do to us is dump on us and use us. The public does not know about these issues and is being deceived. 27

WASHDC–26 **General SPD EIS and NEPA Process**

DOE is committed to providing the public with comprehensive environmental reviews of its proposed actions in accordance with NEPA and believes it provided numerous opportunities and means for public comment on the program. The SPD Draft EIS analyzed each environmental resource area in a consistent manner across all the alternatives to allow for a fair comparison among the alternatives and among the candidate sites for surplus plutonium disposition facilities. The comment period for the SPD Draft EIS was extended from 45 days to 60 days. During that time, DOE convened five public hearings to obtain oral and written comments from the public. These hearings were open to all individuals and organizations, and their format was intended to encourage public discussion and interaction.

As part of the procurement process, bidders were asked to provide environmental information to support their proposals. This information was analyzed in an Environmental Critique prepared for the DOE source selection board prior to award of the MOX fuel fabrication and irradiation services contract. DOE then prepared an Environmental Synopsis on the basis of the Environmental Critique, which was released to the public as Appendix P of the *Supplement to the SPD Draft EIS* in April 1999. This *Supplement* included a description of the affected environment around the three proposed reactor sites, and analyses of the potential environmental impacts of operating these reactors using MOX fuel (Sections 3.7 and 4.28 of this SPD EIS, respectively). During the 45-day period for public comment on the *Supplement*, DOE held a public hearing in Washington, D.C., on June 15, 1999, and invited comments. Responses to those comments are provided in Volume III, Chapter 4.

WASHDC–27 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's concern that they are being ignored, taken advantage of, and not kept informed. Efforts were made to contact persons living near the selected reactor sites and inform them of the proposed use of MOX fuel. The *Supplement to the SPD Draft EIS* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North

In regard to the public hearing process, DOE has made a good attempt, but not having meetings since the reactors were chosen and not having those meetings in the affected communities are like a slap in the face. DOE has an obligation to hold meetings in the reactor communities and to educate the public as to what is going to be used in the reactors. 28

I am opposed to use of plutonium in Duke reactors. 29

Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. For those interested parties who could not attend the hearing on the *Supplement*, DOE provided various other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Further, interested parties will likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

To stay informed and involved on the progress of the surplus plutonium disposition program, request to be included on the mailing list by visiting the MD Web site at http://www.doe-md.com, or writing to the following address: Office of Fissile Materials Disposition, United States Department of Energy, P.O. Box 23786, Washington, DC 20026-3786. Another source of information is the public reading rooms located at each of the DOE sites.

WASHDC–28 General SPD EIS and NEPA Process

Although DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*, since the inception of the fissile materials disposition program, DOE has supported a vigorous public participation policy, including informing and educating the public. DOE has presented information about the disposition of fissile materials to the public in various forms: public hearing presentations, fact sheets, exhibits, technical reports, visual aids, and a video. Information has been distributed by such mechanisms as mail, email, fax, Web sites, telephone, and press interviews.

WASHDC–29 Reactors

DOE acknowledges the commentor's opposition to using MOX fuel in Duke reactors. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. Section 4.28 was revised to discuss the potential environmental impacts of operating the Duke reactors (Catawba and McGuire) with MOX fuel.

The representative of COGEMA stated that information is sent to those who ask. What is the address? 30

In view of the fact that you have no plans for holding meetings in the Southeast, my organization, the Nuclear Information and Research Service, will submit three videotapes of its hearings. We gave individual members of the public an opportunity to get information and make comments. There is a zero relationship between the tapes and public meetings. 31

Who is the contractor chosen to complete the MOX fuel process? COGEMA has a vested interest in reprocessing technologies worldwide. 32

WASHDC–30 **MOX RFP**

Information on COGEMA's environmental record can be found on their Web site at http://www.cogema.com or by contacting Ms. Christi A. Byerly. Her address is: 7401 Wisconsin Avenue; Bethesda, MD 20814. She may also be contacted by telephone at (301) 941-8367. Her fax number is (301) 652-5690, and her email address is cbyerly@cogema-inc.com.

WASHDC–31 **General SPD EIS and NEPA Process**

Videotapes of hearings hosted by the Nuclear Information and Research Service were not received by DOE.

For those interested parties who could not attend the public hearing on the *Supplement to the SPD Draft EIS*, DOE provided various other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Equal consideration was given to all comments, regardless of how or where they were received. Further, interested parties will likely have the opportunity to submit additional comments during the NRC reactor license amendment process should the MOX approach be pursued per the SPD EIS ROD.

WASHDC–32 **MOX RFP**

The contractor selected by DOE for MOX fuel fabrication and irradiation services, is DCS. They would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. Should the decision be made to proceed with the hybrid approach, COGEMA would lend its expertise within the limits of the contract, which does not have any provisions for reprocessing.

U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing and separation of plutonium from spent nuclear fuel. The use of U.S. surplus plutonium in existing domestic, commercial reactors does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel). The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was

It is appalling that the consortium is relying on the operating experience of European reactors, which use different fuel, and that the safety records of the consortium have not been made available. 33

I understand it has been requested that some of the Federal budget money earmarked for APSF be moved to the SRS canyons project. Will this diversion of money affect the APSF project in the long term? 34

What types of activities or technologies can the United States provide to Russia before the U.S.–Russian agreement is in place in September? 35

produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons.

WASHDC–33 **MOX Approach**

Information gleaned from experience of European reactors is one of many factors taken into consideration in developing the strategy for using the MOX fuel in domestic, commercial reactors. The environmental, safety and health consequences of the MOX approach in the proposed reactors are addressed in Section 4.28. In addition, NRC would evaluate license applications and monitor the operations of both the MOX facility and reactors selected to use MOX fuel, to ensure adequate margins of safety. As discussed in the revised Section 4.28, the most recent performance assessments of the reactors selected to irradiate MOX fuel, completed in the first three months of 1999, were deemed acceptable by NRC. (In 1999, NRC began to perform plant performance reviews instead of the systematic assessments of licensee performance. At that time, NRC changed its rating system from adjectives of acceptable, good or superior, to one of acceptable or unacceptable.)

WASHDC–34 **Other**

The funding of APSF is beyond the scope of this SPD EIS. Since it is uncertain whether APSF will be built, this SPD Final EIS does not take any credit for the presence of APSF and has revised any discussion of APSF to include the phrase "if built" to inform the reader of this uncertainty. This change is discussed in more detail in Chapter 1 of Volume I.

WASHDC–35 **Nonproliferation**

The United States and Russia have been engaged in extensive ongoing cooperative research, small-scale tests, and demonstrations of plutonium disposition technologies under the auspices of the *Agreement on Scientific and Technical Cooperation in the Management of Plutonium.* Technical subjects addressed in these collaborative efforts include conversion of plutonium metal to an oxide form, use of weapons-grade plutonium in MOX fuel in various types of nuclear power reactors, and immobilization of plutonium into forms suitable for geologic disposal.

To date has any technology been transferred from the United States to Russia? There is a May 4, 1999, application on file with NRC, but it does not really say what would be transferred to Russia. Will this technology or information go forward before the agreement is finalized? 36

Is DOE sure that equipment can be exported before the U.S.–Russian agreement is in place? 37

MOX fuel does not meet the goals outlined by the Office of Fissile Materials Disposition. The Russians are really trying to pursue the reprocessing of plutonium, which is contrary to U.S. policy. Our leadership is always confused, and it seems that it may be getting manipulated. The clearest expression of our policy seems to be, "Follow us; we are right behind you." The relationship of our policy and our goals is confusing to Russia. Therefore, I question whether our policy is meeting the goals that the two countries share. 38

WASHDC–36 **Nonproliferation**

Technology that has been transferred to date includes a code package for performing safety analyses on fast reactors, critical experiment data to validate computer safety codes, and data on irradiation of MOX fuel in commercial U.S. reactors. The May 4, 1999, NRC license application is intended to cover equipment for manufacturing fuel. The precise equipment list will be developed once Russia has selected the fuel fabrication methods it intends to use for this mission. Equipment and technology may be transferred to support work covered by the *Agreement on Scientific and Technical Cooperation in the Management of Plutonium* signed in July 1998. All transfers of equipment and technology completed to date were covered by individual licenses submitted on a case-by-case with the appropriate government organization.

WASHDC–37 **Nonproliferation**

Yes, equipment may be transferred to support work covered by the *Agreement on Scientific and Technical Cooperation in the Management of Plutonium* signed in July 1998.

WASHDC–38 **Nonproliferation**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this.

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials.

Why run the security risk of MOX fuel fabrication and use? We have tried to discuss security with NRC with no avail. The United States has so many nuclear weapons that it is easy for people to get their hands on weapons-grade plutonium. The availability of plutonium, however, is not a good excuse for its use in MOX fuel. In fact, the use of MOX fuel will end nonproliferation as we know it. 39

Commercial nuclear power is already highly uneconomical, environmentally damaging, and dangerous. No new reactors have been built since Three Mile Island. Americans want renewable energy, not nuclear power, which produces radioactive waste for which there are no accommodations. Plutonium was made for bombs; using it in commercial reactors is dangerous. 40

WASHDC–39 **Nonproliferation**

DOE acknowledges the commentor's concern for security of MOX fuel. The proposed DOE surplus plutonium disposition facilities are all at locations where plutonium would have the levels of protection and control required by applicable DOE safeguards and security directives and requirements. Safeguards and security programs would be integrated programs of physical protection, information security, nuclear material control and accountability, and personnel assurance. Physical barriers; heavily armed guards; access control systems; detection and alarm systems; procedures, including the two-person rule (which requires at least two people to be present when working with special nuclear materials in the facility); and personnel security measures, including security clearance investigations and access authorization levels, would be used to ensure that special nuclear materials stored and processed are adequately protected. Closed-circuit television, intrusion detection, motion detection, and other automated materials monitoring methods would be employed. Furthermore, the physical protection, safeguards, and security for the MOX facility and domestic, commercial reactors would be in compliance with NRC regulations. International inspections of the proposed facilities would be conducted strictly by procedure so as not to compromise security.

WASHDC–40 **DOE Policy**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry or provide a new energy source. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently

There seems to be an implication in the viewgraphs that there are two options: one, immobilization of all 50 t (55 tons); the other, a combination of immobilization and the irradiation of MOX fuel. Are these in fact the options, and when will there be a decision as to going one way or the other? 41

What is aqueous polishing, and how is it incorporated into the surplus plutonium disposition process? Is there experience in other places with aqueous polishing. 42

Is part of the reprocessing process at La Hague? 43

declared excess to national security needs is never again used for nuclear weapons.

The use of renewable energy sources is beyond the scope of this SPD EIS.

WASHDC–41 **Alternatives**

Section 2.3.1 explains the development of the 15 reasonable alternatives that were analyzed in this SPD EIS. Four of the alternatives (11A, 11B, 12A and 12B) provide the option to immobilize all the surplus plutonium while the other eleven provide facility siting options of the hybrid approach of using both immobilization and MOX fuel fabrication. DOE has identified as its preferred alternative a hybrid approach to disposition up to 50 t (55 tons) of surplus plutonium. Under this approach, approximately 33 t (36 tons) of clean plutonium would be used to fabricate MOX fuel, which would be irradiated in domestic, commercial reactors. The remaining 17 t (19 tons) of low-purity plutonium would be immobilized because it is not suitable for fabrication into MOX fuel due to the complexity, timing, and cost that would be involved in purifying those plutonium materials. Decisions on the surplus plutonium disposition program will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD no sooner than 30 days after publishing the SPD Final EIS.

WASHDC–42 **Plutonium Polishing**

Aqueous polishing as proposed for surplus plutonium disposition is a process that removes gallium and other impurities that can affect the use of the plutonium as reactor fuel from the plutonium dioxide feed for the MOX facility. The process, described in Section 2.4.3.2, would dissolve plutonium dioxide in nitric acid, subject the solution to solvent extraction, then convert the solution back to an oxide powder through precipitation. Similar processes have been used at many DOE facilities including Hanford, LANL, and SRS.

WASHDC–43 **MOX RFP**

La Hague is a reprocessing facility. However, U.S. policy dating back to the Ford Administration has prohibited the commercial, chemical reprocessing

Immobilization is safer, faster, and cheaper. You have agreed to immobilize 17 tons of surplus plutonium, but probably only because it is not suitable for MOX fuel. All of the material could be immobilized, so why not immobilize all of it? Why resort to MOX fuel at all? 44

We find the MOX plan unacceptable, for it poses unreasonable risks to public health and the environment, undermines U.S. nonproliferation goals, and lacks a sound economic strategy. 45

and separation of plutonium from spent nuclear fuel. The U.S. surplus plutonium would be fabricated into MOX fuel at a secure DOE site that is owned by the U.S. Government and would be irradiated in the selected domestic, commercial reactors. This does not involve reprocessing (reprocessing is a chemical separation of uranium, transuranic elements [including plutonium], and fission products from spent reactor fuel and the reuse of the plutonium and uranium to produce new fresh fuel).

WASHDC–44 **Alternatives**

DOE has identified as its preferred alternative the hybrid approach which includes both immobilization and MOX fuel. As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach would be more expensive than the immobilization-only approach. However, pursuing the hybrid approach provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

WASHDC–45 **MOX Approach**

DOE acknowledges the commentor's opposition to the MOX approach to surplus plutonium disposition. DOE has identified as its preferred alternative the hybrid approach.

This SPD EIS identifies and analyzes the potential human health and environmental impacts from the construction and normal operation of the MOX facility, and irradiation of MOX fuel in the Catawba, McGuire, and North Anna reactors. The proposed use of MOX fuel is consistent with the U.S. nonproliferation policy and would ensure that plutonium which was produced for nuclear weapons and subsequently declared excess to national security needs is never again used for nuclear weapons.

The utilities are in this for money, and that money will be furnished by taxpayers. We need to forgo this endeavor and allow for the phaseout and shutdown of nuclear energy operations. Immobilization should be our focus. 46

Is the annual 10 million dollar cap stipulated in the Request for Proposals no longer applicable? 47

A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

WASHDC–46 **MOX Approach**

Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. The MOX facility would produce nuclear fuel that would displace LEU fuel that utilities would have otherwise purchased. If the effective value of the MOX fuel exceeds the cost of the LEU fuel that it displaced, then the contract provides that money would be paid back to the U.S. Government by DCS based on a formula included in the DCS contract. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

WASHDC–47 **MOX RFP**

The $10,000,000 cap is no longer applicable. During negotiations it was clear that fluctuations in the price of LEU that the MOX fuel would replace, a variable that the contractor has no control of, has a significant impact on the economics. In order to ensure an equitable sharing of risk, a revised approach to the maximum Government liability was included in the final negotiated contract. The revised approach includes a consideration of market price of LEU as well as other variable factors affecting the fabrication of MOX fuel

Will there be disclosure to the taxpayers of how much utilities will be compensated, over and above their costs, for participation in this program? 48

Who is liable for environmental damage during the transportation and irradiation of MOX fuel? 49

Is the plutonium still Government material after it is converted to MOX fuel? 50

I am concerned about the dimensional stability of MOX fuel. If the fuel shrinks slightly, there is a loss of heat transfer between the fuel and the cladding, which can lead to fuel melting. If there is expansion, resulting pressure on the cladding can cause a rupture. It is my understanding that COGEMA has more experience with these processes. What is the consortium's track record? 51

such as throughput and escalation. The final methodology to determine the maximum cost to the Government for any given year is to be submitted by the contractor for DOE approval prior to commencement of fabricating MOX fuel.

WASHDC–48 **MOX RFP**

The utilities would be compensated for all costs in excess of the cost associated with the use of LEU which are directly attributable to MOX fuel. These costs include, for example, increased NRC oversight costs; modification costs required for the proposed reactors to use MOX fuel; and increased costs for additional LEU enrichment. In addition, the utilities would receive the MOX fuel at a discounted price when compared to the price of the LEU fuel that the MOX fuel replaces. The exact amount of the discount is set in the contract. It is between 10 and 50 percent.

WASHDC–49 **DOE Policy**

The reactor licensee is responsible for the MOX fuel once it is received at the reactor site. The transportation of special nuclear materials, including fresh MOX fuel is the responsibility of DOE's Transportation Safeguards Division. The transportation of the MOX spent fuel to the potential geologic repository for disposal would also be the responsibility of DOE.

WASHDC–50 **DOE Policy**

DOE would own the MOX facility and MOX fuel until the fuel was received at the reactor site. At that point, the fuel would become the responsibility of the reactor licensee.

WASHDC–51 **MOX RFP**

FRAGEMA's (a subsidiary of COGEMA and FRAMATOME) experience with fabricating MOX fuel indicates a leakage rate of less than one-tenth of 1 percent. FRAGEMA has provided 1,253 MOX fuel assemblies, with more than 300,000 fuel rods for commercial reactor use. There have been no failures (including fuel melts or ruptures) and leaks have occurred in only 3 assemblies (a total of 4 rods). All leaks occurred as a result of debris in the reactor coolant system and occurred in 1997 or earlier. The French requirements for

I am curious about your position on differences between MOX spent fuel and the low-level radioactive waste that is generated in the normal operation of the reactor, and about your estimation of the amounts of plutonium that would be released under recycle or clearance level rulemaking in which NRC is currently involved. I am defining "recycle" in terms of materials that can be converted into consumer products. 52

In performance of the health evaluations, what is the biological effectiveness rating used for alpha emitters? 53

According to the *Supplement*, the MOX fuel assemblies would only be irradiated for two cycles, whereas uranium is now irradiated for three 18-month cycles. What is the basis for making that change to operating procedures? Will accommodations for that change have any impact on existing fuel management? What is the highest rod burnup on discharge of the second-cycle fuel assemblies? What is the highest burnup for the second cycle that we can expect? Do you have any plans for transition to three cycles for MOX fuel in the course of the program? 54

debris removal were changed in 1997 to alleviate these concerns. Since that time, there have been no leaks in MOX fuel rods.

WASHDC–52 **Waste Management**

There are differences in fission product inventories and activation products between an LEU and MOX core during a fuel cycle. However, the only way significant quantities of fission products could end up in LLW would be in the event of a large–scale fuel leak. As discussed in the previous response, there have been no failures and very few leaks in FRAGEMA's experience. The use of MOX fuel would not be expected to result in any additional LLW from refuelings because the reactors would continue to operate on the same schedule as if they were using only LEU fuel. Eventual D&D of the reactors, which may include recycling of metals, would be performed by the utilities in accordance with NRC regulations in force at that time. However, it is premature to assume that scrap metal at the reactors would be recycled as part of D&D and end up in consumer products.

WASHDC–53 **Human Health Risk**

The latest published version of 10 CFR 20.1004 (January 1, 1999) states that the quality factor for alpha particles is 20, and this factor was used in the analysis performed for this SPD EIS. This regulatory criteria (10 CFR 20) is established by NRC, and is therefore the official benchmark from which U.S. nuclear utilities are continually governed in the realm of radiation protection.

WASHDC–54 **MOX Approach**

The fuel management plan that would be used with the MOX assemblies does not reflect a change in operating procedures, other than the fact that some of the assemblies would be MOX rather than LEU. The DCS team utility companies currently use a typical 18-month fuel cycle, replacing approximately 40 percent of the fuel assemblies in a reactor at each refueling. Some assemblies are used for two cycles, some for three cycles. The utilities plan to maintain the current fuel management schemes and would use the MOX fuel assemblies for only two cycles. There are currently no plans to transition to three cycles for the MOX assemblies.

The EIS indicates that 0.25 mg of plutonium will be released annually into water and air at the fabrication facility. This seems like a very large amount. How much would be released into the air or water annually near the reactor communities? Will those numbers be written out somewhere? I want to know the numbers. My definition of significant might not be the same as yours. 55

I recently wrote a report criticizing the analysis of design basis accidents for reactors using MOX fuel. My criticism focused on the treatment of the emissions of plutonium and other alpha-emitting actinides in beyond-design-basis accidents at reactors, and the impacts of those emissions in terms of additional latent cancer fatalities. It is noteworthy that the *Supplement* reflects recalculations that are much closer to my figures. There are, however, some outstanding questions relative to those calculations. For example, it is not clear for how long into the future the dose is calculated. What are the assumptions? Will there be evacuation or cleanup? It is impossible for someone to make an independent check without knowing all of the parameters and assumptions. I hope that these will be provided in the SPD Final EIS. The document is still inadequate with regard to the discussion of potential differences in the consequences of accidents and the risks of severe accidents associated with the use of MOX fuel. There is still no discussion of very germane, unresolved fuel performance issues associated with the current generation of MOX fuel that have been noted in Europe; increased fission gas generation, increased fuel temperature, and the Cabri reactor test go unmentioned in the document. There is also no concrete discussion of the severe accident risks of the reactors that have been chosen. In particular, four of the six reactors have special ice condenser containments that are not representative of the fleet of U.S. pressurized water reactors, and NRC has outstanding concerns about their performance. 56

MOX fuel burnup is proposed at a maximum burnup of 45 GWD/t with peak pin burnup at 50 GWD/t. Actual MOX fuel burnup limits would be established in concert with the NRC following a thorough safety review. It should be noted that reactors in Belgium and Germany typically use MOX fuel to burnups between 45 and 50 GWD/t and that while current French burnup limits are lower than that, French burnup limits for LEU fuel are also lower than those for U.S. reactors.

WASHDC–55 **Human Health Risk**

From a scientific standpoint, an annual release of 0.25 mg of plutonium is a very small quantity. There would be no expected releases of plutonium isotopes from the proposed reactors occurring from normal operating conditions. Doses to an MEI at each of the plants are also expected to be small—i.e., McGuire, 0.31 mrem; Catawba, 0.73 mrem; and North Anna, 0.37 mrem. All of these doses fall within stringent NRC 10 CFR 20 and 10 CFR 50 regulatory requirements.

WASHDC–56 **Facility Accidents**

The accident results in Section 4.28 have been revised to incorporate computer code corrections. The accident calculation is included in the Administrative Record for this SPD EIS. The calculation contains all of the input parameters including the MACCS2 computer files.

The particular "control rod ejection" scenario is a bounding postulated accident. None has ever occurred at a nuclear power plant. The Cabri RIA test program was designed to challenge typical fuel rods under conditions that are more extreme than conditions that would be experienced during a real pressurized water reactor control rod ejection. Out of the nine Cabri tests (six with uranium fuel, three with MOX fuel), two uranium fuel rods and one MOX fuel rod experienced failures. The MOX failure occurred at an energy deposition rate that is greater than can realistically be reached by high burnup fuel, even after an extremely unlikely worst case control rod ejection. These data, both for LEU and MOX fuel, will be used in ongoing fuel design studies.

While it is understood that there are differences from the use of MOX fuel versus LEU fuel, these differences are not expected to decrease the safety of

I have heard nothing about what will be done with the additional waste from this process. 57

the reactors. All of the factors discussed by the commentor were evaluated by the proposed reactor licensees to ensure that the reactors, including those with ice condensers, can continue to operate safely using MOX fuel and will continue to be evaluated. Before any MOX fuel is used in the United States, NRC would have to perform a comprehensive safety review that would include information prepared by the reactor plant operators as part of their license amendment applications.

WASHDC–57 **Waste Management**

As described in Section 4.28.2.2, the volume of waste generated is not expected to increase as a result of the reactors using MOX fuel. The wastes would continue to be handled in the same manner as they are today with no change required due to the use of MOX fuel at the reactors.

As described in Sections 2.18.3 and 4.28.2.8, additional spent fuel would be produced by using MOX fuel instead of LEU fuel in domestic, commercial reactors. Spent fuel management at the proposed reactor sites is not expected to change dramatically due to the substitution of MOX assemblies for some of the LEU assemblies. Likewise, the additional spent fuel would be a very small fraction of the total that would be managed at the potential geologic repository.

This SPD EIS assumes, for the purposes of analysis, that Yucca Mountain, Nevada, would be the final disposal site for all immobilized plutonium and MOX spent fuel. As directed by the U.S. Congress through the NWPA, as amended, Yucca Mountain is the only candidate site currently being characterized as a potential geologic repository for HLW and spent fuel. DOE has prepared a separate EIS, *Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* (DOE/EIS-0250D, July 1999), which analyzes the environmental impacts from construction, operation and monitoring, related transportation, and eventual closure of a potential geologic repository.

My principal concerns go to the well-known toxicity of plutonium. The only solution to the management of the radioactive waste generated by the production and use of plutonium in the weapons program would be isolation for the full hazardous life of the materials. It appears that the hazardous life is now far longer than we had previously understood. Recent research findings with respect to alpha emitters and alpha-related damage at the cellular and subcellular level indicate far greater risks of cancer and other health impacts than are currently considered in the setting of radiation protection standards. (Those standards are currently based on either the lifetime risk of fatal cancer or gross genetic defects in the first couple of generations.) We have been learning more in recent years about the impacts of low-dose irradiation, particularly as it may be received repeatedly over a period of time. The most recent studies show that DNA may be affected by exposures in the cytoplasm rather than the nucleus of a cell. There may also be a delayed mutational effect at the cellular level. This means that we may have underestimated the impacts of alpha emitters. At the Second International Symposium on Ionizing Radiation (held in Canada), a statement was made that rather than the range of biological effectiveness that was previously used, 2- to 20-fold, it may be necessary for us to consider a quality factor of 2,000 or more with respect to alpha emitters. Moreover, all of the international regulators attending that conference concurred that it is necessary to set protective standards for each distinctive component of the environment for its own sake. NRC was not represented at the conference. 58

Where are the transport corridors and what communities would be affected? Where are the results of that analysis? 59

WASHDC–58 **Human Health Risk**

DOE acknowledges the commentor's concern of the toxicity of plutonium and its effects on human health. The latest published version of 10 CFR 20.1004 (January 1, 1999) states that the quality factor for alpha particles is 20, not 2000. This regulatory criteria (10 CFR 20) is published in coordination with NRC, and is the official benchmark from which U.S. nuclear utilities are continually governed in the realm of radiation protection.

WASHDC–59 **Transportation**

The transportation of special nuclear materials is the subject of detailed planning with DOE's Transportation Safeguards Division. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in Appendix L. The results of transportation analyses are presented in the transportation sections in Chapter 4 of Volume I. Additional details are provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

I am glad DOE will be using safe, secure transport. However, the communities the vehicles are to pass through will not know about the materials being transported. Can you tell me where it says in the law or regulations that these individuals do not have a right to this information? 60

Transportation has not been given enough emphasis. 61

There has not been adequate inclusion of the areas through which this material would be transported. Any terrorist who wants to find out where the material is can simply track the shipments. 62

WASHDC–60 **Transportation**

The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in Appendix L. DOE Safeguard and Security Orders govern the handling and transport of fissile materials and can be found on the DOE Web site at http://www.explorer.doe.gov.

WASHDC–61 **Transportation**

DOE acknowledges the commentor's concern that the transportation issue has not been given enough emphasis. The transportation requirements for the surplus plutonium disposition program are evaluated in this SPD EIS. Potential environmental impacts of transportation are presented in the transportation sections in Chapter 4 of Volume I and in more detail in Appendix L. The transportation of special nuclear materials is the subject of detailed planning with DOE's Transportation Safeguards Division. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in Appendix L. Additional details are also provided in *Fissile Materials Disposition Program SST/SGT Transportation Estimation* (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

WASHDC–62 **Transportation**

DOE has considered the inherent risks, including terrorist concerns, associated with transporting plutonium materials. While DOE prefers to minimize the transportation of plutonium that is still desirable for weapons use, plutonium is routinely and safely transported in the United States every day. As described in Appendix L.3.3, transportation of nuclear materials would be performed in accordance with all applicable DOT and NRC transportation requirements. Interstate highways would be used, and population centers avoided, to the extent possible. All shipments of surplus plutonium that have not been converted to a proliferation-resistant form would be made by DOE's SST/SGT system, as described in Appendix L.3.2.

Response WASHDC–59 provides additional information related to transportation concerns.

All of the communities on the transportation route are affected communities. I would like to call your attention to a DOE-commissioned study by Dr. Jenkin Smith at the University of New Mexico. This study very thoroughly documents public concerns with the transport of any type of nuclear materials. The public is discerning as to whether it wants to take a risk, and as to the causes and goals of the risk. Nevertheless, there are those in the community who have more to say before a decision is made—some of them in support of immobilization at SRS. I believe, furthermore, that there are those out there in the general public who can distinguish one goal from another. They are aware, for example, that the transportation of plutonium would be more complicated—i.e., involve more steps—for the MOX fuel option than for immobilization. Because all persons in the transportation areas would be affected, all should be included in this information exchange on the issue of transportation. 63

The people of Southeast know little of this program and have no access to the relevant information. How many DOE persons are available to come down to the reactor communities and attend meetings like this one? 64

WASHDC–63 **Transportation**

Transportation would be required for both the immobilization and MOX approaches to surplus plutonium disposition. Transportation of special nuclear materials, including fresh MOX fuel, would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material.

DOE acknowledges the commentor's concern that all persons along the transportation routes be included in the information exchange. Since the inception of the fissile materials disposition program, DOE has supported a vigorous public participation policy. It has conducted public hearings in excess of the minimum required by NEPA regulations to engender a high level of public dialogue on the program. The office has also provided the public with substantial information in the form of fact sheets, reports, exhibits, visual aids, and videos related to fissile materials disposition issues. It hosts frequent workshops, and senior staff members make presentations to local and national civic and social organizations on request. Additionally, various means of communication—mail, a toll-free telephone and fax line, and a Web site (http://www.doe-md.com)—have been provided to facilitate the public dialogue. It is DOE policy to encourage public input into these matters of national and international importance.

WASHDC–64 **General SPD EIS and NEPA Process**

Efforts were made to contact persons living near the selected reactor sites and inform them of the proposed use of MOX fuel. The *Supplement to the SPD Draft EIS* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. For those interested parties who could not attend the meeting on the *Supplement,* DOE

I am glad to hear that additional meetings are going to be considered. We have been told of the 80 meetings that you as an office have held. We would like to get a list of those meetings showing when and where they were held, how they were announced, and what topics were discussed. Laura Holgate did not stay to hear the earlier comments or questions, and she is not here this afternoon. How serious can this be taken if the Director does not stay? 65

provided various other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. After careful consideration of its public involvement opportunities, including the availability of information and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement*. DOE felt there were sufficient other means provided for the public to express their concerns and provide comments as discussed above. Further, interested parties will likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

Since the inception of the fissile materials disposition program, DOE has supported a vigorous public participation policy, including informing and educating the public. DOE has presented information about the disposition of fissile materials to the public in various forms: public hearing presentations, fact sheets, exhibits, technical reports, visual aids, and a video. Information has been distributed by such mechanisms as mail, email, fax, Web sites, telephone, and press interviews. To learn more about the surplus plutonium disposition program or request to be included on the mailing list, visit the MD Web site at http://www.doe-md.com, or write to the following address: Office of Fissile Materials Disposition, United States Department of Energy, P.O. Box 23786, Washington, DC 20026-3786. Information on the program is also available in the public reading rooms located at each of the DOE sites.

WASHDC–65 **General SPD EIS and NEPA Process**

Although DOE decided not to hold additional meetings on the *Supplement to the SPD Draft EIS*, other means have been provided for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Further, interested parties will likely have the opportunity to submit additional comments during the NRC reactor license amendment process should the MOX approach be pursued per the SPD EIS ROD.

Laura Holgate regrets she was not able to attend the entire hearing but she was required to meet with the State Department in preparation for her trip to Russia. Dave Nulton, the program manager since the inception of MD in 1994, is well versed in the surplus plutonium disposition program and has acted on the behalf of Ms. Holgate on many occasions. DOE is entrusted with implementing the U.S. nonproliferation policy and takes that responsibility very seriously.

The following is the list of meetings and hearings detailing the dates and location, by topic, of previous public meetings and hearings held by DOE that addressed the fissile materials disposition program. These meetings and hearings were advertised to the public through newspaper advertisements, special mailings, or public service announcements. Scoping meetings and hearings on draft NEPA documents included two complete sessions for each date given (usually one in the afternoon and one in the evening; and in Washington, D.C., one in the morning and one in the afternoon).

DOE PUBLIC MEETINGS AND HEARINGS RELATING TO THE STORAGE AND DISPOSITION OF WEAPONS-USABLE FISSILE MATERIALS PROGRAM

Pre-Scoping Meetings for *Storage and Disposition of Weapons-Usable Fissile Materials PEIS*

Date	Location
4/21/94	Washington, DC[1]
5/4/94	Arlington, VA[1]
5/5/94	Arlington, VA[1]
8/5/94	Washington, DC (Public Interest Groups)
9/30/94	Washington, DC (Industry Groups)

[1] DOE provided travel and living expenses for representatives from various organizations to attend this meeting (nongovernmental organizations; tribal representatives; Citizens Advisory Board members, etc.).

Scoping Meetings for *Storage and Disposition of Weapons-Usable Fissile Materials PEIS*

Date	Location
8/17/94	North Augusta, SC
8/24/94	Chicago, IL
8/24/94	Denver, CO
8/31/94	Richland, WA
9/7/94	Amarillo, TX
9/14/94	Boston, MA
9/14/94	Las Vegas, NV
9/21/94	Idaho Falls, ID
9/28/94	Oak Ridge, TN
9/28/94	Livermore, CA
10/5/94	Los Alamos, NM
10/12/94	Washington, DC

Remove HEU from Scope of *Storage and Disposition of Weapons-Usable Fissile Materials PEIS*

Date	Location
11/10/94	Oak Ridge, TN

Review Hearings for *Disposition of Surplus Highly Enriched Uranium Draft EIS*

Date	Location
11/14/95	Knoxville, TN
11/16/95	Augusta, GA

Plutonium Disposition Option Meeting

Date	Location
12/13/94	Washington, DC

Review Hearings for *Storage and Disposition of Weapons-Usable Fissile Materials Draft PEIS*

Date	Location
3/26/96	Denver, CO
3/28/96	Las Vegas, NV
3/29/96	Las Vegas, NV
4/2/96	Oak Ridge, TN
4/11/96	Richland, WA
4/15/96	Idaho Falls, ID
4/18/96	Washington, DC
4/22/96	Amarillo, TX
4/23/96	Amarillo, TX
4/ 30/96	North Augusta, SC

Date	Location
7/23/96	Austin, TX
7/25/96	Palo Alto, CA
7/29/96	Chicago, IL
7/31/96	Boston, MA
8/1/96	Washington, DC

Proposed Nonproliferation Assessment Outline
Review of *Draft Nonproliferation Assessment*

Date	Location
10/28/96	Oakland, CA
10/28/96	Las Vegas, NV
10/28/96	Idaho Falls, ID
10/30/96	Richland, WA
10/30/96	Portland, OR
11/1/96	Washington, DC
11/4/96	Amarillo, TX
11/6/96	North Augusta, SC
11/6/96	Oak Ridge, TN
11/8/96	Denver, CO

Scoping Meetings for *Surplus Plutonium Disposition EIS*

Date	Location
6/10/97	Idaho Falls, ID
6/12/97	Amarillo, TX
6/19/97	North Augusta, SC
7/1/97	Richland, WA

MOX Procurement Meetings

Date	Location
8/28/97	Chicago, IL
12/11/97	Chicago, IL
5/20/98	Atlanta, GA
5/21/98	Atlanta, GA

Immobilization Conference

Date	Location
5/12/98	Washington, DC

Review Hearings for *Surplus Plutonium Disposition Draft EIS*

Date	Location
8/4/98	Richland, WA
8/11/98	Amarillo, TX
8/13/98	North Augusta, SC
8/18/98	Portland, OR
8/20/98	Idaho Falls, ID

Review Hearing for *Supplement to the Surplus Plutonium Disposition Draft EIS*

Date	Location
6/15/99	Washington, DC

National Dialogue Meetings

Date	Location
7/23–24/96	Chicago, IL
11/18–19/96	Washington, DC
9/6/97	Knoxville, TN
9/9–10/97	Boise, ID
10/20/97	Portland, OR
10/21/97	Richland, WA
10/22/97	Spokane, WA
10/23/97	Seattle, WA
6/22–23/98	San Diego, CA
6/25–26/98	Chicago, IL

DOE Citizens Advisory Boards[2]

Date	Location
2/24/98	Amarillo, TX
6/27/98	Aiken, SC

FISSLE MATERIALS DISPOSITION PROGRAM PARTICIPATION IN PUBLIC MEETINGS SPONSORED BY OTHER ORGANIZATIONS

National Tribal Plutonium Forum

Date	Location
4/30/96	Seattle, WA

Public Meeting Sponsored by South Carolina State Senator Leventis

Date	Location
6/24/99	Columbia, SC

Military Production Network/Alliance for Nuclear Accountability

Date	Location
5/96	Washington, DC (DC Days)
5/94	Washington, DC (DC Days)
1/22/98	Washington, DC
5/98	Washington, DC (DC Days)

[2] MD briefed DOE Citizens Advisory Board meetings upon request. More briefings were provided than those listed.

Is the Brockett report available, and how would I get a copy of it? This report goes back a couple of decades. 66

I have a concern about COGEMA. In the United States we can ask for information under the Freedom of Information Act and typically get answers from the appropriate agency—NRC, for example. With COGEMA, however, we don't have this opportunity. COGEMA has extensive experience with MOX fuel in its country. Will we have full access to its information on MOX fuel use? How would I go about getting this? 67

What kind of access do we have to COGEMA's experimental database on the use of MOX fuel? 68

What was the reason for announcing the Chicago Operations Office address. What information will we receive from that office? I don't think it will be the contract itself. How will we know the quantitative outcome of the new negotiations, which will include replacement of the only compensation rate that the public is aware of? 69

Will speakers be able to review their comments before they are submitted for publication in the SPD Final EIS? 70

Speakers Bureau Presentations Given by DOE Personnel

Date	Location
3/25/99	Oklahoma City (Conference of Southern County Associations)
7/19/99	Kansas City (Conference of Southern Legislators)

WASHDC–66 **General SPD EIS and NEPA Process**

DOE was unable to identify the requested report.

WASHDC–67 **MOX RFP**

Information on COGEMA's environmental record can be found on their Web site at http://www.cogema.com or by contacting Ms. Christi A. Byerly. Her address is: 7401 Wisconsin Avenue; Bethesda, MD 20814. She may also be contacted by telephone at (301) 941-8367. Her fax number is (301) 652-5690, and her email address is cbyerly@cogema-inc.com.

WASHDC–68 **MOX RFP**

See response WASHDC–67 for contact information at COGEMA.

WASHDC–69 **General SPD EIS and NEPA Process**

Copies of the redacted contract for MOX fuel fabrication and irradiation services is available from the Chicago Operations Office and were handed out at the June 15, 1999 hearing. Additional copies can be requested by contacting Mr. Robert Selby at (603) 252-2067 or by email, Robert.Selby@ch.doe.gov. This will provide all information on the contractual arrangement between DCS and DOE.

WASHDC–70 **General SPD EIS and NEPA Process**

Notetakers captured the main points of issues or concerns raised by the commentors; therefore, the comments presented here are not a verbatim transcript of the hearing. In the interest of finalizing this SPD EIS it would not be practical to have each speaker review their comments prior to publishing

The Blue Ridge Environmental Defense League opposes the use of plutonium fuel in commercial reactors for the reasons stated in the written comment by Lou Zeller, and for other reasons as well. The planned use of MOX fuel establishes a dangerous precedent in the nuclear industry by needlessly exposing people to the risks of plutonium. DOE will be engaging in a crapshoot if it moves forward with the MOX fuel plan. 71

The public must bear in mind that NRC is proposing to eliminate or curtail adjudicative license proceedings, the only opportunity we have as citizens for access to the judicial system. 72

I resent having to drive—in my case from North Carolina—to a meeting with persons outside the affected area. When the Chicago Operations Office handled a meeting in the Southeast, it was a real formal meeting with a real transcript. Those who held the meeting were patient people who did not pretend that they were in charge; it was a public meeting, and we were in charge. The move to an interactive meeting, even though it may seem to be more polite, diminishes the public's role. In this format the public is not listened to. There must be a more open process and better access to information. Several people are working today and cannot come to the meeting. My democratic rights are threatened due to fact that all relevant information—i.e., proprietary and other corporate information—has not been provided. 73

the Comment Response Document. DOE and the notetakers have made every effort to ensure the essence of each participant's comment(s) has been presented in a clear, concise, and accurate manner. Written comments were accepted at the hearing and have been submitted via fax, mail, or Web site. Equal consideration was given to all comments, regardless of how or where they were received.

WASHDC–71 **MOX Approach**

DOE acknowledges the commentor's opposition to the use of MOX fuel in commercial reactors. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

This SPD EIS identifies and analyzes the potential human health and environmental impacts from the construction and normal operation of the MOX facility. Section 4.28 was revised to discuss the potential environmental impacts of operating Catawba, McGuire, and North Anna, the reactors that would use the MOX fuel.

WASHDC–72 **DOE Policy**

NRC requirements for adjudicative license proceedings are beyond the scope of this SPD EIS.

WASHDC–73 **General SPD EIS and NEPA Process**

DOE acknowledges the commentor's concern that the hearing format does not allow the public to be listened to and that the process should be more open, with easier access to information. Since the inception of the fissile materials disposition program, DOE has supported a vigorous public participation policy. It has conducted public hearings in excess of the minimum required by NEPA regulations to engender a high level of public dialogue on the program. The office has also provided the public with substantial information in the form of fact sheets, reports, exhibits, visual aids, and videos related to fissile materials disposition issues. Efforts were made to contact persons living near the selected reactor sites and inform them of the proposed use of MOX fuel. The *Supplement to the SPD Draft EIS* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. Additionally, various means of communication—mail, a toll-free telephone and fax line, and a Web site (http://www.doe-md.com)—have been provided to facilitate the public dialogue. It is DOE policy to encourage public input into these matters of national and international importance.

Based on the feedback from participants in previous public hearings, DOE used an interactive hearing format. This format facilitates open discussions and better understanding of the proposed actions associated with surplus plutonium disposition. It also provides an opportunity for the participants to meet one another, exchange information, and share concerns. Notetakers captured the main points of issues or concerns raised; these comments, along with the written comments submitted and the phone messages recorded during the public comment periods, were analyzed and responded to. Equal consideration was given to all comments, regardless of how or where they were received.

DOE has also placed copies of data reports and documents used in the preparation of this SPD EIS in DOE reading rooms. DOE is not permitted to disseminate proprietary or classified information, although as much information as possible (e.g., redacted copies of the contract with DCS) has been made available to the public. To learn more about the surplus plutonium

I have a videotape of testimony by people from the reactor community, but have been denied permission to play this tape at the meeting today. I was told there was no opportunity. These people are not being heard. In my view, sane-looking people are making an insane proposal. The Southeast will not be victimized any further by the Federal Government. 74

The proposed reactors have been operated very safely. In fact, nuclear reactors are inherently an environmentally safe source of energy. The only truth told by the antinuclear advocates today is that nuclear power is expensive. That is due to construction costs. Nuclear power does have a role to play. I can't understand why persons have these concerns when the citizens of Lake Anna do not seem to have a problem. 75

Public meetings should be held in the Southeast, and the comment period should be extended to accommodate those meetings. 76

disposition program; DCS, the team selected to fabricate the MOX fuel and irradiate it; request to be included on the mailing list; or to contact the program office, visit the MD Web site at http://www.doe-md.com. Written requests for information on the program can be addressed to: Office of Fissile Materials Disposition, United States Department of Energy, P.O. Box 23786, Washington, DC 20026-3786.

WASHDC–74 General SPD EIS and NEPA Process

In the interest of stimulating discussions and providing opportunities for the participants to speak, it was not possible to show the proceedings of other public hearings contained on the videotape. The comments from the videotape and their responses are addressed in the responses identified as DCR005A and DCR005B presented in the State of North Carolina in Volume III, Chapter 4.

WASHDC–75 MOX Approach

DOE acknowledges the commentor's belief that nuclear power reactors are a source of safe energy and have a role to play in the disposition of surplus plutonium. Based on the analyses of the potential environmental impacts presented in the revised Section 4.28, DOE believes using MOX fuel in domestic, commercial reactors is an effective way to accomplish the goal of the program. The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Because the reactors selected to use MOX fuel already exist, the expense to build new reactors is avoided.

WASHDC–76 General SPD EIS and NEPA Process

DOE acknowledges the commentor's request for additional public hearings in the Southeast and extension of the comment period. After careful consideration of its public involvement opportunities, including information availability and mechanisms to submit comments, DOE decided not to hold additional hearings on the *Supplement to the SPD Draft EIS*. However, interested parties will likely have the opportunity to submit additional comments during the NRC reactor license amendment process should the MOX approach be selected. In addition to the public hearing on the

What is the role of Nuclear Fuel Services in Irwin, Tennessee, on the contractor team? 77

On page 1 of the *Supplement*, it is stated that no construction would begin until the Record of Decision for the *Surplus Plutonium Disposition Environmental Impact Statement* was issued. When you look at the Federal budget request, however, you can see that in 1999 there were appropriations for construction in the amount of 48 million, and 28 million of that was for a MOX fuel fabrication facility. This looks like design, not construction. Will this be changed in the next budget request? It is getting a little confusing. 78

There are problems in fabricating test fuel at the Los Alamos National Laboratory (LANL). A report indicates that to date 14 batches of MOX fuel test pellets have failed to meet technical specifications or have experienced other problems. I would encourage DOE to address this in the SPD Final EIS. I was thinking that it would be helpful to know if this could affect the time line in a general or specific way. 79

Supplement held in Washington, D.C., DOE provided various other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Although it did not extend the comment period, DOE did consider all comments received after the close of that period. All comments were given equal consideration and responded to.

WASHDC–77 **MOX RFP**

Nuclear Fuel Services will lend support in the area of safeguards and security based on its experience as a NRC fuel fabrication plant licensee.

WASHDC–78 **DOE Policy**

The money included in the fiscal year 1999 budget request was for the MOX facility design. The terminology used in preparing the budget has been set by the U.S. Congress and Office of Management and Budget. DOE does not have the ability to change this terminology.

WASHDC–79 **MOX Approach**

Fuel fabrication R&D at LANL was sponsored in order to fabricate test fuel for irradiation in the Advanced Test Reactor at INEEL. Fuel for the first irradiation test was fabricated successfully. The second irradiation test was canceled based on technical input from DCS, the team that was selected to fabricate MOX fuel and irradiate it. Fuel R&D continues at LANL because further development is useful to DOE in the event that a lead assembly fabrication facility is needed and for other programmatic purposes, especially related to characterizing the feed powder from the pit conversion facility.

The difficulties encountered with fabrication of MOX test fuel at LANL are due neither to the lack of MOX fuel fabrication capability at LANL nor to generic technical difficulties associated with weapons-grade plutonium. These difficulties are primarily due to switching the uranium oxide used in the MOX test fuel. LANL had successfully fabricated MOX test fuel for the first irradiation test using an uranium oxide commercially supplied by CAMECO. To begin fabrication of the MOX test fuel for the second irradiation test, an uranium oxide from the ammonium uranyl carbonate process was used.

There are some issues I am uneasy about. We (the United States) have a 50-year history of attempting to separate the military and commercial uses of nuclear power, but this MOX approach far more effectively combines the two than anything in the past. It also does not incorporate any means of disposal. The State of Pennsylvania has had a little experience with an experimental reactor that features a partial plutonium core. Over the period during and immediately after its operation, a level of leukemia six times higher than expected was seen in the nearby community. However, these findings were dismissed as insignificant. The people in the environs of the facility are concerned both about the materials remaining in the area and about the impact of releases prior to facility shutdown. 80

Although LANL is involved in this process, along with Pantex, the citizens in the area have been fighting the Waste Isolation Pilot Project (WIPP). WIPP is now open, probably illegally, but that is how you people do business. We don't want any more waste shipped throughout the country, and we particularly don't want to see more waste coming to WIPP or LANL, making it more of a "bomb plant." DOE has made promises of a cleanup but has only been creating more waste. There is no reason to make this MOX fuel. No one wants nuclear power anymore; the nuclear power plants now operating are old and are not being replaced. There is no reason for the Government to get involved in providing fuel to a dead industry that is going to kill us all. 81

WASHDC–80 **DOE Policy**

Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing. After irradiation, the MOX fuel would be removed from the reactor and managed with the rest of the spent fuel from the reactor, eventually being disposed of at a potential geologic repository built in accordance with the NWPA.

Under normal operating conditions, it is not expected that the makeup of the discharges will change significantly from those associated with non-MOX (LEU) fuel. Electricité de France reactors in France have seen little or no impact from the use of MOX fuel on radionuclide releases in effluents. The use of MOX fuel in U.S. reactors is analyzed in Section 4.28. No LCFs would be expected from normal operations.

Furthermore, annual doses to an MEI at each of the plants are estimated to be small—i.e., McGuire, 0.31 mrem; Catawba, 0.73 mrem; and North Anna, 0.37 mrem. All of these doses fall within stringent NRC 10 CFR 20 and 10 CFR 50 regulatory requirements and are much lower than radiation annually received from natural background sources.

WASHDC–81 **MOX Approach**

The goal of the surplus plutonium disposition program is to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner. Converting the surplus plutonium into MOX fuel and using it in domestic, commercial reactors is an effective way to accomplish this. The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program.

This is the first time DOE has gone through NRC in regulating DOE facilities. DOE is paying for the licensing processes. Are you also paying for licensing of the tritium process? 82

The operation of WIPP has been subject to NEPA review, EPA certification, and legal challenge. NEPA documentation for the operation of WIPP was completed in 1997 with the publication of the *WIPP Disposal Phase Final Supplemental EIS* (DOE/EIS-0026-S-2, September 1997) and ROD. The operation of WIPP received EPA certification in May 1998. Despite continued legal challenges, Judge John Garrett's March 22, 1999, ruling paved the way for WIPP to receive its' first waste shipment on March 26, 1999.

Transportation would be required for both the immobilization and MOX approaches to surplus plutonium disposition. Transportation of special nuclear materials, including fresh MOX fuel, would use DOE's SST/SGT system. Since the establishment of the DOE Transportation Safeguards Division in 1975, the SST/SGT system has transported DOE-owned cargo over more than 151 million km (94 million mi) with no accidents causing a fatality or release of radioactive material. The transportation requirements for the surplus plutonium disposition program are also evaluated in this SPD EIS.

Response WASHDC–80 provides additional information on doses at each of the proposed reactors.

WASHDC–82 **NRC Licensing**

The use of TVA commercial reactors to produce tritium for DOE is addressed in the *Final EIS for the Production of Tritium in a Commercial Light Water Reactor* (DOE/EIS-0288, March 1999). DOE anticipates reaching an agreement concerning license amendment costs associated with this proposal.

STATEMENT OF NON-GOVERNMENTAL ORGANIZATIONS ON PLUTONIUM DISPOSITION

June 15, 1999
FINAL VERSION

The nuclear arms race has left the United States and Russia with large plutonium stockpiles. Both countries have had terrible experience with plutonium processing and its attendant wastes. Contamination of areas such as Hanford, Savannah River, and Rocky Flats in the United States, and Chelyabinsk, Tomsk, and Krasnoyarsk in Russia demonstrates the hazards of plutonium processing, and the poor environmental and safety culture of the US Department of Energy (DOE) and the Russian Ministry of Atomic Energy (Minatom).

With the end of the Cold War, we have the opportunity to redirect resources from nuclear weapons programs into cleaning up the legacy of nuclear weapons development, and to other needed programs. Under the pressure of people of both countries, the governments of the US and Russia have between them declared 100 metric tons of plutonium (roughly one-third of the total) to be "surplus" to military needs. We recognize the need for this plutonium to be stored as safely as possible, and to be converted into non-weapons-usable forms.

However, we are deeply disturbed by the primary method by which this conversion is planned. We are convinced that using surplus weapons plutonium in fuel for nuclear reactors (known as mixed-oxide or MOX fuel) is not an acceptable solution. A better method of disposition would be to immobilize the plutonium -- that is, to mix it with ceramic or glass and to provide a radioactive barrier to further prevent theft and diversion. 1

We are very concerned about the safety risks of using MOX fuel in existing reactors, almost none of which are designed to run on plutonium fuel. According to a study released by the Nuclear Control Institute in January, the use of a one-third core of warhead plutonium fuel in U.S. nuclear reactors could result in up to a 37% increase in cancer risk to the public in the event of a severe accident. Concerns are even greater in Russia. Many of the Russian reactors slated for MOX use are old and will reach the end of their 30-year licensed lifetimes before the disposition program is complete. Furthermore, Russian regulatory agencies do not have sufficient resources or political standing to adequately ensure safety at a MOX fabrication facility and at reactors. 2

Furthermore, we are dismayed that the people of both countries have been cut out of the process as decisions about plutonium disposition are made. The US has not ensured that Russian programs funded with American money follow environmental and public participation requirements. Joint US-Russian documents are largely unavailable to the Russian public, and the Russian translation of a 1996 joint study was marked "for official use only." Within the US itself, the DOE has made a mockery of the public participation process by issuing a contract for production and irradiation of MOX fuel before issuing a final Environmental Impact Statement and Record of Decision on the subject. It has also failed to include the input of communities living near reactors that are proposed for MOX fuel irradiation. Much of the European reprocessing and MOX performance record, cited by 3

DCR008

DCR008–1 **MOX Approach**

DOE acknowledges the commentors' concern regarding the use of weapons-grade plutonium in MOX fuel and irradiating it in commercial reactors. DOE has identified as its preferred alternative the hybrid approach. Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

The commercial reactors selected for the MOX approach include only those reactors whose operational life is expected to last beyond the life of the surplus plutonium disposition program. Furthermore, although no U.S. commercial reactors are licensed to use plutonium-based fuel, several are designed to use MOX fuel, and others can easily and safely accommodate a partial MOX core.

The environmental, safety and health consequences of the MOX approach at the proposed reactors are addressed in Section 4.28. This section analyzes several reactor accidents, including both design basis and beyond-design-basis accidents. For MOX fuel, as compared to LEU fuel, there is an increase in risk, about 3 percent, for the large-break loss-of-coolant accident (the bounding design basis accident). The largest increase in risk for beyond-design-basis accidents is approximately 14 percent for an interfacing systems loss-of-coolant accident at North Anna. Both of these accidents have an extremely low probability of occurrence. In the unlikely event this beyond-design-basis accident were to occur, the expected number of LCFs would increase from 2,980 to 3,390 with a partial MOX core and prompt fatalities would increase from 54 to 60. At North Anna, the likelihood of a large-break loss-of-coolant accident occurring is 1 chance in 48 thousand per year and the likelihood of an interfacing systems loss-of-coolant accident occurring is 1 chance in 4.2 million per year.

NRC would evaluate license applications and monitor the operations of both the MOX facility and domestic, commercial reactors selected to use MOX fuel, to ensure adequate margins of safety.

DCR008–2 **Nonproliferation**

DOE acknowledges the commentor's concerns regarding the safe disposition of surplus Russian plutonium as MOX fuel, although programmatic and policy issues such as U.S. policies toward plutonium disposition in Russia are beyond the scope of this SPD EIS. The scope of this SPD EIS is focused on analysis of alternatives on whether and how much U.S. surplus plutonium should be used as MOX fuel, which technology should be used for immobilization, where to construct the proposed surplus plutonium disposition facilities that are needed, and where to perform lead assembly fabrication and testing.

DCR008–3 **General SPD EIS and NEPA Process**

The public outreach programs available to the people of Russia concerned with plutonium disposition are beyond the scope of this SPD EIS. Since the inception of the U.S. fissile materials disposition program, DOE has supported a vigorous public participation policy. It has conducted public hearings in excess of the minimum required by NEPA regulations to engender a high level of public dialogue on the program. The office has also provided the public with substantial information in the form of fact sheets, reports, exhibits, visual aids, and videos related to fissile materials disposition issues. It hosts frequent workshops, and senior staff members make presentations to local and national civic and social organizations on request. Additionally, various means of communication—mail, a toll-free telephone and fax line, and a Web site (http://www.doe-md.com)—have been provided to facilitate the public dialogue.

Efforts were made to contact persons living near the selected reactor sites and inform them of the proposed use of MOX fuel. The *Supplement to the SPD Draft EIS* was mailed to those stakeholders who requested it as well as to those specified in the DOE *Communications Plan* (i.e., Congressional representatives, State and local officials and agencies, and public interest groups around the United States) and the utilities' contact lists. The utilities, Duke Power Company and Virginia Power Company, would operate the proposed reactors (located in North Carolina, South Carolina, and Virginia) should the MOX approach be pursued per the SPD EIS ROD. For those interested parties who could not attend the public hearing on the *Supplement* held in Washington, D.C., DOE provided various other means for the public to express their concerns and provide comments: mail, a toll-free telephone and fax line, and the MD Web site. Further, interested parties would likely have the opportunity to submit additional comments during the NRC reactor license amendment process.

DOE conducted a procurement process in accordance with DOE NEPA regulations 10 CFR 1021.216. The selected team, DCS, would design, request a license, construct, operate, and deactivate the MOX facility as well as irradiate the MOX fuel in domestic, commercial reactors. However, these activities are subject to the completion of the NEPA process. As stipulated in DOE's phased contract with DCS, until and depending on the decisions regarding facility siting and approach to surplus plutonium disposition are made and announced in the SPD EIS ROD, no substantive design work or construction can be started by DCS on the MOX facility. Should DOE decide to pursue the No Action Alternative or the immobilization-only approach, the contract with DCS would end. The contract is phased so that only nonsite-specific base contract studies and plans can be completed before the ROD is issued, and options that would allow construction and other work would be exercised by DOE if, and only if, the decision is made to pursue the MOX approach. DOE is not permitted to disseminate proprietary or secret information, although as much information as possible (e.g., redacted copies of the contract with DCS) has been made available to the public. To learn more about the surplus plutonium disposition program or DCS, the team selected to fabricate the MOX fuel and irradiate it; request to be included on the mailing list; or to contact the program office, visit the MD Web site at http://www.doe-md.com. Written requests for information on the program can be addressed to: Office of Fissile Materials Disposition, United States Department of Energy, P.O. Box 23786, Washington, DC 20026-3786.

STATEMENT OF NON-GOVERNMENTAL ORGANIZATIONS ON PLUTONIUM DISPOSITION
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DOE as proof that MOX is a sound technology, is secret, further hindering public participation. 3

We hear a number of contradictory things from the US and Russian governments about the rationale behind a MOX program. DOE representatives say that the United States must support MOX programs in both countries because Russia insists upon it. Meanwhile, Minatom has said that it would prefer not to undertake a large-scale MOX program at the current time, and will do so only with heavy funding from abroad. 4

Minatom officials claim that plutonium is a valuable energy resource. Yet by their own estimates, plutonium-based nuclear energy will be more expensive than uranium-based nuclear energy for at least several decades. US officials say that MOX is not being pursued for its energy value but rather that it has been chosen to facilitate quick disposition of plutonium in Russia. However, immobilization is likely to be a much faster and cheaper method of plutonium disposition than MOX. 5

Finally, we are told that the MOX program is a non-proliferation measure. But under pressure from nuclear establishments in both countries, the goal of stabilization and immobilization of plutonium has been undermined by a program which threatens to push both countries into a plutonium economy. Money makes policy. The larger the investment into plutonium facilities under the auspices of a disposition program, the more likely it is that these facilities will continue to be used for other purposes once the disposition program is completed. Furthermore, it is apparent that international plutonium companies such as Cogema (France) and British Nuclear Fuels, Ltd. are seeking to serve their own financial interests by pushing MOX.

Fresh MOX fuel in commerce presents a proliferation threat as the plutonium in it can be removed and used for weapons purposes. A 1997 DOE non-proliferation assessment of plutonium disposition found "that fresh MOX fuel remains a material in the most sensitive safeguards category, because plutonium suitable for use in weapons could be separated from it relatively quickly and easily." 4

It is clear to us that rather than solving the problem of placing plutonium into safe and secure forms, a MOX program is likely to promote further plutonium processing and use, something that is undesirable on environmental, safety, economic, and non-proliferation grounds.

Therefore, we call on the US and Russian governments to stop MOX disposition programs in both countries. Instead, emphasis should be placed on safe storage and development of immobilization programs.

Plutonium disposition programs must include significant and meaningful public input, including access to all information, including costs and operating records of the various actors involved in a disposition program. The public in the communities most directly affected should have ample opportunity for meaningful input into the decision-making process. All US funding of Russian programs should be contingent on compliance with the appropriate environmental and public process laws. 3

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DCR008–4 **Nonproliferation**

The *Joint Statement of Principles* signed by Presidents Clinton and Yeltsin in September 1998 provide general guidance for achieving the objectives of a future bilateral agreement to disposition surplus plutonium in the United States and Russia. Sensitive negotiations between the two countries have indicated that the Russian government accepts the technology of immobilization for low-concentration, plutonium-bearing materials, but that the MOX approach would be considered for higher-purity feed materials.

Understanding the economic dilemma in Russia, the U.S. Congress has appropriated funding for a series of small-scale tests and demonstrations of plutonium disposition technologies jointly conducted by the United States and Russia. In fiscal year 1999 (starting October 1998), Congress further appropriated funding to assist Russia in design and construction of a plutonium conversion facility and a MOX fuel fabrication facility. This funding would not be expended until the presidents of both countries signed a new agreement. Although the amount appropriated by Congress is not sufficient to fund the entire Russian surplus plutonium disposition program, the United States is working with Russia and other nations to resolve this issue.

DOE agrees that plutonium oxide and fresh MOX fuel are proliferation concerns and would only ship these materials in SST/SGTs as discussed in Appendix L. To avoid proliferation concerns at the proposed plutonium disposition facilities, they would be built to meet DOE and/or NRC's highest security standards, guarded by heavily armed security forces, and surrounded by state-of-the-art security equipment. However, DOE does not agree that MOX presents a larger proliferation concern than immobilized plutonium. A nonproliferation assessment was completed by DOE on the various alternatives for disposing of surplus plutonium. This assessment, *Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Excess Plutonium Disposition Alternatives* (DOE/NN–0007, January 1997), concluded that "Each of the options for disposition of excess weapons plutonium that meets the Spent Fuel Standard would, if implemented appropriately, offer major nonproliferation and arms reduction benefits. . ."

Signatories to the Statement of Non-Governmental Organizations on Plutonium Disposition
June 15, 1999

Australia

Daniel Voronoff
Friends of the Earth, Australia

Grant Harper
Perth, Western Australia

Canada

Leslie Bruce
Blue/Green Society
Sackville, New Brunswick

Kristen Ostling
Campaign for Nuclear Phaseout
Ottawa, Ontario

Kathleen Cooper
Canadian Environmental Law Association
Toronto, Ontario

Phillip Penna
Canadian Uranium Alliance
North Bay, Ontario

Anne Adelson
Canadian Voice of Women for Peace

Jacques Boucher
Centre de ressources sur la non-violence
Montréal, Quebec

Dave Taylor
Concerned Citizens of Manitoba
Manitoba

Marco Morency
Down to Earth
Moncton, New Brunswick

Matthew Jonah
Friends of the Christmas Mountains
Sackville, New Brunswick

Michael Murphy
InterChurch Uranium Committee Educational Cooperative
Saskatoon

Cecilie Davidson
International Year of the Tiger Foundation
Victoria, British Columbia

Anne Williams
Lethbridge Network for Peace
Lethbridge, Alberta

Dr. Michael Wallace
Nanoose Conversion Project
Vancouver, British Columbia

Murray Rogers
Rogers' Environmental and Educational Foundation
Nanaimo, British Columbia

Norman Abbey
Society Promoting Environmental Conservation
Vancouver, British Columbia

Mark Connell
Sussex Society for the Public Interest
Sussex, New Brunswick

Jamie Simpson
Conservation Council of New Brunswick
Fredericton, New Brunswick

Beatriz Oliver
Montreal, Quebec

Rosalie Bertell, PhD, GNSH
Toronto, Ontario

France

Ms Solange Fernex
Womens International League for Peace and Freedom - France
Biederthal

Germany

Bernd Damisch
Working Circle Indians Today
Indigenous Peoples Rights Group
Reichenbach

Georgia

Manana Kochladze
Friends of the Earth - Georgia / Georgia Greens Movement
Tbilisi

Hungary

Krisztian Lugosi
Budapest

Japan

Hideyuki Ban
Citizens' Nuclear Information Center
Tokyo

Kazakhstan

Kaisha Atahanova
Eco-center
Karaganda

Kirill Osipov
Eco-dober - Ekibastuz
Ekibastuz

Eldar Gabbasov
Eco-dober - Karaganda
Karaganda

Sergey Kuratov
Zelenoe spasenie
Almaty

Netherlands

Daniel Swartz
The ZHABA Collective
Amsterdam

Pakistan

Asif Leghari
Awami Committee for Development
South Punjab

Russia

Milya Kabirova
Aigul
Chelyabinsk

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Use of MOX fuel in domestic, commercial reactors is not proposed in order to subsidize the commercial nuclear power industry. Rather, the purpose of this proposed action is to safely and securely disposition surplus plutonium by meeting the Spent Fuel Standard. The Spent Fuel Standard, as identified by NAS and modified by DOE, is to make the surplus weapons-usable plutonium as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors. Consistent with the U.S. policy of discouraging the civilian use of plutonium, a MOX facility would be built and operated subject to the following strict conditions: construction would take place at a secure DOE site, it would be owned by the U.S. Government, operations would be limited exclusively to the disposition of surplus plutonium, and the MOX facility would be shut down at the completion of the surplus plutonium disposition program. For reactor irradiation, the NRC license would authorize only the participating reactors to use MOX fuel fabricated from surplus plutonium, and the irradiation would be a once-through cycle with no reprocessing.

DCR008–5 **Alternatives**

DOE has identified as its preferred alternative the hybrid approach as discussed in response DCR008–1. As shown in the cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), it is expected that the hybrid approach would be more expensive than the immobilization-only approach.

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Signatories to the Statement of Non-Governmental Organizations on Plutonium Disposition
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Russia (cont.)

Vladimir Sliviak
Anti-Nuclear Campaign, Socio-Ecological Union (SEU)
Moscow

Natalya Baskova
Assistance
Chelyabinsk

Olga Pitsunova
Association "Counterpart for Development"
Saratov

Viktor Tereshkin
Association for environmental journalists
Sankt-Petersburgh

Anatoly Morozov
Association of the estate owners
Chelyabinsk

Olga Belskaya
Baikal Environmental Wave
Irkutsk

Michael Vitman
Center for Assistance to Civic Initiatives
Saratov

Andrew Pinchuk
Center for Assistance to Environmental Initiatives - Saratov

Mikhail Piskunov
Center for Assistance to Environmental Initiatives - Dimitrovgrad/Ulyanovsk

Svetlana Fominyh
Center for public groups
Chelyabinsk

Alexey Yablokov
Center for Russian Environmental Policy
Moscow

German Lukashin
Chernobyl Union
Snezhinsk/Chelyabinsk

Olga Sivachenko
Child Environmental Association "Green Circle"
Saratov

Agniya Tikhonova
Cleen Air
Chelyabinsk

Michael Bantukov
Club "Ecology and Communa"
Saratov

Yury Fominyh
Dobrolyubie charity
Chelyabinsk

Ashat Kayumov
Dront/Socio-Ecological Union
Nizhny Novgorod

Alexandra Koroleva
ECODEFENSE!
Kaliningrad

Nikolay Schur
Ecologia Foundation
Chelyabinsk

Galina Pashnina
Ecological Nabat muzeum
Muslyumovo/Chelyabinsk

Vladislav Korobkin
Edinstvo v zakon
Chelyabinsk

Vladimir Mikheev
Environmental Movement
Krasnoyarsk

Elena Goncharenko
Foundation for support of non-profit groups
Chelyabinsk

Anna Shvedova
Green Arrow
Voronezh

Vladimir Lagutov
Green Don
Novocherkassk

Gleb Nimushin
"Green Fond"
Saratov

Eugeny Usov
Greenpeace
Moscow

Oleg Bodrov
Green World
Sosnovy Bor

Mila Bogdan
ISAR
Moscow

Gennady Smirnov
Kaira-club
Anadyr (Chukotka)

Anastasia Bardaninova
Kashtaksky Bor
Chelyabinsk

Zoya Adamova
Lipy
Chelyabinsk

Natalia Mironova
Movement for Nuclear Safety
Chelyabinsk

Alexey Leschev
No to Corporations
Voronezh

Lyubov Knyazeva
Ozerchanki
Ozyorsk/Chelyabinsk

Tatyana Schur
Shag na vstrechu
Snezhinsk/Chelyabinsk

Lydia Popova
Socio-Ecological Union (SEU) Center for Nuclear Ecology and Energy Policy
Moscow

Eugeny Krysanov
Nuclear and radiation safety program of SEU
Moscow

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Signatories to the Statement of Non-Governmental Organizations on Plutonium Disposition June 15, 1999

Russia (cont.)

Lyubov Luneva
Independent environmental programmes center of SEU
Moscow

Nikolay Zubov
Socio-Ecological Union - Krasnoyarsk

Abdrahim Galimov
Taufik
Chelyabinsk

Gosman Kabirov
Techa
Chelyabinsk

Boris Nekrasov
Tomsk' environmental inspection
Tomsk

Vladimir Desyatov
Union for Chemical safety
Komsomolsk-na-Amure

Alexandr Veselov
Union of ecologists
Ufa, Bashkortostan

Nikolay Kraev
VNII Zhitkova
Kirov

Ivan Kovalyov
Volga environmental information agency
Nizhny Novgorod

Galina Ragouzina
WISE Russia
Kaliningrad

Segey Kolesnik
Yabloko
Chelyabinsk

Tatyana Borovkina
Zhenschiny ZATO
Snezhinsk/Chelyabinsk

Alexey Mityunin (participated in nuclear testing program in Semipalatinsk)
Miass/Chelyabinsk

Slovakia

Igor Polakovic
Sirius - ZO SZOPK
Bratislava

Switzerland

Prof. Dr. Michel Fernex
Physician for Social Responsibility/International Physicians for the Prevention of Nuclear War - Switzerland
Rodersdorf

Turkmenistan

Andrey Aranbaev
CATENA
Dashovuz

Farid Tuhbatullin
Dashovuz environmental club
Tashauz

Ukraine

Alla Shevchuk
Odessa Socio-Ecological Union
Odessa

Eugeny Romanenko
Spilka molodi podolu
Kiev

United Kingdom

Nigel Chamberlain
Cumbria & North Lancashire Peace Groups
Glovers Cottage, Lazonby
Penrith, Cumbria

Martin Forwood
Cumbrians Opposed to a Radioactive Environment
Cumbria

Dr Rachel Western
Friends of the Earth
London

Martin Hemingway
Nuclear Free Local Authorities UK
Manchester

United States

Adele Kushner
Action for a Clean Environment
Alto, Georgia

Susan Gordon
Alliance for Nuclear Accountability
Seattle, Washington

Ann Harris
Alliance for Public Health & Safety
Ten Mile, Tennessee

Barbara Hickernell
Alliance to Close Indian Point
Ossining, New York

Janet Marsh Zeller
Blue Ridge Environmental Defense League
Glendale Springs, North Carolina

Rita Kilpatrick
Campaign for a Prosperous Georgia
Atlanta, Georgia

Ethan Brown
Carolina Peace Resource Center
Columbia, South Carolina

Vivek Ananthan
Center for Creative Activities & Volunteers for International Solidarity
Philadelphia, Pennsylvania

Chuck Johnson
Center for Energy Research
Salem, Oregon

L.J. Glicenstein
Central Pennsylvania Citizens for Survival
State College, Pennsylvania

Gabriela Bulisova
Chernobyl Children's Project
Kalamazoo, Michigan

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Signatories to the Statement of Non-Governmental Organizations on Plutonium Disposition
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United States (cont.)

Chris Williams
Citizens Action Coalition of Indiana
Indianapolis, Indiana

Deb Katz
Citizens Awareness Network
Shelburne Falls, Massachusetts

Harvey Wasserman
Citizens Protecting Ohio
Bexley, Ohio

Norm Cohen
Coalition for Peace and Justice
Cape May New Jersey

Michael J. Keegan
Coalition for a Nuclear Free Great Lakes, Citizen's Resistance at Fermi Two, and Don't Waste Michigan
Monroe, Michigan

Cyndy deBruler
Columbia River United
Hood River,Oregon

Daniel Hirsch
Committee to Bridge the Gap
Los Angeles, California

Lloyd Marbet
Don't Waste Oregon
Portland, Oregon

Ms. B.J. Medley
Earth Concerns of Oklahoma
Tulsa, Oklahoma

Paul Kawika Martin
EarthCulture
Washington, DC

Chris Trepal
Earth Day Coalition
Cleveland, Ohio

Judith Johnsrud
Environmental Coalition on Nuclear Power
State College, Pennsylvania

Steve Jambeck & Joan Flynn
EnviroVideo
Ft. Tilden, New York

Bob Darby, Tom Ferguson
Food Not Bombs
Atlanta, Georgia

Barbara Wiedner
Grandmothers for Peace International
Elk Grove, California

Damon Moglen
Greenpeace
Washington, DC

Starlene Rankin, Lionel Trepanier, and Marc Loveless
Greens / Green Party USA
Lawrence, Massachusetts

David Ellison
Green Party of Ohio
Cleveland, Ohio

Paige Knight
Hanford Watch
Portland, Oregon

Arjun Makhijani
Institute for Energy and Environmental Research
Takoma Park, Maryland

Robin Mills
Maryland Safe Energy Coalition
Baltimore, Maryland

Mary Lampert
Massachusetts Citizens For Safe Energy
Boston, Massachusetts, and St. Duxbury, Massachusetts

NC-WARN
Durham, NC

Judy Treichel
Nevada Nuclear Waste Task Force
Las Vegas, Nevada

George Crocker
North American Water Office
Lake Elmo, Minnesota

Paul L. Leventhal
Nuclear Control Institute
Washington, DC

Bill Smirnow
Nuclear Free New York
Huntington, New York

Michael Mariotte
Nuclear Information and Resource Service
Washington, DC

Jack & Felice Cohen-Joppa
The Nuclear Resister
Tucson, Arizona

Michael Carrigan
Oregon PeaceWorks
Salem, Oregon

Gordon S. Clark
Peace Action
Washington, DC

Carol Jahnkow
Peace Resource Center of San Diego
San Diego, California

Judi Friedman, Chairperson
People's Action for Clean Energy, Inc.
Canton, Connecticut

Robert K. Musil, PhD
Physicians for Social Responsibility
Washington, DC

Ed Arnold
Physicians for Social Responsibility Atlanta
Atlanta, Georgia

Barbara Warren, MD,MPH
Physicians for Social Responsibility Colorado
Denver, Colorado

Robert M. Gould, MD
Greater SF-Bay Area Chapter
Physicians for Social Responsibility
San Francisco, California

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Signatories to the Statement of Non-Governmental Organizations on Plutonium Disposition June 15, 1999

United States (cont.)

Evan Kanter, MD, PhD
Washington Physicians for Social Responsibility
Seattle, Washington

Bruce Drew
Prairie Island Coalition
Minneapolis, Minnesota

Ellen Thomas
Proposition One Committee
Washington, DC

Linda Gunter
Safe Energy Communication Council
Washington, DC

Don Moniak
Serious Texans Against Nuclear Dumping
Amarillo, Texas

Amanda Bahnson
Student Environmental Action Coalition
Philadelphia, Pennsylvania

Scott Portzline
Three Mile Island Alert
Pennsylvania

Marylia Kelley
Tri-Valley CAREs (Communities Against a Radioactive Environment)
Livermore, California

Greg Wingard
Waste Action Project
Seattle, Washington

Ann Harris
We The People, Inc.
Ten Mile, Tennessee

Susan Shaer
Women's Action for New Directions
Arlington, Massachusetts

Joan King
Atlanta Women's Action for New Directions
Atlanta, Georgia

Evelyn Mauss and Joan Flynn
Women's International League for Peace & Freedom of Rockaway, New York

Kevin Kamps
World Tree Peace Center
Kalamazoo, Michigan

Merav Datan
Cambridge, Massachusetts

Kev Hall
Dunedin, Florida

Molly Tan Hayden, M.D.
Ann Arbor, Michigan

Ira Helfand, MD
Co-founder and Past President, Physicians for Social Responsibility
Leeds, Massachusetts

John J. Metz
Highland Hts., Kentucky

Nick Stanton
Great Barrington, Massachusetts

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Appendix A
Transcript of Public Meeting
on Mixed-Oxide Fuel

A.1 TRANSCRIPT OF PUBLIC MEETING ON MIXED-OXIDE FUEL HELD IN COLUMBIA, SOUTH CAROLINA ON JUNE 24, 1999

PUBLIC MEETING ON MIXED-OXIDE FUEL

CONDENSED

DATE: Thursday, June 24th, 1999

TIME: 6:38 p.m.

LOCATION: Gressette Building
Columbia, SC

REPORTED BY: LISA D. JETER
Court Reporter

COMPUSCRIPTS, INC.
A Full-Service Court-Reporting Agency
Post Office Box 7172
Columbia, SC 29202

MEMBERS ON PANEL:

SENATOR PHIL P. LEVENTIS
SENATOR JOHN COURSON
MR. ETHAN BROWN
MS. ABBY WOODWARD
MR. DAVID NULTON
MR. BERT STEVENSON
MR. CHARLIE ANDERSON
DR. ARJUN MAKHIJANI
MS. MARY OLSON
MR. ROBERT C. SELBY
MR. DENIS HUGELMAN
MR. R.H. IHDE
MR. STEVE NESBIT

SENATOR LEVENTIS: Good evening. I'm Phil Leventis, and I have convened this meeting to meet several purposes.

I want to expand the record and create a record, an additional record, on the MOX proposal that the Department of Energy has initiated for the Savannah River Site.

I want to offer the Department of Energy and contractors an opportunity to make statements they may want to make. And they have also agreed to answer questions, which is the primary purpose for all of our being here.

Then as time permits, I would like to permit you to ask questions, as well. But from the number of people who have indicated they are interested in asking questions, I hope we can accommodate as many as possible. I don't know how many that will be.

We have a variety of folks with us this evening, and I appreciate everyone's being here.

Let me, before I recognize anyone, tell you that we're going to conduct a relatively informal meeting. However, if you would like to speak, be recognized, please come

to the podium, and state your name clearly for the recorder.

Our recorder this evening is Ms. Lisa Jeter, and she will be recording the proceedings, and we also have a tape recording of the proceedings.

The scenario I would like to follow is, I would like to recognize first those folks who are here from the Department of Energy, from Cogema, from Westinghouse, and also from Duke, and several others who are here whom I would like to acknowledge. Then I'm going to turn the meeting over to Mr. Nulton for some comments from DOE.

Because of the technical nature of the issues that I would like to deal with, I would like for the folks who are speaking to be able to complete their presentations before we start asking any questions.

I have a series of questions that I would like to ask before we open it up to the public, so if you have questions, please write them down.

I've already recognized Ms. Jeter, who is our recorder. I'd like to recognize

several members of the legislature that are here. I've mentioned myself; Senator John Courson, from Columbia; Representative Bill Clyburn. He's sitting in the back with some folks from his district, which is near the facility.

I'd also like to recognize Ms. Abigail Woodward, who has joined us this evening. She is representing Representative Nan Orrock, who is a member from Georgia, representing the downtown Atlanta area. Due to a traffic jam, I guess she wasn't able to be here.

MS. WOODWARD: Actually, she's in Washington right now.

SENATOR LEVENTIS: That's just a little joke because of the quality of life in South Carolina versus the quality of life in Georgia. We appreciate your being here and your interest.

I'd like to recognize those that I understand are here from DOE, and Dave, if there are others, please point them out.

First, Mr. Bert Stevenson; Dave Nulton, who I talked about; Mr. Bob Sel

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also from Duke is Mr. Steve Nesbit; and from Duke, Cogema, Stone and Webster, Mr. Bob Ihde. And also joining us from Europe -- and I hope I pronounce your name correctly -- Mr. Dennis Hugelman with Melox.

We also have from the Institute for Energy and Environmental Research, Dr. Arjun Makhijani, who has joined us, in addition to some other folks from that organization.

Is there anyone else here whom I should have recognized that I didn't? Ethan is with us also. We appreciate your being here.

Anyone else? Oh, I'm sorry. Mary Olson with Nuclear Information and Resource Council from Washington.

Anyone else? Mr. Hank Stallworth is with the Governor's office now dealing with environmental issues and is just here to listen.

Okay. All of those preliminaries have been taken care of. Let me turn the meeting over to Dave Nulton to make what comments you'd like and to recognize those people from DOE.

MR. NULTON: Thank you, Senator.

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I'll be brief, so that we can get into the main part of the meeting and try to address the issues that you have raised.

We came prepared tonight with representatives of the Duke, Cogema, Stone and Webster team, that has been selected by the government for the mixed-oxide fuel fabrication and irradiation services program.

SENATOR COURSON: Excuse me. It may be helpful on the microphone if --

SENATOR LEVENTIS: He's got his own.

SENATOR COURSON: I'm sorry about that.

SENATOR LEVENTIS: I'm sorry.

MR. NULTON: I'll get closer to the microphone.

We've tried to bring with us representatives of the MOX fuel team that can respond to questions that were raised by Senator Leventis in a June 8th letter that he sent to the Department of Energy.

Very briefly, the Department in January of 1997 chose a hybrid approach for the disposition of surplus weapons plutonium that would come out of weapons here in the United

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States.

That hybrid approach has two technical approaches: One is to immobilize a portion of the surplus plutonium in a ceramic form, and then embed that ceramic form into high-level waste containers that are being produced at the Savannah River Site. And the second approach is to use some of the plutonium in mixed-oxide fuel to be burned in commercial reactors.

We conducted a procurement last year and awarded the contract in the spring of this year to the Duke, Cogema, Stone and Webster team, which we will refer to tonight as DCS.

They will design and construct and operate a facility to fabricate mixed-oxide fuel. And then on their team are utilities, Virginia Power and Duke Power, that will provide reactors that will burn that mixed-oxide fuel, and we'll say more about those reactors later.

We have ongoing a negotiation with Russia. This is the result of a number of discussions and agreements that were reached between Vice-President Gore and Prime Minister

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Kiriyenko, and also between Presidents Clinton and Yeltsin in a number of meetings that occurred over the past two to three years.

In September of 1998, there was a summit meeting at which Presidents Clinton and Yeltsin charged their officials in their countries to develop a bilateral agreement between Russia and the United States to dispose of surplus plutonium from weapons.

That negotiation is ongoing, and our goal is to have a bilateral agreement in place at the end of this year -- actually, at the end of this fiscal year.

So by the end of September, our goal is to have a bilateral agreement in place that will address a number of things: The amount of material to be dispositioned in each country, the means by which it will be dispositioned.

That agreement will also address a number of transparency arrangements, that is to show how each country will assure that the other country is indeed getting rid of their material in a way that they have identified in this agreement, so that is ongoing.

We are also in the process of

completing an Environmental Impact Statement and analysis that is the second of two that we've done on this subject.

The first was a programmatic Environmental Impact Statement that was completed in December of 1996. And this -- the more recent document that we are preparing now identifies or evaluates specific sites where these disposition activities will be conducted, the amount of material that would go to either immobilization or mixed-oxide fuel, and then, of course, the impacts of the various technologies to be used for that purpose.

At this point in time, the Department has identified Savannah River as the preferred site for the construction of three facilities: One for immobilization of a portion of the surplus weapons plutonium; one for converting the weapons pits into an oxide material that can be used to feed these other facilities that will be used for disposition; and the third would be a facility to fabricate mixed-oxide fuel, which would then go to the reactors that I mentioned earlier for disposition.

There were a number of questions raised about the contract that the Department has entered into with the Duke Cogema team with regard to cost and fuel offsets and things of that nature. We're prepared to respond to those questions tonight.

Also, there were a number of questions raised about Cogema and their record in Europe at the La Hague plant and the Melox plant. I believe we can answer most of those questions tonight. We also have representatives from Duke Power to answer questions on reactors.

I think, with those brief comments, we should move forward.

SENATOR LEVENTIS: Thank you very much. What I'd like to do is go through a series of questions that I have put together, and I have provided those for folks for DOE, from DCS.

I did not talk with anyone from Duke. But if you would like to, Mr. Nesbit, we've got some questions we'd like to ask, as well. I know you did not necessarily come prepared, but if you would like, we'd like to

ask you some questions.

So I'll go through a series of these questions and then also may have some additional information that we'd like to bring up.

I discussed the issues with the gentlemen from DOE and the other places before we started, and since the purpose of the meeting is to create a record, if they have anything they would like to bring up or add that they feel would help our understanding or help in creating a record, then I invited them to do that. So let me start with the series of questions.

First of all, how long would the immobilization of all 50 tons take if that were the effort?

MR. NULTON: We are developing the capability to immobilize or convert to MOX fuel all 50 tons either -- you know, using a combination of both or immobilizing all, in a period of 10 to 15 years, and that's also the time frame -- 10 years, I believe, is the time frame being addressed in the bilateral agreement with Russia.

SENATOR LEVENTIS: And that's from the point of startup?

MR. NULTON: The point of startup, that's correct.

SENATOR LEVENTIS: That really addresses the second question. You're saying that either immobilizing all of it or using the combination should take 10 to 15 years from the startup?

MR. NULTON: That's correct.

SENATOR LEVENTIS: How long do you think it will take, from your best information, for Russia to complete the use of their 50 tons of plutonium in their reactors?

MR. NULTON: The time frame being addressed in the agreement is 10 years.

SENATOR LEVENTIS: And that's from the time they start up?

MR. NULTON: Yes. Correct.

SENATOR LEVENTIS: Do you have any ideas at this time when they're projected to start up?

MR. NULTON: Well, the schedule that we're working on right now, as we get the facilities up and operating, is in the 2006 time frame.

SENATOR LEVENTIS: And that is about the schedule that you all have projected. Are there any changes in that projection for our startup?

MR. NULTON: Not at this point. That is our schedule right now.

SENATOR LEVENTIS: Is it true that the Department is beginning to design these facilities that you've described even before testing is complete on these projects?

MR. NULTON: There is preliminary design work going on right now. In the case of mixed-oxide fuel, there is no development work to be done.

The MOX fuel process that is being proposed for use and that will be used is essentially the same as the one that's being used in France. It's a process that's been used for a number of years successfully. The fuel has been used successfully in French reactors, so there is no development work to be done there.

SENATOR LEVENTIS: Excuse me. Is that weapons-grade fuel that's reprocessed?

MR. NULTON: It is not weapons-grade fuel, but we're prepared to talk about the differences in those two, if you'd like to do that.

SENATOR LEVENTIS: Well, go ahead and finish. I'm sorry I interrupted you.

MR. NULTON: Okay. In the case of immobilization -- well, let me go to pit conversion. The pit conversion process involves taking a weapons pit, separating it into two hemispherical pieces, and then converting that hemisphere into an oxide form, plutonium oxide.

We currently have a demonstration line, a full-scale demonstration line, operating at the Los Alamos National Laboratory, so that is proceeding.

There's really two purposes of that facility: One is to demonstrate the process, most of the pieces of which have been demonstrated in the past, but what we've done is integrated it into a single line, and that work is ongoing.

The second purpose of that is to process several of the different types of pits

that were produced during the Cold War to show that we can handle these different kinds of pits, so that activity is ongoing.

In the case of immobilization, we're in the final stages of demonstrating the technical process that's going to be used for immobilization.

SENATOR LEVENTIS: Is it absolutely necessary to go through the conversion of the weapons pits to go to immobilization?

MR. NULTON: Yes. They have to be converted to a feed form that can be used for that immobilization process.

SENATOR LEVENTIS: I know that the plan is to use that conversion of the weapons pits for both immobilization and for preparation to fabricate the MOX.

Is that the only process that could be used for immobilization, for preparation for immobilization, or are there other processes available?

MR. NULTON: We have to convert it to a feed form. Now, we probably don't necessarily need to do it with a pit conversion facility. There are chemical processes that

can be used, but they also would require new facilities. So we would propose to use the pit conversion facilities if we were allowed to do that.

SENATOR LEVENTIS: Are they similar in cost when you're talking about the other alternatives for immobilization, beginning the immobilization process?

MR. NULTON: We, in our analysis, concluded that the quickest and least expensive way to build is with the pit conversion facility, yes.

Considering the other activities that are planned for the facilities that are already in existence at Savannah River, the commitments made to shut those facilities down in a certain time frame, the fact that we would have to make modifications to those facilities, we felt that pit conversion facility was -- designing was the way to go, yes.

SENATOR LEVENTIS: Isn't it true that with several programs, including the ITP, that unfortunately has just failed, that the Department has authorized design, even construction, before testing was complete?

MR. NULTON: Charlie, can you answer that?

MR. ANDERSON: Just a little bit on the intank precipitation, ITP, that you talked about. There actually was testing that was conducted for ITP. It was conducted in a lab and in a demonstration prototype scale form.

The difficulty with ITP has been taking that technology and putting it into a production mode inside a high-level waste tank. Of course, that was the cost savings feature for the intank precipitation process also.

One of the alternatives being considered for that process is a smaller version in a smaller tank, so that you can control the process. The process was approved in laboratory process.

So there was testing there. And in a lot of these projects, particularly first of a kind, it's in the conversion of that testing at a lab scale, and then a prototype scale, onto a full production scale.

In some cases, as in DWPF, some portions of that system were tested at full scale. Dave just mentioned the pit disassembly

is being worked -- that process at a full scale. And there are some processes that can be better done at a full scale than others.

I don't know if you had any other examples, but --

SENATOR LEVENTIS: I guess what I'm getting at is, those particular programs, no one thought that they would fail to succeed, but unfortunately they did. I'm just wondering how the department is trying to take that into account in terms of the mixed-oxide fuels, which, to my knowledge, the mixed-oxide fuels using weapons-grade plutonium have not on any scale been done before.

MR. NULTON: The question is use the of weapons-grade plutonium to do that.

MR. HUGELMAN: In France we don't use the military plutonium for MOX fuel. We use only civilian plutonium coming from reprocessing of used civilian fuel coming from the nuclear power plant, VDF from France, the other customers of Cogema, means utilities coming from Japan, Germany, Switzerland, Belgium.

And in fact, the process which is

used to produce MOX consists of mixing some borders -- (inaudible) uranium border and plutonium border, under processes exactly the same.

It's different from the release of plutonium, civilian plutonium or military plutonium. Oxide -- you mix it with uranium -- (inaudible). It's exactly the same process. But we don't use military plutonium in France.

SENATOR LEVENTIS: Right. And we expect some differences, I suppose.

The question is: Have we already started designing this plant before we've demonstrated on a scale of about 5 tons per year that we can extract the pits?

I take it you're saying, David, that out in Los Alamos they are doing a production rate of about 5 tons a year. And my concern and my question is: Have we started designing full-scale plants yet, and where are we in the testing of the fabrication of MOX fuel using weapons-grade plutonium?

MR. NULTON: Let me be clear on the demonstration at Los Alamos. This is a full-scale line, but there will be multiple

lines required in the actual pit conversion facility. So it is not processing 5 tons a year at this point in time. It's just demonstrating with different types of pits that we can take pits apart and convert them into an oxide powder. So we have a larger through put facility that will ultimately be used at Savannah River for processing those pits.

Also, in the case of the MOX plant, the through put will be 3-1/2 tons a year as opposed to 5, because we're proposing to use immobilization for the balance of that 5-ton-per-year capacity.

I think what Mr. Hugelman was saying here is that, from the fabrication point of view, the process is the same using the weapons plutonium or the recycled plutonium for the fabrication of the MOX fuel. Chemically it's the same, as I understand.

SENATOR LEVENTIS: What about with the demonstration at Los Alamos and also with the fabrication, are the rates of waste generation consistent with what the '96 Environmental Impact Statement said and all th estimates that we have available to us?

MR. NULTON: We have prepared and released a couple months ago a supplement to the draft EIS.

The way this process worked was, we prepared a draft Environmental Impact Statement and then in our procurement of a contractor for the MOX program, we asked for environmental data to be submitted as part of their proposals so that we could take actual data from actual facilities and processes that were being proposed for use.

We took that environmental data and updated our analysis. We issued -- an environmental critique was prepared, and we issued a synopsis of that critique for public review. Then we also took that information and prepared a supplement to draft EIS, updated it using the most recent data from the procurement.

In there we updated our waste streams, and for the most part, the environmental impacts and waste streams were not significantly different. There were some -- in the case of true waste and low-level waste, the numbers went up from -- in the case

of true waste, from .5 liters to 500 liters. In the case of low-level waste, from .3 liters to 300 liters.

SENATOR LEVENTIS: For --

MR. NULTON: This is waste produced per year. That's transuranic waste produced per year, and low-level waste produced per year.

SENATOR LEVENTIS: Five hundred liters?

MR. NULTON: Liters, yes. This is a relatively small amount, low-level waste as well. I think Savannah River has a low-level waste processing capacity of 1.9 billion gallons per year. So 300 liters is 75 or 80 gallons per year. So it's a relatively small amount compared to what these sites normally produce.

Those numbers were different for two reasons mainly. First of all, we now had an actual process that we could use to identify what those waste stream volumes were.

Secondly, we added a polishing process on the front of the MOX plant, which added to the waste produced in the MOX plant.

So those numbers were different.

Others numbers changed, as well. Some went down. Some went up slightly, but for the most part, the numbers were not significantly different.

SENATOR LEVENTIS: Now, is this taking into account -- or tell me now, have you all decided to go with more of a wet process than the originally proposed dry process for production?

MR. NULTON: No, one of the chemical constituents in weapons plutonium is a metal called gallium. It was introduced into plutonium at a volume percent of 1 percent. It helps with the fabricability of the weapons pits. It can be a problem for the cladding of the fuel and reactors.

So in the procurement, we gave the proposers an option to remove that gallium using a dry process, the pit disassembly, conversion facility, or using a wet process on the front end of the MOX facility.

This is not a full-scale chemical processing capability. It's a small chemical plant that will just remove that gallium

material.

In the case of the Duke Cogema team, they chose the wet processing step on the front end, so that is what we're using now as our reference case.

SENATOR LEVENTIS: And that is what changed the amount of waste?

MR. NULTON: That does increase the amount of waste that we have out of the MOX facility, yes.

SENATOR LEVENTIS: Are those changes going to affect the startup date?

MR. NULTON: No, they're not. In fact, my guess is they actually make the schedule much more achievable because the removal of gallium using a dry process, using what we were calling the TIGR -- I can't remember what TIGR stands for now -- Thermal Induced Gallium Removal. TIGR is what we call it, Thermal Induced Gallium Removal.

This would have been a process used in the pit conversion facility. It was very developmental. Although we had done some preliminary work on it, we were not getting the gallium levels down as low as we would have

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liked. By using the wet chemistry approach, we get them down to extremely low levels which are acceptable to the utilities, so I think in terms of development in time, the dry process would have taken much longer to develop. The chemical process is well understood.

In terms of cost, the TIGR process would have cost on the order of $50 million to develop, and although we still need to get some more preliminary design done to get a good cost estimate, it will be on the order of, perhaps, $50 million, as well, so I think it's a wash with the cost.

SENATOR LEVENTIS: Pardon the pun.

MR. NULTON: Yes. Sorry.

SENATOR LEVENTIS: When do you expect testing to be complete for the pit conversions and the immobilizations?

MR. NULTON: Do you know? 2002 for the pit conversion.

SENATOR LEVENTIS: And the design is taking place now, though, of the production facility?

MR. NULTON: In the case of pit conversion, it has not gotten started, but

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probably started within a month.

MR. SELBY: That's right.

SENATOR LEVENTIS: Let me proceed.

Are there any penalties that DOE or the government have to pay to contractors if parts of this program are not ready when -- with the schedule that has been proposed or contracted for, I should say?

MR. SELBY: You're right. We need to explain that there is -- at least in the MOX fuel fabrication facility, part of the plutonium disposition -- a base contract that is laid out for preliminary design and final design of the MOX fuel fabrication facility and also at the reactor sites.

That program would go through about 2003 before we're ready to move to a new option, which is the option for construction, and we will not move into the option for construction until such time that the Secretary makes a decision that the processes that will support it -- the Russian program that will support the MOX disposition is in place -- so we do have what I would call the offramp, if there are major problems there at the end of

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the design effort in the MOX disposition contract. We do not have to proceed to option one.

SENATOR LEVENTIS: I don't want to take you all too far afield from technical matters, but is it fair to say that the impetus for this program is diplomatic and deals with our relationships with Russia more than it does with a technical decision that this was the avenue that we should take?

MR. NULTON: I think the impetus for this program is primarily the concern over the Russian plutonium materials, getting them initially into safe, environmentally sound storage, but then getting them into some disposition path, so they cannot be reused with weapons or be converted to another nation where they can be used as weapons.

SENATOR LEVENTIS: We've got a series of questions we'll ask you on that on the second page, but let me get back to the questions before us.

As part of this process, is the Department of Energy or the government going to pay the uranium industry for any declines in

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sales of fuel prices that they may experience as a result of the replacement of uranium fuel with the MOX fuel?

MR. SELBY: It's such an insignificant amount. Considering the total amount of nuclear reactors that are used in the uranium field, there should be no impact for the six reactors using 40-percent MOX fuel, because they are also using uranium fuel at the same time.

SENATOR LEVENTIS: So you don't believe that there will be an impact?

MR. SELBY: No, I don't.

SENATOR LEVENTIS: Let me ask a few questions. Mr. Hugelman, I'll ask these questions of DOE first and then give you an opportunity to talk at a later point about these things so if you have some points you'd like to make, we'll get to that.

From the perspective of DOE, do you believe that Cogema's record of compliance with the laws in its home country is relevant for its potential compliance to the United States law?

MR. NULTON: Yes, and we reviewed

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those as part of the process.
SENATOR LEVENTIS: Have you made those public? Do we have available to us the records that you looked at about Cogema's compliance?
MR. STEVENSON: Yes sir, you do, in the form of an environmental synopsis, which takes the environmental information that was provided to us by DCS, which we independently assessed and verified and presented to the decision maker, Mr. Howard Canter, who's the person who was the source selection official. And that synopsis said to him that we had reviewed the environmental -- or the potential environmental -- impact of this contract, and we recommended in that synopsis that he approve the contract.
SENATOR LEVENTIS: Now, in making those recommendations, did you review information about Cogema's record of compliance in the European facility?
MR. SELBY: During the proposal period we -- first of all, we were unable to release anything to the public because we were in a procurement process.

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The procurement looked at the NRC regulations -- the recognition. The procurement recognized the Cogema plant, the Melox plant, would be transferred to the United States, and would be required to follow all of our internal NEPA requirements, our EPA requirements, and the NRC requirements.
We also requested the environmental information as a result of discharges, of whatever the discharges were to the environment from the Melox plant. Those were evaluated as part of the RFP process and were used in preparing the environmental synopsis.
SENATOR LEVENTIS: Is that information anywhere available to the public now?
MR. SELBY: That information is going to be made available, as I understand it.
MR. STEVENSON: Excuse me. The environmental synopsis has been published. It is on our electronic or worldwide web site and also is available upon request by mail.
SENATOR LEVENTIS: Now, if it were requested by mail, is it the synopsis or is it the full information?

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MR. STEVENSON: The synopsis, as it turns out, because we only had -- let me explain one thing about the difference between computing and synopsis.
MR. NULTON: I'd like to say something. I think the quick answer here, the bottom line, is this information is available, and I think when we hear Cogema speak later in the meeting, they will. In fact, in the answers to the questions that were sent to you, Senator, we gave you some of this information, and we have more this evening.
There are web sites, reports, a number of things that have been prepared by the French government that speak to the releases from both the La Hague and the Melox plant and to what extent they meet the standards and release limits in France, so I think we have some of that. I think, in the public domain, and we have more that we will speak to this evening.
SENATOR LEVENTIS: Do they meet the release limits in France?
MR. NULTON: Yes, they do.
SENATOR LEVENTIS: Do they meet the

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international treaty limits set in the 1980s?
MR. NULTON: Yes.
MR. HUGELMAN: Speaking around the releases of Cogema, we can speak around the two plants, La Hague and Melox, exactly the same rules in France. To be allowed to run such a plant, we have to have an authorization for releases. The authorization for releases is given by the two ministries in France. The F ministry and the intergovernmental ministry.
For example, for La Hague reprocessing plant, we have two authorizations. One is along the liquid discharge, and the other is along the air discharge. This is for reauthorization.
When we have such an authorization, we have to have a public inquiry. We have to have documents given to people who can read it, keep the information, ask the questions.
We have to give such a procurement to the open community because we are in Europe under the European rules, something which is named Article 47. The European community has to give them advice around the authorization, discharge authorization, and around the impact

of these releases.
Upon this information is disclosed for this procedure in France and Europe. After that when we have authorization, each month we give all of the information along what was released first to the authorities and second to the public. And we give these each month around each site. I have one for one site of Cogema. We disclose -- with all the information, all the readings in the atmosphere, in water, if we are -- on all the analyses we do on all the results of the analyses.
For example, for oxides, we would take around 20,000 samples per year. We do around 80 analyses of the samples. We give the information on paper. We send it. We print several thousand of this document. We send it to people, to the elected people, to all the communities around the plant, but we don't put that very often on the web because we have since 20 years in France a national system, Minitel. On Minitel, it's very used in France. In fact, we put information on Minitel.
On the web it's becoming more and

more popular. I think now month after month, we are getting more and more information on the web sites of Cogema. But the Minitel system is public. Everybody in France has a Minitel at home and can ask them questions.
On the other side, there is another thing which is very important that we have what we name CLI. This is an information commission. On the inside the information commission, there are some elected people, generally the president is a mayor or he's a deputy, a member of parliament.
Inside the commission there are some trade union representatives. There are some anti-trade association representatives. There are some elected people. And once every three months, there is a meeting, and we go to give all of the information to the local information commission to these people.
Each year, to finish with this topic, we disclose an informal report, and we give all of this information. These documents are public, that we give to people.
So in fact, all of the information around what we release is disclosed to the

public around all of the sites of Cogema, La Hague and around Melox. This is the same rule.
SENATOR LEVENTIS: Thank you. Has your company at either one of those plants been cited for violations of the discharges?
MR. HUGELMAN: Never, sir. We can't do that. If we did that, the French authorities would stop the plant. We can't do that.
SENATOR LEVENTIS: How about the 1980 discharge permit that you received? Have you received an update since then, or are you still operating under that permit?
MR. HUGELMAN: No. The permit we had was -- for the La Hague plant was in '84. That was for the La Hague site. I will look. The one for Melox was in '94, because Melox is a much more recent plant, in fact. And for La Hague, the last year, meaning in '98 of all the graduated amounts because we have authorization for the graduated amounts.
For example, for emissions last year on the air, it was 3.3 percent of the authorization. For the -- 0.06 percent. I

have all the information here. I have a slide. Perhaps we can show it if you want.
SENATOR LEVENTIS: We just need to make it available so folks can get it if they'd like.
MR. HUGELMAN: It was the same year after year. For Melox it's around 0.5 percent of the authorization.
SENATOR LEVENTIS: Did the company not have a proposal for a plant in Germany? Did you all bid on a plant to construct a plant in Germany to do reprocessing?
MR. HUGELMAN: Construct a plant in Germany? I think the German project a long time ago -- it was German people, a German company. It wasn't Cogema.
SENATOR LEVENTIS: Was Cogema going to be a part of a consortium there as you are here, or do you recall?
MR. HUGELMAN: I don't know because I have to say who I am. I am the Director of the Melox plant in France -- produce the MOX fuel for EDF in the next future for the Japanese utilities. I was before the Deputy Director of La Hague processing plant. I'm

here today to answer your question around Melox.

SENATOR LEVENTIS: So you're not aware how much of Cogema is owned by the French government? Do they have an ownership?

MR. HUGELMANN: Yes. A part of the French government is a little more than 80-percent. The name of the party is Total, which is another company.

SENATOR LEVENTIS: Thank you.

Let me shift the focus to the folks from DOE and talk about the agreement that you talked about earlier that was made between President Clinton and Vice-President Gore and Russian officials. Let's talk about that for a while, if you don't mind.

Is there any agreement with Russia that obligates the United States to use the MOX process?

MR. NULTON: The only agreement that will determine how much material gets dispositioned and how much will be by MOX or other means is this bilateral agreement that I spoke of earlier that will be concluded in September.

At this point, it is going to result in MOX being used in Russia and MOX being used for a portion of material in this country.

The Russians, when we first talked with them, their preference was to store their plutonium and to save it for a number of decades and use it in advanced breeder reactors.

As a result of this Clinton/Yeltsin summit that I mentioned in September of '98, the agreement was made that they wouldn't do that, they'd get rid of it sooner using some more expedient means, and that's what focused the attention on the use on commercial reactors and MOX.

So the bilateral agreement, as we call it, that will be concluded in the fall. We'll have the final agreements on how much material and what means will be used to get rid of it, and it will involve MOX.

SENATOR LEVENTIS: So do you think that that agreement will obligate the United States to use the MOX process?

MR. NULTON: It will. I mean, it will say how much we are going to get rid of

and how much will go to MOX versus immobilization.

SENATOR LEVENTIS: I know you weren't there, but I think you keep up with it. Has Russia stated that they will not pursue a disposition program if we do not pursue MOX?

MR. NULTON: They've certainly made those statements to us as we've talked with them over the years, yes.

SENATOR LEVENTIS: Is Russia planning to use the MOX process in their light-water reactors? Is that something that we're trying to compel them to do through the agreement, or where did that come from?

MR. NULTON: As I said earlier, it came from the fact that their real preference was to save the plutonium, to stockpile it, and to use it in breeder reactors in perhaps one to two decades, and then use those breeder reactors to make even more plutonium.

It was the Clinton/Yeltsin agreement in September of '98 that drove us towards a nearer term conclusion using the commercial reactors and MOX in these commercial reactors.

SENATOR LEVENTIS: So is it our idea

that they should use it in their light-water reactors or is that something they --

MR. NULTON: I think it's their idea and it's our idea collectively.

SENATOR LEVENTIS: Are we going to pay for their use of MOX fuel in their light-water reactors?

MR. NULTON: The Russians do not have the money to implement this program, and they have said that they would need financial support from the G7 countries, of which we are one: Ourselves, Canada, Germany, France, Britain, Italy, Japan. We will not pay for it all, but we will pay for a portion of it.

SENATOR LEVENTIS: And that's that same agreement that's being worked out, the bilateral?

MR. NULTON: Yes. That bilateral agreement will have some -- and again, I'm not negotiating the agreements. I don't know the specific terms. There will be provisions in there or statements by the Russians that they will need financial support from the other countries.

SENATOR LEVENTIS: I know it's not

finished, but to date, is it true that they are allowed to reextract left-over plutonium from MOX spent fuel after the passage of some time?

MR. NULTON: After the passage of some time, yes. There are provisions in the agreement, being negotiated in the agreement, that the Russians will not be allowed to reprocess any spent fuel that was made with weapons plutonium until all of that weapons plutonium has gone through the disposition process.

SENATOR LEVENTIS: At the present projection, that would be sometime after 2015?

MR. NULTON: It would be after 2015. It would be at least 10 years after whenever they began to disposition this material, which would start in 2006.

SENATOR LEVENTIS: Will the delay in reprocessing the MOX spent fuel negatively affect Russia's current reprocessing program?

MR. NULTON: I don't know that they have a current reprocessing program at this time. They don't have the money to get a reprocessing program going at this point.

SENATOR LEVENTIS: Do they have to

do substantial changes in their light-water reactors to use MOX fuel?

MR. NULTON: At the rate that they will be using the MOX, they do not need to make substantial changes to their reactors.

If they want to increase the amount of material that goes into those reactors, they would need substantial changes, as I understand it.

SENATOR LEVENTIS: Have there been any discussions of liabilities for any accidents that happen while the MOX program is in use over there?

MR. NULTON: That's part of what's being negotiated in this contract, how liabilities will be handled.

SENATOR LEVENTIS: Do you know the current status of that?

MR. NULTON: I don't know the status at this point.

There is language that's been proposed on both sides. I just don't know what the status is at this point. It's probably being negotiated literally as we speak.

SENATOR LEVENTIS: You mentioned

earlier something about an escalator out of the process if it was required. Do you think that -- do we have the ability or are we committed to stop the MOX program if there are difficulties, for example, if the Russians don't enter into the bilateral agreement?

MR. NULTON: Absolutely. If the Russians don't enter into the bilateral agreement, then we will not proceed into construction and disposition of our own material. The idea is that we will move forward roughly in step with the Russians. We both get rid of our material or neither of us do.

SENATOR LEVENTIS: Has DOE agreed, or in this agreement is there anything that will allow Russia to make MOX fuel for its breeder reactors as part of the disposition program?

MR. NULTON: There is, as part of the agreement to convert the BN600 reactor, which is a reactor built by the Russians for the purpose of breeding. But before it would be used, it would be converted into a burner -- it is a liquid metal reactor, but it would be

used to help increase the amount of material that the Russians could disposition. But it would be used as a non-breeder reactor for that purpose.

SENATOR LEVENTIS: So the agreement, as you understand it to date, doesn't allow them to --

MR. NULTON: It does not allow them to breed in that reactor. That's correct.

SENATOR LEVENTIS: So as you look at my sheet, question number 14 is obvious, that we're not allowing them to, according to the agreement, as it's stated now, create any additional quantities of plutonium.

MR. NULTON: That's right. The Russians have also proposed an additional liquid metal reactor, and we will not agree to do that. Since this one already exists, and it can be used as a burner, we are negotiating whether the -- the use of that reactor burning plutonium.

SENATOR LEVENTIS: We talked a little bit about -- or we talked a lot about the state of our program and its development and the design of our facilities.

Where are the Russians? Are we exporting our technology to them? Where are they in their process of trying to set up fabrication facilities, extraction facilities, et cetera?

MR. NULTON: We have been working with the Russians in technical studies and developments and demonstrations for about three, three and a half years, actually working with them on immobilization as well as other technologies.

We are also working with the Russians to do a demonstration for pit conversion, probably with a different process than we're using, but we are working with them to get a pit conversion demonstration up and running. That will later be expanded so they can handle more pits, larger additional lines to handle their pit conversion.

There is also some discussion going on between ourselves and the French and the Russians regarding design of a facility for MOX fuel fabrication.

SENATOR LEVENTIS: Before we leave that subject; I need to ask Mr. Selby, because

I passed it up and didn't ask him that. We talked about the ITP, the problems that happened there for whatever reason. I'm certainly not technically capable of understanding it, except that it seemed that large-scale intank precipitation didn't work because of controlling heat or whatever, and we've talked about multiple lines as opposed to one line that runs a large capacity -- several lines that run in a capacity to produce.

Are there any problems that are inherent in several lines in a nearby area versus one line as we have now out in New Mexico?

MR. NULTON: The only thing that -- and these kinds of considerations are taken into account when you design the plant, would be practicality concerns. You don't want to get too much material --

SENATOR LEVENTIS: Too close?

MR. NULTON: -- too close. That is part of the design process is to make sure that you have adequate space and lines and so forth.

SENATOR LEVENTIS: Before I leave that, is there anything else you all would like

to say about the proposed negotiations that would help us consider these issues?

MR. NULTON: I can't think of anything I would want to add.

SENATOR LEVENTIS: Well, at any point you want to add something, please let me know.

MR. NULTON: Okay.

SENATOR LEVENTIS: Let me shift the focus now to storage because it has a lot of implications for South Carolina, and there's a lot of interest in those things.

Did DOE fail to fulfill a commitment it had made to the Defense Nuclear Facilities Safety Board to build a special storage facility called the APSF facility for plutonium at the Savannah River Site? You may know what I'm talking about.

MR. ANDERSON: Yes, actually, the commitment was to stabilize and put into long-term storage plutonium materials from Savannah River Site, and also would be Rocky Flats, and Hanford at some point.

And a part of that commitment then would -- was the construction and operation of

the APSF, Actinide Packaging (sic) and Storage Facility, which would have stabilized both the plutonium materials at Savannah River, and we were also looking at the stabilization of materials from other sites at Savannah River, even though the baseline plan was to stabilize those materials at Rocky Flats before shipping to Savannah River or stabilizing at Hanford.

We went into an evaluation process in the December time frame, largely due to the three new missions, and taking a look at this facility, and what we were planning to do with it, to make sure we were going to be designing and constructing an appropriate facility.

SENATOR LEVENTIS: Has anything come from Rocky Flats to Savannah River Site?

MR. ANDERSON: None of the material that was planned for that stabilization process. There are some materials from Rocky Flats that are going through the canyons now, as we speak, are being stabilized in the canyons at Savannah River.

SENATOR LEVENTIS: Are they in the same chemical form in containers that they arrived at at Savannah River Site?

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MR. ANDERSON: I just got your question. You had a series of questions there. I'm going to try to answer a couple of those.

SENATOR LEVENTIS: Please.

MR. ANDERSON: The materials that are going to be stored at Savannah River will be received in accordance with a storage standard, which is for long-term storage. And that would be the same standard that is used for the materials that we would stabilize. It would require stabilization material in those containers. And it also sets up requirements for the containers themselves, which are double containers, double type containers.

Materials that are not received in that condition will be processed and stabilized either right now at this point, through the Canyons, or we won't be receiving them in another process if we don't have another disposition path for stabilizing that material.

SENATOR LEVENTIS: The ones that are received in satisfactory condition, how long can they be stored there at Savannah River Site before they have to be removed from the containers and processed or immobilized?

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MR. ANDERSON: The ones that are in satisfactory condition --

SENATOR LEVENTIS: When they arrive.

MR. ANDERSON: -- when you say that would meet the standard, the standard is referred to as a 3013 standard, and that's a 50-year standard. Materials that are stabilized according to a 3013 standard and packaged according to that standard are good for at least 50 years.

SENATOR LEVENTIS: I wish I were. I don't feel like I'll make it another 50.

Anything else you'd like to comment on that because I'd like to turn my attention to Mr. Nesbit, if you don't mind.

MR. ANDERSON: The only other comment on the APSF material storage was, the receipt of those materials at Savannah River Site was dependent on the record of decision for the disposition path. So Savannah River was not receiving materials that it did not have a disposition path for.

SENATOR LEVENTIS: And the ones that you received that you judged not to be appropriately stored -- and I know that happens

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on occasion -- what do you do with those? What's the process there?

MR. ANDERSON: Currently they are run through the canyon processing facilities, which is a chemical processing facility for those materials.

SENATOR LEVENTIS: Let me turn my attention to Mr. Nesbit with Duke Power. We appreciate your coming. I've got a series of questions I'd like to ask you. Do you have those?

MR. NESBIT: I have a sheet here I got a couple of minutes ago with questions there.

SENATOR LEVENTIS: It's got Duke in the middle?

MR. NESBIT: That's the one.

SENATOR LEVENTIS: Okay, how much confidence do you have in the Department of Energy's overall performance in meeting their contract obligations? And of course, we're talking about some specific matters in terms of waste fuels and the like?

(Laughter.)

MR. NESBIT: Well, whenever we enter

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into a contract with any other person or organization, we always expect them to live up to their contractual obligations, just as we intend to.

SENATOR LEVENTIS: But has that been the record, especially in terms of waste matters to this point in time?

MR. NESBIT: Problems sometimes arise in these types of relationships.

SENATOR LEVENTIS: Are you all -- you all being Duke Power -- presently involved in a legal action against the department in terms of the waste?

MR. NESBIT: Yes, we are.

SENATOR LEVENTIS: Have you all looked into technical failures that the Department has experienced in recent years, such as the ITP, the Pit 9 project in Idaho, and the vitrification pilot plant in Ohio? Do those things concern you?

MR. NESBIT: We're aware that the Department of Energy has a daunting task in front of it throughout the weapons complex. As they've strived to deal with the problems that they face, there's been successes and failures.

We're also aware of some successes they've had, but with respect to this program, I want to emphasize that our confidence is in the ability of the Duke, Cogema, Stone and Webster consortium, primarily with the knowledge and technology of Cogema to design, build, and operate a successful mixed-oxide fuel fabrication facility. We know they can do it because it's been done.

SENATOR LEVENTIS: If the material is not ready in 2006, will you have incurred costs that you won't be able to recover until you actually use the fuel?

MR. NESBIT: We can adjust our fuel procurement and planning process to have flexibility so that up to approximately a year prior to actually putting the fuel into the reactor, we won't incur costs.

SENATOR LEVENTIS: Has your company been in contact with the Public Service Commission here in South Carolina about the financial implications of the proposed contract with DOE?

MR. NESBIT: I don't know. That's not my department. I personally have been in

touch with the people in our company who handle that liaison responsibility, but I don't know for a fact whether they have or have not had discussions with the Public Service Commission.

SENATOR LEVENTIS: Would you please let us know when you can the status on that particular issue because that's what most directly affects the folks of South Carolina in terms of any costs or savings they may expect?

MR. NESBIT: Certainly, I'd be glad to.

SENATOR LEVENTIS: What would be the impact if the Department is unable to pay the expected fees involved on Duke?

MR. NESBIT: Well, I'm not sure that -- I guess the question is more like if the Department is not capable of delivering the fuel because we anticipate paying the consortium for the fuel.

We will have a contract. We have a contract and will have a contract with the Duke, Cogema, Stone and Webster consortium. We don't have a contract directly with the Department of Energy in this program, and we don't anticipate having one, so the impact will

be, if we don't get the fuel, we don't pay for it.

SENATOR LEVENTIS: If you're familiar with this part of the contract, please tell me. If you're not, then I'd like for you to see if you can determine it for us.

Do you feel that your company is contractually bound to pay fuel offset credits to the government?

MR. NESBIT: I think, as I understand the question, we are. The fuel offset credit is what you refer to as the value of the displaced uranium fuel that would have been used had we not loaded mixed-oxide fuel in the reactor, and we will pay for the mixed-oxide fuel, so that is essentially the value of the fuel to us, which --

SENATOR LEVENTIS: The value of uranium has varied substantially in the last several months, years. What if the value of uranium is such that the mixed-oxide fuels are an expensive proposition, vis-a-vis uranium, at that point in time? How will ratepayers of South Carolina be affected by that?

MR. SELBY: Senator, maybe I could

help you with that.

SENATOR LEVENTIS: Sure.

MR. SELBY: In the formula you may have seen in the contract, the ratepayers of South Carolina are not at a risk with that.

The fuel offset is the offset of the 40-percent MOX fuel that is being used by Duke and Virginia Power in their reactors.

There is a savings if you -- and I do have a chart on it to show the rest of the audience -- F factor is between .5 and .9. That F factor allows for the ratepayers not to have to pay full value for the LEU offset. In other words, they get the MOX fuel at a slightly decreased price over the current LEU fuel at that particular moment in time.

SENATOR LEVENTIS: Since the LEU fuel has decreased in cost recently -- and of course, we don't know what it will do in the future -- but since that's happened, does that make the program more expensive for the Department of Energy now?

MR. SELBY: As LEU fuel prices decrease, and if they do, the offset, yes, will be more expensive for the Department.

However, in any program -- this is a program to dispose of materials -- you're going to have a price. The taxpayers, not the ratepayers, are the people who do pay for both the fabrication of the weapons, and now we unfortunately will be paying for the disposition of the weapons.

There is a, as I said before, only a slight offset that we'd give the ratepayer -- would not allow the ratepayers to pay any higher utility bills if they were using MOX versus LEU.

SENATOR LEVENTIS: This is a little more technical question, but please follow me if you can.

In the material that you've sent, the fuel fabrication facility was, I believe, listed at a cost of 250 million. Was that after you had subtracted the 930 million projected fuel displacement credits from the 1.18 billion?

MR. SELBY: I'm not sure where that number came from. I think our design-only CDR estimates the cost of the MOX fuel fabrication facility, I believe, at around 450, 480.

The fuel offset is still the fuel offset credit. I mean, we're going to be offsetting LEU fuel with MOX fuel. It's going to be a number based on whatever the price uranium is at the particular time.

That full offset will not be, though, available to offset the cost of operation, complete cost of operation of MOX fuel, because part of that offset will go to the -- to assure that the utility ratepayers will pay no more than the price of LEU fuel.

SENATOR LEVENTIS: Than they otherwise would have paid on other costs to the utilities, besides the cost for fuel, any other changes in the facility, administrative costs, et cetera?

MR. SELBY: The changes in the facility are addressed in what we call -- there's a clause H11 in the contract. In that clause, we address that if there's a cost to the utility that is caused specifically by the use of MOX fuel, whether it's a change in equipment, because of the use of MOX fuel, or whether it's increased regulatory oversight or inspection, the Department will pick up those

additional costs.

Now, remember the first two -- the first two phases, the base contract and option 1 are cost reimbursable contracts.

Option 2A, which is the hot startup, is also a cost reimbursable contract, and then never go into the operation of the facility in option 2B.

SENATOR LEVENTIS: What is the likelihood that the NRC may not be as excited about MOX fuel as everyone else? I mean, is there any likelihood that NRC would change the cost structure to Duke in a way that we haven't projected with their requirements? How much are you planning for NRC requirements to cost, which are reimbursable, I take it?

MR. NESBIT: Well, we certainly anticipate -- the licensing costs are reimbursable under the contract. We certainly anticipate the Nuclear Regulatory Commission will be a vigilant oversight organization as they've always been with our reactors. I don't anticipate anything other than that.

With the public interest that's involved with this program, they will be

careful, and I'm sure they'll discharge their responsibilities appropriately.

We certainly anticipate that we'll need some minor modifications at our plants in order to demonstrate that we can safely operate with mixed-oxide fuel, both to our own satisfaction and to the satisfaction of the Nuclear Regulatory Commission.

SENATOR LEVENTIS: Have you all already made that application?

MR. NESBIT: No, we're going -- our current plans are to submit the application for a batch scale utilization of mixed-oxide fuel at the end of 2003. So there's quite a bit of time between now and then.

We're going to use that time to do the detailed plant-specific studies in order to quantify the impacts of using MOX fuel, and identify any required modifications, and to design those modifications.

SENATOR LEVENTIS: We've been going for quite awhile. What I'd like to do is to give Ms. Jeter a rest and to recognize those folks, such as Senator Courson, who have been very patient, Representative Clyburn, to see if they have any questions. Then I'd like to take about five minutes to give her a chance to catch up, and then reconvene, and we should be ready to discuss some things from the audience.

There are also issues dealing with the cost factors in the Environmental Impact Statement, and I'd love to give you all a copy so we'll all be reading off the same sheet. I don't want you to have to guess where we are, and try to lead us through some of those steps.

Senator Courson?

SENATOR COURSON: I have just one basic question involving the DOE, I guess.

You mentioned the three and a half years we've had bilateral negotiations between the United States and Russia. Does that include -- are we having similar negotiations with other provinces -- former provinces of the Soviet Union, like Ukraine, Belorussia, and others that possess nuclear capabilities, or is this just isolated to bilateral between the U.S. and Russia?

MR. NULTON: It's just between the U.S. and Russia at this point.

SENATOR COURSON: Follow-up would

be: Do you anticipate any negotiations between the United States and other former Soviet Union provinces that have nuclear capability and nuclear weapon systems?

MR. NULTON: My understanding is the weapons all came back to Russia. That's why we are negotiating.

SENATOR COURSON: All the weapons are back in Russia?

MR. NULTON: That's our understanding.

SENATOR COURSON: All the weapon systems, nuclear weapon systems formed in the Soviet Union are back now in Russia?

MR. NULTON: That's my understanding. There may be some materials still in these other countries, but I believe the weapon systems are back in Russia. There are no negotiations at this point in time with any other provinces.

SENATOR LEVENTIS: Thank you, Senator Courson.

Representative Clyburn, did you have any questions you'd like to ask?

REPRESENTATIVE CLYBURN: I do not

have any questions. I just wanted to observe.

SENATOR LEVENTIS: Well, we certainly appreciate your presence and everyone's patience. We appreciate your sitting through this, and we'll get to some of your questions after the break.

It is now, by the clock on the wall, five minutes to eight. I'd like for us to get back together at five minutes after eight.

(A recess transpired.)

SENATOR LEVENTIS: Thank you, I appreciate your patience. We didn't start on time, but that's my fault.

I'd like to pursue a line of questioning now regarding some financials. I wanted to recognize Ethan Brown to go over some of the financial information that was in the EIS, and I think the draft EIS.

Then I'd like to recognize Dr. Makhijani for a couple of questions. We will reassemble our thoughts, and then we'll proceed from there.

And of course, I've invited the gentlemen from DOE or Duke or Cogema to make any comments that they'd like to make if they

feel it would help the process.

MR. BROWN: Thank you, Senator Leventis, for having me here.

I just want to try to clarify my understanding of some issues as they were addressed tonight and as they have been addressed in public documents that DOE has presented.

I hope you guys have a copy of -- this is the EIS technical summary supporting document. I think they're passing those out right now.

This gives a value of 930 million for the fuel displacement credit. And my question is -- I guess two parts to it -- the first is: What level of certainty would be required to include that as the 930 million dollar offset credit given the price of uranium fluctuating?

And the second: Why is there no mention in the EIS of this fraction F that will allow the reactors to withhold up to 465 million dollars from the government, thereby increasing the total cost of the MOX program by that amount?

MR. SELBY: Okay. The first point is, the contract has just been recently, as you know, negotiated. March 22nd is when we completed the negotiation.

There will be a revised cost report that comes out with the final EIS that will reflect the negotiated agreements.

MR. BROWN: If I were to take the .5, then I would be correct in adding to the 250-million-dollar net lifecycle cost, 465 million dollars?

MR. SELBY: As I said before, the .5 to .9 are the ranges. I can't tell you the exact number.

MR. BROWN: Just go with half?

MR. SELBY: Yeah.

MR. BROWN: So I would add that amount to the cost of the fuel fabrication?

MR. SELBY: The .5 would be -- exactly, the credit would be increased.

MR. BROWN: Okay. My second question relates to the decision in the EIS literature to exclude the payments of annual fees, even though those in the contract are presented in the very same equation that the

fuel displacement credit is discussed, and it reminded me a little bit of folks who run into problems on Wall Street, where they go ahead and present to the SEC their accounts receivable as certain but discount away their accounts payable. I'm wondering what the decision was to include a potential credit to the government but exclude a potential cost when they're both contained in the exact same payment equation. What was the reasoning behind making the difference between the two?

MR. SELBY: I guess I'm not sure exactly your question. Would you repeat it?

MR. BROWN: Sure.

SENATOR LEVENTIS: Do you have the equation in front of you?

MR. NESBIT: Bob, I think he's talking about the 1996 cost report.

MR. BROWN: I'm trying to reconcile that with the contract.

MR. NESBIT: The 1999 contract.

MR. BROWN: Right, the payment formula has included it in this annual fee. I'm wondering why that was excluded from these cost estimates.

MR. SELBY: Again, I'm sure those cost estimates were prepared prior to the contract being negotiated.

Let me tell you about -- so there's no misconception -- this cost containment formula starts, as you're probably aware, at option 2B, when we start getting the full operation of the MOX fuel fabrication facility.

The fabrication costs would include whatever the operating costs are. These are the operational costs, with the LEU as being revenue, being the offset minus the percentage of the formula, either the .5 to .9 that I talked to you about, so that was what we negotiated. I can't speak to the cost.

MR. BROWN: Okay, but I guess just what I want to make clear is, in the final EIS, then this annual fee and its value would be included in the total cost.

MR. SELBY: The annual fee actually hasn't been negotiated yet.

MR. BROWN: But it will be included at --

MR. SELBY: Some number for that annual fee is what you're asking?

MR. BROWN: Would it be fair to say that the estimated, what, 300 million that the Department has put out in two separate documents is an accurate estimate of how much that annual fee will be over the lifecycle?

MR. SELBY: What our estimate has been, at least in terms of what we did for the negotiations was, that we estimated that the cost of operating the MOX fuel fabrication facility would be somewhere between 55 and 60 million dollars a year.

MR. BROWN: I think I'm speaking about the fee as opposed to the cost. I know in the contract they draw a distinction between the two, and they estimate in two documents, one, this '96 technical summary, and two, the one coming out of Oakridge, I think, in April of '97, that says the value of the potential annual fee will be 300 million dollars, and that's included nowhere in the official cost estimates. I'd just like to know whether that's going to be anywhere.

MR. SELBY: I don't recognize that number.

MR. BROWN: Okay.

MR. SELBY: What we plan, the cap on fee, as far as the Department is concerned, is 10 percent. At 50 to 55 million dollars a year, we're talking maybe 5 million dollars, maximum 5.5 million dollars.

DR. MAKHIJANI: I think there's a miscommunication going on. If I might try to clarify. I think Ethan is asking about the fee to the utilities, this annual fee in the cost formula regarding fuel reimbursement.

MR. SELBY: Oh, the production --

DR. MAKHIJANI: The annual fee to the utilities you would pay them for the MOX irradiation services, how much is that, and the fact that it's not in the EIS. I think you're misunderstanding.

MR. SELBY: I'm sorry. Yes, pardon me. I am off base on that.

What we've done is, we've done a sample calculation. I chose the mid-point of F equals 0.7. You can choose 0.5 to figure out what it is that we're talking about.

On an annual basis, the reload of 40-percent MOX core will offset -- a total reload will cost about 42 million. About

40 percent of that then would be the LEU -- the MOX fuel. And if you use the -- I use, again, the .7 for my calculation, I come out with about 5 million dollars a plant, out of the 42 million that would be spent on a core as a reduction in cost for the utility.

Now, if you take that on the total cost of nuclear operation, which includes O&M costs and other costs like depreciation and taxes, et cetera, the actual savings in nuclear generation, I calculated, is about 18 percent, that five 104 -- 5.04 million or about 2.1 in overall savings to a utility for using MOX fuel. Again, I used it based on a 42-million-dollar reload.

The numbers I used to calculate the O&M cost were about 14 percent for O&M, 15 percent for other costs, 6 percent for nuclear fuel.

And if I want to put in the transmission costs, which are, again, 65-percent of the total cost for the consumer to receive electricity, in terms of seven mills per kilowatt, seven cents per kilowatt hour, I come up with reduction on the overall plan of

only about .8 percent. If you take the total value of what it takes to produce electricity and transmit it to the --

MR. BROWN: I appreciate your thoroughness, but I think -- I had a much more simple question, and that is: The Department knew in 1996 that this annual fee may be required, and the annual fee they estimated at 300 million dollars to pay out to the reactors to participate in this program.

MR. SELBY: Uh-huh.

MR. BROWN: I want to know why they didn't include that in the official cost estimate, and why they decided to include the 930-million-dollar fuel offset credit.

MR. NULTON: I think, first of all, we need to -- the cost estimate we did back in the past was based on our best guess at how this fuel was going to work at that time.

Now we have actual numbers and contracts in place. I think we ought to focus on what the current arrangement is because this is more accurate.

Can you say, Bob, what the maximum fee to the utility would be a year, based on --

MR. SELBY: Well, this is, again, a 5-million-dollar offset based on a 42-million-dollar core replacement. That five million, though, then has to be compared to what is the total overall -- I mean, if we're concerned about utilities having a windfall, I mean, you've got to really compare that 40 --

MR. NULTON: Is the number anywhere near 3 hundred million?

MR. SELBY: The number at -- let's see. It could be about -- if you take it over the life of the 13 years.

MR. BROWN: So can I just then recalculate the cost -- or in this EIS to update it to the level of knowledge and understanding we have now? If I take .5, which is just saying we'll split the factor in the middle, right, then I get --

MR. SELBY: No. The factor runs between .5 and .9.

MR. BROWN: Okay. Fine.

MR. SELBY: You're taking the worst case, and that's okay.

MR. BROWN: Well, I didn't know the value of that.

MR. SELBY: No, no, no.

MR. BROWN: I'm just saying 495. I'm going to add that to the 250, right? Then I'm going to go ahead and add the 300 million. So that's a much more expensive program than initially estimated. That's like four times the cost of the immobilization program.

MR. NESBIT: You're including an incentive fee of 300 million, plus a fuel discount. That's double counting.

MR. SELBY: You can't do that because the fuel discount is their incentive.

MR. BROWN: Okay. That's not how it's laid out in this. So the total incentive payment or annual fee to the participating reactors would be something like 300?

MR. SELBY: No. On an annual basis, on an annual basis --

MR. BROWN: Over the course --

MR. SELBY: -- per core load, it's about 5 million dollars.

MR. BROWN: Okay.

MR. SELBY: Per core load.

MR. NULTON: Which is every 18 months.

MR. SELBY: But on average, it's going to be three to four --

MR. BROWN: So it would be fair to say then it's going to be approximately double the cost of what was in the EIS estimate, if you take that --

MR. SELBY: I'm not -- I've got to look at the EIS. I'm not --

SENATOR LEVENTIS: I think what would be reasonable to do would be to ask you to take a look at that and provide for us, if you would, when you can, what you think lifecycle cost would be, vis-a-vis, this '96 --

MR. SELBY: Absolutely. It's going to be revised in issue with the EIS. It is --

SENATOR LEVENTIS: When -- do you have any guesses?

MR. NULTON: Yes, September.

SENATOR LEVENTIS: No, not when the EIS is --

MR. NULTON: I think what Mr. Selby was saying was, it isn't 300 million -- you said it's possible it could be 300 million, but that would be over the life of the program --

MR. BROWN: That was my understanding.

MR. NULTON: -- for the whole 10 to 15 years, not per year.

SENATOR LEVENTIS: Right.

MR. BROWN: And that's what I just wanted added --

MR. NULTON: Big difference.

MR. BROWN: So we're in agreement. That's fine. So it's going to be roughly double over the lifecycle of the program is my understanding, based on what you said.

MR. SELBY: I --

MR. BROWN: For the actual reactor component you have 290 million; and I'm saying, given the fact you'll be paying out over the lifecycle 300 million in fees that weren't included in this estimate, given that consideration, it's going to be roughly double.

MR. SELBY: I don't think I would agree. I think that if we -- let's walk through the formula. We know that we're going to spend 50 million dollars to 60 million dollars a year for the MOX fuel fabrication facility. That includes the fee for the consortium, 60 million a year.

We know we have an LEU offset. We produced 58 -- as you know, the plant runs at -- I think it's about 58,000 -- let's get the numbers here, 58 metric tons per year.

With that, you can do the calculations using either F of somewhere between .5 and .9. You can choose .5, since that's the worst case. You know the LEU offset value. It's 40 percent of the total core load, which is approximately 42 million dollars.

So you know what the utility would get. You know what the MOX fuel fabrication facility costs are. You can use the 10 percent -- less than 10 percent for the annual fee MOX fuel, which adds up to a 60-million-dollar MOX fuel fabrication cost.

So what we're looking at for a maximum liability to the government -- let's say the uranium prices are at -- again, I used an F factor. I'll give you an example of .5. We'll end up paying on an annual basis about 34 million dollars over a 15-year life.

MR. BROWN: Can I ask one other question?

SENATOR LEVENTIS: Please.

MR. BROWN: I just wanted to clarify a discussion that we had about the cost of the plutonium polishing addition.

It was suggested there was going to be no increase in schedule and no increase in cost. I think it was said it was going to be a wash.

I'm just having trouble reconciling that with a number of statements in the different DOE documents that listed anywhere from costing an additional 50 million to costing up to 250 million.

What am I not seeing in the documents that you're seeing?

SENATOR LEVENTIS: What documents are you taking about, Ethan?

MR. BROWN: The technical summary report for surplus weapons usable plutonium, October '96; then the 1997 study that Oakridge did.

I mean, does that pretty much directly suggest there's going to be an additional cost and a schedule increase?

MR. SELBY: I think, first of all, we don't believe that there will be a schedule

increase. I think we looked at that when we were analyzing the schedule that was proposed by Duke, Cogema, Stone and Webster for the project.

What does happen is, we reduce the length of the time of the fuel qualification program, as Dave Nulton stated, by removing the gallium and other potential impurities in the weapons-grade material.

So I think it -- although we haven't had a design done as yet of the polishing facility -- there's no indication that the design will require a longer schedule in terms of construction, nor that the cost will be significantly increased from the estimate.

MR. BROWN: I just want to read then for the record this DOE document says, The sunk cost of the -- the dry processing would be, approximately 50 million, and then an additional 50 million for establishing the wet polishing line, and a two-year increase in schedule. It says, Articles in trade press suggested the cost be as much as 250 million or higher. And that's Dr. Reed and Dr. Miller, April '97, Oakridge.

MR. NULTON: I don't know where the article -- the number of the trade press came from. I don't think it was one of our numbers.

MR. BROWN: That's fine. Just go with 100 million.

MR. NULTON: My point earlier, my comment was, when you look at the dry gallium removal process, it involved a substantial amount of R&D work and time to do that. It involved a substantial amount of fuel testing in the ATR reactor. We no longer have to do that, so there's a lot of cost savings there.

We also would have had to produce a larger number of lead test assemblies, which we now don't have to do.

So when you look at the savings and lead test assemblies, which each one of them has a fairly significant cost, the fact we don't have to do the R&D, and we don't have to do the test and ATR, there's an enormous cost savings there.

That's going to be offset by the fact that we do have to design and build this AVS acqueous polishing, so I'm saying they offset each other somewhat.

MR. BROWN: Can you just explain, though, how the sunk costs becomes a wash?

MR. NULTON: The sunk costs are there. We can't go back and cover those. We hadn't sunk very much that would have been a -- we never did any work on TIGR. We never got that up and started. So we didn't spend any money on that. We didn't design the NPDCF, because we didn't design the facility yet. So I'm saying those costs were never expended.

MR. BROWN: So there was no 50 million --

MR. NULTON: No.

SENATOR LEVENTIS: Dr. Makhijani, do you want to proceed?

DR. MAKHIJANI: I had some questions about the Russian or clarification about some parts of the Russian program.

Mr. Nulton, you said that you're not aware of a Russian reprocessing program. So far as I'm aware, there's a reprocessing plant, a military plant, operating approximately as of the 26th.

MR. NULTON: I'm not aware of a civilian reactor --

DR. MAKHIJANI: There is a military plant, Thomas 7, and there is a civilian plant, RT1 at Mayak in Southern Europe. And that is the reprocessing plant, in fact, where not only Russian fuel is reprocessed, but a fair amount of foreign fuel has been reprocessed. All of the foreign contracts are in some jeopardy because of cost consideration, but they're still negotiating with the Bulgarians, for instance, for taking their spent fuel, new process in RT1.

RT1 has long been their commercial reprocessing plant. Isn't that right?

MR. NULTON: I don't know. I was not aware of it.

DR. MAKHIJANI: Well, I'm a little bit surprised because one of the greatest security concerns that has been widely expressed by us and by many people in the official capacity has been the 30-odd tons of commercial plutonium that has already been separated from Russian commercial plants and foreign commercial plants -- but I think it's primarily from Russian plants -- that are stored there in separated form, plutonium

dioxide form, in 12,000-some bins in Mayak.

I believe the Department has had some security concerns around this and that there is an operating reprocessing program.

One of the reasons this whole agreement is a source of concern to many of us is that the Department has gone back from the original idea that in Russia and the United States it will be a once-through program, and not allow reprocessing.

But now, as I understand it, the Russians have a reprocessing program. They've got a backlog of spent fuel to reprocess. So does it make any difference that MOX fuel would be reprocessed 10 years from now as opposed to now or ten years from 2005? Will it stop their reprocessing program in some way or upset it?

MR. NULTON: I think they clearly, at some point in the future, would like to reprocess this material, and the agreement that is being negotiated is that they won't initiate that until the disposition activity is completed.

I think the thought there is that the weapons-grade material will at least be

degraded to a reactor-grade form at that point.

DR. MAKHIJANI: Well, degraded reactor fuel can be made into weapons. It's my understanding -- I don't know if it quite confirms with your understanding -- that the main threat from Russian plutonium is not that the Russians are going to use their plutonium again in weapons. The main threat is that it will wind up in black markets and be sold to third countries or terrorist groups and so on.

Isn't that the main problem about Russian plutonium?

MR. NULTON: That is a concern about Russian plutonium.

DR. MAKHIJANI: It's not that both the U.S. and Russia have plenty of surplus plutonium, so they wouldn't use degraded plutonium in their weapons, but degraded plutonium can be used to make weapons.

So my problem is that the -- my concern that we're having, and I'm wondering why the Department doesn't share it is, the Russian reprocessing program will be going on as it is now, and is not affected in any significant way, so far as nonproliferation

issues are concerned, by delaying the reprocessing of MOX fuel. It just simply seems like some kind of paper satisfaction for the American side at having given away a very big negotiating point to allow the Russians to reprocess their MOX fuel. It doesn't accomplish a disposition purpose, right?

MR. NULTON: It delays it. There is some net destruction of plutonium by using it in reactors. And it does degrade it to reactor-grade form, which is much less desirable for weapons, so there is that gain.

SENATOR LEVENTIS: And some of the concerns that I think we ought to acknowledge that -- some of the concerns you've shared, while they're very valid, are not DOE policy issues because they're being negotiated and dealt with at a different level than that.

I understand completely what you're saying, but these gentlemen may not have a hand on that particular throttle. I think that if you can reflect on it, it would help us, but I know there's some that you can't reflect on.

DR. MAKHIJANI: I have some questions about the regulatory system in Russia and how their relicensing or licensing activities would work.

What's the condition of their Nuclear Regulatory Commission in terms of their authority over their power plants, their authority to require changes, their budgetary situation?

MR. NULTON: Well, I'm not sure, and I don't think we have the right people here to answer that. I can say that GAN, which is their Nuclear Regulatory Agency, will regulate the facilities that use this MOX fuel.

Our NRC works with their GAN to try to help in their regulatory process, but I don't know the details. We can answer those questions. We just don't have the right people here this evening to do that.

MR. STEVENSON: The funding of GAN, in order to perform their regulatory functions, is also part of the subject of negotiations, because we have to make sure that what is negotiated is a complete program, and therefore the regulation of the Russian reactors to disposition of weapons-grade plutonium is part of that negotiation.

DR. MAKHIJANI: Thank you very much for that clarification because we had heard their regulatory commission, which is GAN, is sometimes not able to pay their electricity bills, much less regulate anybody, so it has been a concern, so thank you very much for clarifying that.

Their reactors, as I understand, are not -- were their reactors designed for use of MOX fuel? Are you assuming that they would use 40-percent MOX fuel also?

MR. NULTON: No, they're not going to use 40 percent. They will use much less than that.

Again, I don't know that we have the right people here to get into the details of their reactor designs, but we do have our laboratory experts working with theirs to determine how much they can burn safely, what modifications would be required for those reactors and so forth.

SENATOR LEVENTIS: How many reactors do you believe will be involved in their MOX process?

MR. NULTON: Seven.

SENATOR LEVENTIS: Seven?

MR. NULTON: Yes.

SENATOR LEVENTIS: They're going to expend all of their fuel using -- I mean, they're going to MOX all of their fuel instead of stabilizing any of it?

MR. NULTON: They're going to MOX almost all of their weapons-grade material. That's correct. They have some chemical solutions and waste materials that they will probably immobilize. That's part of what we're negotiating in this contract, or in this bilateral agreement.

SENATOR LEVENTIS: Then it must not be simple math because we have six plants that are going to use MOX fuel for 10 to 12 years and do away with 30-some-plus tons, and they have seven that are going to use it for a similar period of time and do away with a lot more.

MR. NULTON: Except we need some additional capacity in Russia because they're going to put less plutonium into their reactors.

SENATOR LEVENTIS: Right.

MR. NULTON: So we need to identify additional reactor capacity.

SENATOR LEVENTIS: Which hasn't been done yet.

MR. NULTON: Right. That would have to come from European reactors or Ukraine reactors, or we also have a program that we're working with the Canadians, where they might possibly burn some of the Russian plutonium. So that would provide the additional reactor capacity if the Russians don't.

DR. MAKHIJANI: Finally, I really have been very, very concerned about the liability questions. It is my understanding that Russia did not consider the use of MOX in light-water reactors as part of their program until the disposition question came up, and it was brought up by the American side. Is that right?

MR. NULTON: I don't know. I don't believe their reactors were designed specifically for MOX. I'm not sure that means that they can't burn some amount of MOX in those reactors.

DR. MAKHIJANI: No, no, it's my

understanding that they never considered it because they didn't consider it a desirable thing to do with plutonium, as to use it in light-water reactors.

MR. NULTON: I think that initially they did not want to burn it in their reactors. I don't think that we talked them into it. I think this was part of the joint negotiations that we had with them.

What they wanted to do, as I mentioned, was store it and build more breeder reactors. What they wanted was aid from the G7 countries to build a series of breeder reactors. We said we would not do that so that led us logically to the use of their existing reactors.

I don't think it was a matter of talking them into it. It's just we worked out the joint agreement.

SENATOR LEVENTIS: At the bilateral negotiations and discussions, are there high level DOE officials and GAN officials as well as the vice-president and the president? Who's doing the negotiations?

MR. NULTON: The negotiations are

being done by the State Department and the Department of Energy.

We have a team of negotiators made up of individuals from the State Department and Laura Holgate, who is the Director of the Office of Materials Disposition, member of that, Deputy Negotiator on the U.S. side, and on the Russian side we're negotiating with them now.

DR. MAKHIJANI: Thank you very much.

SENATOR LEVENTIS: Gentlemen, thank you. You've been very patient, and I'm going to recognize some folks from the audience now and hope that we have time to recognize as many as possible. I'd ask you to identify yourself for Ms. Jeter, and please come forward. Make sure that red light in that little machine is on there.

Certainly, if you'd like to make a statement, that's fine. I'd like for you to ask questions. In consideration of the other folks who have been so patient, please try to be prompt.

Actually, I was going to recognize Ms. Thomas first.

SPEAKER: I'm sorry.

SENATOR LEVENTIS: It's not McDonald's. I'm sorry.

SPEAKER: Is there a list?

SENATOR LEVENTIS: Ruth Thomas with Environmentalists, Inc., would like to make a statement and ask some questions.

MS. THOMAS: I had some --

SENATOR LEVENTIS: Is the red light on, Ms. Thomas?

MS. THOMAS: Yes, but my voice is not doing too well.

SENATOR LEVENTIS: You might have to lean down a little bit so we can all hear you.

MS. THOMAS: I'm getting smaller. I've been getting smaller anyway as I get older.

We agree with the Department of Energy that plutonium must be kept from terrorists. However, the draft Environmental Impact Statement does not adequately explain how the proposed options could accomplish this.

And Mr. Makhijani, he got in ahead of me the questions about how -- if you go ahead and irradiate mixed-oxide fuel at

commercial reactors, this is only a temporary approach, and a ban on reprocessing could easily be changed, not just in Russia. It could be changed in this country.

We've addressed that, but I did want to bring it up to you because it's one of our concerns. And incidentally, Environmentalist, Incorporated has been involved in these issues for 27 years, and we have raised questions and tried to bring about awareness and to get answers to our questions.

The draft EIS appears to address the security and health problems associated with plutonium, but it's very difficult to find answers to questions due to the -- there's not much footnoting, and the connections are not made between specific references and places in the text where there are statements and conclusions.

And you have to go from one part to the other, and back and forth, and look at charts. I'm hoping this will be corrected in the final.

Some of the options suggested appear to be in conflict with what is known about plutonium. So much moving around -- I was going to try to take all those moving around because it not only seems to be moving materials from Texas to South Carolina, and then from there to nuclear reactors, but they have to get special materials from other places, and I thought it would be good to have a visual to see all of those routes intersecting and how many different areas of the country would be affected and exposed to the problems with transportation and accidents.

There's not enough justification for the proposal for mixed-oxide fuel in terms of factual data. Only a limited amount of information is included about the past history of operations which are related to other facilities which involve plutonium, particularly reprocessing plants.

There's nothing about nuclear fuel services, New York State, Cogema, British reprocessing, and all the hearings lately that went on about the bio-nuclear fuel reprocessing plant in which our organization was involved over a period of five to seven years.

These documents have information

that need to be included in references, and I've seen none of this.

Then there's the defense waste processing facility. What is the status of that, and is that available for identifying both high-level and plutonium?

As I understand it, the problem with the Savannah River defense waste processing facility is the intank precipitation process.

The releases of benzene, for example, in the development of the salt cakes, which leaves not only a fraction, as I understand it, of the sludge available for the defense waste processing. There's inadequate information regarding reprocessing and how a change in nuclear policy would affect security issues.

Is it possible to recover plutonium once the plutonium goes through the vitrification process?

I haven't given you time to answer these questions.

Options which might offer a better chance for accomplishing the goal of protecting against the theft of plutonium by terrorists or

used by other countries are not included in the draft EIS. I feel that it does not come up to the standard of the National Environmental Policy Act.

And I've got 100 other questions, but I know I want to give other people a chance. Thank you.

SENATOR LEVENTIS: Thank you, Ms. Thomas. Let me just say that you've raised a number of questions, and we appreciate that. We do want to try to get everyone in, especially if the questions have been asked before, please take those answers.

As far as specific issues in the document that are difficult to follow, I think that you need to raise some specifics to these gentlemen so that they can hopefully address those.

Some of the other questions I'd certainly defer to DOE, but I think it's important to recognize -- and I forget which one of the gentlemen said it -- the direct question about how the program was initiated for MOX, that it definitely was initiated by the administration at the State Department as

opposed to DOE although, I know there must have been consulting on the issue, but I'll defer to DOE to answer questions about the defense waste processing, security, et cetera, vitrification and reclamation.

MR. NULTON: I'll just try to hit some of the high points if I can.

The EIS does not address reprocessing because we don't propose to do any reprocessing of fuel.

The purpose of the program is to have a once-through fuel cycle, so this plutonium, once it is used in MOX fuel, would go to a geological repository and would not be reprocessed.

At this point, the United States has a policy not to reprocess fuel from commercial reactors.

With regard to the defense waste processing facility at Savannah River, the immobilization approach that we've described in the EIS does propose to use a high-level waste immobilization facility, either at Hanford or at Savannah River.

At this point in the EIS we have

identified Savannah River as the preferred site for immobilization because the DWPF is already built and is already operating, and it's less expensive and more timely to use it for immobilization.

The process that we've proposed is to take the plutonium and to immobilize it into a ceramic form, about the size of a hockey puck. Then we stack these hockey pucks in this stainless steel can, and those cans are imbedded in the high-level waste canisters that are produced in the DWPF.

We cannot mix the plutonium directly in with the immobilized waste without having to make either a new facility or substantial changes to the DWPF.

And also, there were questions on the chemistry of the glass, whether or not we could come up with a suitable chemistry if we were to mix plutonium in with the rest of the waste materials.

So the less expensive and more scheduled effective way of doing this is to immobilize it separately, and then imbed it in the high-level waste.

Can you recover plutonium from immobilized waste? Yes, you can. You can dissolve the glass. You can move the plutonium back out of the immobilized form. That's one of the concerns the Russians have raised in our negotiations with the use of immobilization.

Nonetheless, we do plan to use immobilization as one of the two approaches.

I would mention here because I may not have made it clear before, the purpose of the hybrid approach of having both MOX and immobilization was to make sure that we had at least one -- I mean, we think both will work. We intend on a track to implement both. The idea of having at least two was, if you had problems with one, you would have at least one successful technology.

As you've mentioned, Ms. Thomas, we've had problems with the intank precipitation at Savannah River. I think we'll get those resolved but it's concerns of that type that drove us from the beginning to have at least two technologies available to us so that if one ran into problems, we would at least have one remaining that would work.

SENATOR LEVENTIS: Didn't you also tell me earlier about reclamation after immobilization that it was economically more expensive to do than just to process plutonium to weapons-grade quality to begin with?

MR. NULTON: I'm not sure if I understand the question. Certainly we don't intend that we'd ever take it back out of the immobilized --

SENATOR LEVENTIS: No, we don't, but if we needed that quality plutonium, wouldn't it be easier just to process?

MR. NULTON: Oh, produce new plutonium?

SENATOR LEVENTIS: Right.

MR. NULTON: I don't know, but I suspect it would be less expensive to dissolve the ceramic pucks.

SENATOR LEVENTIS: I misunderstood that.

MR. NULTON: I think you could dissolve it fairly quickly, but I don't know.

Charlie, you may want to comment on that.

MR. ANDERSON: I'm not sure.

MR. NULTON: You need a reactor to make new weapons-grade plutonium. We don't have one right now that can do that.

SENATOR LEVENTIS: Thank you.

I'm going to call on Mary Olson. After Ms. Olson, Jim Kearse, so if you would be ready.

MS. OLSON: I'm just going to be brief tonight, but tracking this process and looking at the numbers in the supplemental EIS on reactor impacts -- this would be a question for the Department of Energy -- the supplemental EIS shows that in the rather rare event that we've had Chernobles, we've had it happen -- of a reactor accident that were to expel core materials, as in fuel, to the environment, that using plutonium fuel in reactors does increase the number of latent cancers that would be expected from that event, which clearly there would be cancers from uranium being dumped in a similar way, but there would be an increase in the number associated with using plutonium fuel.

An independent study done by Dr. Ed Lyman has also estimated this number and shown a significant increase of risk.

Working for an organization that tracks the status of the operating reactors in the United States, we're well aware of the influence of both aging on reactors, and the impact of intense heat and radiation, degrading the metals that the reactors are made of, and also the impacts of the deregulated utility environment, in terms of the needs for corporations to cut their costs and become competitive.

And those things combined with the difference between the fission physics of plutonium and the difference compared to uranium lead us to feel that there is an increased risk in the possibility of accidents, incidents, releases above what operating uranium in reactors currently demonstrates, so increased chance of an accident or incident coupled with increased consequences of such an accident or incident, we are in a need for process here. I would like a clear statement from the Department of what the justification is for exposing the reactor communities to this increased hazard.

MR. NULTON: Okay, I may ask Duke to jump in here, if you feel you have to.

I think, first of all, the events that Mr. Lyman addressed in his study were beyond design basis events. Let me see if I can put this in layman's terms. These are not normal operating kinds of events. They are very, very low probability events, one-in-10-million, one-in-100-million kind of events.

There are two or three of those events which would result in a release of plutonium.

In most events that occur in a reactor, you release fission gasses, but you don't release the actual plutonium or uranium metal that's in the fuel.

However, there are these very, very low probability events that would release plutonium, and as Ms. Olson points out, there's already plutonium in normal reactor fuel that is built into that fuel as it is irradiated in the reactor.

If those very rare events occur, there are some increases in latent cancer

fatalities, and our own numbers show that, and they're, I think, fairly consistent with Mr. Lyman's.

As someone pointed out in one of our earlier meetings, the fuel that we use in reactors today has very, very few failures. There's almost no failures, so these are extremely low probability events.

As far as the degrading materials, the reactor components, the reactor vessel, and so forth, the utilities, as I understand it -- and you may want to jump in here -- will use a fuel cycle or a fuel -- they will put the MOX fuel in the core in a way that it does not degrade their reactor vessel or materials.

I assume they're going to put the fresh fuel in the center of the core, and as it burns down, they'll move it into the outer regions, but it will be managed at the fuel location. The location of the MOX fuel will be managed in a way that will have minimal impact on the materials and systems in that reactor.

As far as deregulation pressures, you know, I can't speak for the utilities, but I will say that part of our procurement process

was to look for reactors that were financially healthy, that had good operating records with the NRC, and we believe that the Duke reactors and the Virginia Power reactors fit that bill, that they are well run and some of the best reactors that operate in this country today with a very good safety record.

So we feel that this is a safe program, and again, it will be regulated by the Nuclear Regulatory Commission, as will the fuel fabrication plant. We could have regulated that within the Department, but we felt that we wanted to use the Nuclear Regulatory Commission. They're an independent agency. They regulate other fuel fabrication facilities, so we believe that this is a very safe endeavor.

SENATOR LEVENTIS: Thank you. After Mr. Kearse, Dr. Mary Kelly.

MR. KEARSE: I'm Jim Kearse, Barnwell County Council.

How many of these people on this panel to the right are from South Carolina? I'm just curious.

SENATOR LEVENTIS: Mr. Brown is from

Charleston. Ms. Pierce is our research director.

MR. KEARSE: The reason being is, the committee from South Carolina, Barnwell, Aiken, Senator Brad Hutto, Representative McCade -- we went and talked with DOE, Dave, and begged them to bring this process to South Carolina.

What I'm hearing here tonight is some people that doesn't understand what we're going to get from this.

When I was riding up here, I saw a beer can roll across the road, and I thought about the bad things that come out of it. One was death, and the other is split families. Innocent people die, but then there's some good things that come out of them beer cans. You end up with maybe a lawn chair to sit on the beach with after it's recycled.

When you look at plutonium going into MOX fuel, we'll end up with electricity in South Carolina, New York, Washington, wherever. We'll have something coming back to us that we've already paid for. We used it as a weapon of war, and now we're going to use it for peace

times.

All I'm wondering is when we're going to get started. Dave, do you have an answer for that one?

MR. NULTON: Yes, as we touched on very briefly earlier, we are now in the process of initiating design of the fuel fabrication facility. Construction will start in the 2002/2003 time frame and will begin fabricating fuel around the 2006 time frame.

MR. KEARSE: Thank you.

SENATOR LEVENTIS: Dr. Kelly?

After Dr. Kelly, Mr. Lewis Zeller.

DR. KELLY: My name is Mary Kelly, and I have been following these nuclear issues -- I hate to tell you this -- but since before the bombs dropped in Japan.

As a chemist, I have been kind of tuned in, and a lot of what goes on I find deeply troubling.

I am aware of the fact that the nuclear reactors that we now have a finite time frame during which they can operate.

I've seen places where it says -- that had to do with the ability to borrow the

money to build those reactors. However, the other factor involved is the aging of these reactors so that they are no longer safe.

At a recent meeting, I believe it's the one -- there was a recent meeting in Augusta with a subcommittee of the National Science Foundation, and I was able to ask some questions over there.

I was told on this question of -- the reactors are reaching the end of their lives and are slighted to be decommissioned, that they had picked reactors that have as much life in them as they need, and now people are talking about 10 to 12 years over which this MOX fuel is to be burned, but the figure that I was told over that meeting was six years. That's one of the things that I find troubling.

The other one is the question of criticality. We don't often hear anybody talking about criticality, but it is an important issue. We talked about it tonight in terms of the lines from the -- I believe from the tanks.

However, we are assembling a tremendous amount of nuclear material at the

Savannah River Site, and something that kind of lit a light bulb in my head was an article I read in the Wall Street Journal some months ago talking about North Korea.

North Korea, according to the Wall Street Journal, is almost in a situation where they can blackmail the rest of the world because who is going to go in and bomb nuclear facilities? No one in their right mind.

However, we live in a world filled with terrorists and countries that might get the capacity to deliver a missile. What is going to happen if one gets dropped on the Savannah River Site? You know, that is something that does occur to me, so I think there are a great many troubling questions about this whole thing, and we do need some candid evaluations and the belief that we can really trust what we are being told. Thank you.

SENATOR LEVENTIS: Mr. Nulton, I think one of the issues that Dr. Kelly has raised might be invited by saying, are any of the proposed plants that are going to burn the plutonium, the MOX fuel, scheduled to reach their service life end before 2020?

MR. NESBIT: Do you want me to take that, Dave?

MR. NULTON: Go ahead.

MR. NESBIT: We've got six mission reactors proposed for plutonium disposition. Of those, two have licenses which expire before 2020 or in 2020. That's North Anna Unit One in 2018 and North Anna Unit Two in 2020. The McGuire and Catawba Units licenses expire between 2021 and 2025.

We have an irradiation plan for accomplishing the plutonium disposition mission that would accomplish it in the six mission reactors without relying on any extension of that license lifetime beyond the original 40 years.

We've also done evaluations to address aging, specifically on the reactor vessels, which is one of the primary concerns.

As Dave alluded to earlier, when responding to Ms. Olson's question, due to the field management schemes that we use, there's relatively no or close to no impact on the aging of the reactor vessel due to using

mixed-oxide fuel, and we'll be able to demonstrate a large safety margin in that area, so we're not relying on license extension to accomplish the program. However, I will add that at Duke Power we are in the process of applying for and obtaining a license extension for our Oconee reactor in South Carolina. We're very optimistic about getting that license and using that reactor for up to 60 years.

SENATOR LEVENTIS: The security concerns at Savannah River Site, without breaching any security, do they include airborne as well as surface threats?

MR. ANDERSON: (Nodding head.)

MS. CARROLL: Can you put a nod on the record?

SENATOR LEVENTIS: I used to fly over that place in a plane carrying bombs all the time. It was one of ours.

All right. Next is Mr. Louis Zeller. After Mr. Zeller, Ernie Chaput.

MR. ZELLER: Thank you, Senator Leventis. My name is Lou Zeller. I'm on the staff of the Blue Ridge Environmental

Defense League since 1986.

The Blue Ridge Environmental Defense League opposes the use of plutonium fuel in commercial power reactors. The plant's use of mixed-oxide or MOX fuel is unsafe, uneconomical, and unnecessary.

MOX fuel use in reactors operated by Duke Energy and Virginia Power would set a dangerous precedent in the nuclear industry by needlessly exposing many people to the risk of additional radiation exposure from a plutonium fuel power plant accident.

The program is experimental, in that no reactor has ever been operated with fuel derived from weapons-grade plutonium.

I'd read an excerpt from a letter written on May the 17th of 1999 from the advisory committee on reactor safeguards to the chairman of the Nuclear Regulatory Commission.

It states that, quote, The U.S. Department of Energy is proposing to dispose of some fraction of the nation's excess weapons-grade plutonium by converting this plutonium into MOX for use in commercial nuclear power plants. There is, however,

rather limited operational or regulatory experience with the use of MOX in the U.S. Even the experience in other countries is not extensive.

Safety margins will be reduced because reactors designed for uranium fuel will be using plutonium fuel. These are my words. Without modifications of the plant, containment vessel, inspection schedules, and maintenance procedures, the increased danger of a reactor will be hidden by an outwardly normal appearance. It's like a land mine which could go off when least expected.

I want to dwell on just two points here tonight: One is the transportation of plutonium fuel and also issues of reactor safety.

The transportation hazards in emergency response to a rail or a highway accident must be well prepared and rapid. Delays in response to accidents which involve the release of radioactive materials would expose unknown numbers of people to negative health effects.

In 1996, a Department of Energy

Transport and Safeguards Division, Safety-Co transport trailer carrying nuclear weapons slid off a road and rolled over in rural Nebraska.

Four hours elapsed before DOE headquarters were notified, and it was 20 hours before a radiological assistance program team determined there was no release.

A similar delay in response to a MOX fuel accident could make effective emergency response dangerous and cleanup impossible.

The following comment by the Georgia Environmental Protection Division cites, Vehicular tests of materials deposited on roadways, it takes issue with the DOE's approach to emergency response to accidental plutonium fuel releases.

It says, quote, "After a passage of about 100 cars, only a small fraction of the original contamination remained on the road surface. Unless emergency officials promptly closed the accident scene to vehicle traffic, an unlikely situation, emergency responders may face an incident scene that is, unknown to them, extremely hazardous due to respirable plutonium. Post-emergency actions may also be

complicated due to the enhanced spread of contamination by vehicular traffic."

These are the words of the Georgia Environmental Protection Division from their comments to the Department of Energy.

SENATOR LEVENTIS: I appreciate your concerns, and we'd be happy to put anything in the record.

What, I think, would be of more significance this evening would be to pose questions that these gentlemen can respond to because their expertise is available to us, so if we could sort of go in that direction, it would help.

MR. ZELLER: Yes, sir. I understand. In fact, I was just about to get to some questions, which might be to the liking of the representative from Duke Energy and from Cogema with regard to reactor safety.

French test results suggest that plutonium fuel is more unstable than uranium fuel.

In 1997, a MOX fuel rod violently ruptured when subjected to test conditions designed to simulate an accident. The uranium

fuel rod in that same test did not rupture.

Again, the letter from the advisory committee to the chairman of the NRC stated that, We're aware of experimental studies that show there to be enhanced release of fission gasses to the fuel cladding gap during reactor operations with MOX relative to conventional fuels.

We're also aware of anecdotal accounts from the results of Laquores test in France dealing with the release of volatile radionuclides, such as cesium, from MOX under severe accident conditions.

The results of these tests revealed that during the early stages of core degradation, releases of volatile radionuclides from MOX are more extensive than from conventional fuels at similar levels of burnup.

Does anybody care to address those test results?

MR. NESBIT: We're aware of the Capri tests in France. One of the team participants, Electricity to France, is a sponsor of those tests. They happen to be the world's largest user of mixed-oxide fuel. I

believe they have 17 reactors in France now loaded with mixed-oxide fuel and using it.

I make that point to emphasize that this is not an experimental program. It's a mature, proven technology. It's been done safely for years and years.

The performance of mixed-oxide fuel in nuclear reactor cores over decades, primarily in Europe, but also in the United States and Japan, has been comparable to that of uranium fuel.

Concerning the Capri tests specifically, the tests involved nine reactivity insertion accident simulations in a sodium cooled reactor core. The intent of the test was to fail some specimens in order to determine when the specimens would fail.

Six of the tests were uranium fuel. Three were MOX fuel. One of the uranium fuel tests experienced failure, so did one of the mixed-oxide fuel tests.

Our evaluations indicate that the energy deposition rates at which the mixed-oxide fuel failed were significantly in excess of any that could be seen in one of our cores operating from mixed-oxide fuel in the extremely unlikely event that this accident took place in the first place.

All in all, I want to reiterate and point out that the performance of mixed-oxide fuel has years and years of experience behind it in Europe, and it has been exemplary.

If we thought otherwise, Duke Energy would not be involved in the program. We have a tremendous financial investment in these plants. Our workers work there. We live in the plant communities. We'd be crazy to do something that we didn't think was safe.

By the time we'd get to the point of actually irradiating mixed-oxide fuel in our reactors, we will have thoroughly evaluated the entire spectrum of potential accidents that could occur, we will have submitted these evaluations for Nuclear Regulatory Commission review and approval, and they have to give us their specific regulatory approval before we can go forward with the program.

MR. ZELLER: I hope that's some of the concerns of the advisory committee on reactor safeguards regarding the limited

experience of MOX fuel, that you would help provide some information to them, because apparently, they feel that this experience is rather limited.

With regard to reactor safety, once again, at the Catawba plant and the McGuire plant, safety hazards in such plants are a combination of human and technical error. Both types of error are noted in the Nuclear Regulatory Commission's most recent plant performance review of the McGuire, Catawba, and the North Anna reactors.

The NRC's plant performance review, which was completed on March the 25th of 1999 says that, Unit One experienced forced outage of approximately three weeks in duration due to blocked flow channels in portions of the ice condenser, which is part of the containment structure.

Problems in maintenance programs and processes included examples of surveillance deficiencies for ventilation systems and ice condensers.

And the third one is, the engineering performance decline was a result of

deficiencies in auxillary filling ventilation system testing, overheating a vent in the upper surge tank, and degraded conditions in the Unit One ice condenser.

While the issues were ultimately resolved properly, each had its roots in poor engineering performance. These are the words of the Nuclear Regulatory Commission in their review.

The NRC has a mandate to protect public health and safety. The findings from the Cook plant, which uses also ice condensers, indicate that both of its units may not have protected the public had there been an accident.

SENATOR LEVENTIS: Mr. Zeller?

MR. ZELLER: Yes.

SENATOR LEVENTIS: I have to ask you to get to a question. These things that you're pointing out certainly are a matter of record and are important, and we'd be more than happy to hear them. But we really have no access to any kind of resolution of those. If you have a question that you could ask, it really would be helpful.

MR. ZELLER: Sure, the Catawba and McGuire both utilize the ice condensers, which I mentioned, which absorb energy to allow smaller physical containment structures to contain accidental releases from its reactors.

The ice condensers must work in a reactor emergency, similar to an air bag in an automobile. You don't get a second chance.

The Donald Cook plant, like I mentioned, uses similar technology and has been shut down since 1997 because of ice condenser problems. This is a fundamental problem with the containment in the case of an accident within -- in the reactor.

Is it wise to proceed at Catawba or McGuire with the MOX fuel before the ice condenser problems are solved?

MR. NESBIT: The NRC has no regulatory issues with the design or operation of our ice condensers at McGuire and Catawba. That's why our plants are up and running. And yes, we think it is wise to proceed with the mixed-oxide fuel program at McGuire and Catawba.

MR. ZELLER: Well, then, in closing,

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I guess I should add one more point from the advisory committee on reactor safeguards.

She said that public attention has been drawn to the higher actinide inventories available for release for MOX banned from conventional fuels. She states, "Significant releases of actinides during reactor accidents would dominant the accident consequences. Models of actinide release now available to the NRC staff indicate very small releases of actinides from conventional fuels under severe accident conditions." In other words, MOX fuel is more dangerous and will cause more harm to the general public in the case of an accident.

Senator Leventis, I appreciate the opportunity to talk to you today. A total of 3.7 million people live within 50 miles of the McGuire and the Catawba nuclear power stations, and another one and a half-million live within 50 miles of the North Anna reactor, yet the Department of Energy did not see fit to have public hearings in those communities -- but to hold a long hearing in Washington DC on a weekday during working hours. Our written request to the Secretary of Energy for

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additional hearings met with rejection.

The unprecedented veil of secrecy which envelops this civilian project threatens to undermine free debate on important issues of public policy.

Senator Leventis, on behalf of the Blue Ridge Environmental Defense League, I want to express our gratitude to you for holding this public meeting in Columbia, and I appreciate the inquiry to the DOE's plutonium fuel program, which you have initiated. Thank you for the opportunity to address these people today.

SENATOR LEVENTIS: Thank you, Mr. Zeller.

Could you address the notion of public hearings? I know that's been an issue. You all were kind enough to come at my request, but could you go over that just a little bit?

MR. NULTON: We will consider these requests as we get them, but we have set up at this point that there will be a public process related to the license modification that will be required for each of these reactors to burn MOX fuel. That will be conducted by the

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Nuclear Regulatory Commission. And we believe that will provide the public with the opportunity that they need.

SENATOR LEVENTIS: Thank you, Mr. Zeller.

MR. ZELLER: I have additional remarks in writing. I will hand them to the reporter or --

SENATOR LEVENTIS: I think if you will hand them to Ms. Pierce, that will be fine. Thank you.

After Mr. Chaput is Rita Kilpatrick. Mr. Chaput? I hope I pronounce that correctly.

MR. CHAPUT: Thank you, Senator. With a name like Chaput, we answer to almost anything. Thank you, very much.

SENATOR LEVENTIS: Before you begin, I'm looking at about 20 people who would like to speak, and I would like to hear them, and we will stay, but in deference, please see if we can focus on questions that this panel can answer.

MR. CHAPUT: Yes. I do have a statement I'd like to submit. I will skip the statement and just go right to the questions.

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SENATOR LEVENTIS: Thank you.

MR. CHAPUT: I'm with the Economic Development Partnership in Aiken, South Carolina. We've made extensive studies of the activities being conducted and proposed were being conducted at Savannah River Site to make sure it meets the community's expectations with regard to the types of programs that can be conducted safely at that site.

We had an important role in winning the Cold War. We want to have an important role in sort of the next step as the Cold War winds down, as the National Academy says disposing of excess plutonium constitutes a -- you know, that those materials constitute a clear and present danger to national and international security.

We want to have a role, and we think we have the right capability to assist in that important national goal.

If the overall objective is to make 100 metric tons -- 50 in our countries, 50 in Russia -- of weapons-grade plutonium less attractive or ideally unusable for weapons, nuclear weapons, then that can equate to, as I understand the literature, as many as 20,000 nuclear weapons, 20,000 nuclear weapons.

What is the best form for that plutonium to be in? You know, is the form of that material better off as weapons-grade plutonium or reactor-grade plutonium?

I think, as this panel said, you can make a weapon out of reactor-grade plutonium, but which is the better form, whether you're a national state making weapons or a terrorist group who wants to make one weapon? Which is the better form of the material to make that weapon? That's my question.

MR. NULTON: That would be the weapons-grade material.

MR. CHAPUT: As I understand it, there would probably be three reasons for that: Number one, reactor-grade material is more difficult to deal with. Secondly, reactor-grade material is more sensitive and more difficult to make critical. And third, if you have the same amounts of material, you get less of a nuclear yield with weapons-grade plutonium; is that correct?

MR. NULTON: Yes.

MR. CHAPUT: In all three cases.

So you're better off, the world is safer with reactor -- all that plutonium being reactor-grade as opposed to weapons-grade, so what we ought to be doing is reducing the threshold, the attractiveness, and the usability of that material, the ability for people to use it and to make modern weapons, small weapons, reduce the ability to do that by denaturing that material, isotonically altering it and making it reactor-grade plutonium.

My second question is -- I don't know if you specifically addressed it or not, Dave Nulton, but if the -- there is a concern on the part of the Russians, as I understand it, about the U.S. plans for disposition.

If the U.S. goes 100-percent immobilization -- and I think you said you can recover weapons-grade plutonium from the immobilized form; is that correct?

MR. NULTON: Yes.

MR. CHAPUT: If the U.S. goes 100-percent immobilization, will the Russians sign up to this program and dispose of their material?

MR. NULTON: No, they would not, if we go 100-percent immobilization.

MR. CHAPUT: So if we insist on 100-percent immobilization, the program falls apart, none of the material gets dealt with, the world does not -- we don't end up disposing of any of our materials either in this country or in Russia; is that correct?

MR. NULTON: That would be correct, yes.

MR. CHAPUT: I think if we looked at it from the standpoint of what's the right thing to do for our generation and the future generations, let's take the steps that we can take. Take that material. We'll go through a once-through cycle, keep jawboning the Russians, let them -- hopefully they will step away from reprocessing, address some of these other concerns, but the world is better off going MOX than going nothing. And if you insist on total immobilization, you get nothing.

SENATOR LEVENTIS: I think that probably is a question for the administration to ask because they may come back with a

bilateral agreement that might be different than that. We have already heard the Department of Energy say that if the Russians step away from the program, that they will do away with MOX, but we also would have to be under the impression that if the Russians step up to a different program and accept our immobilization, that we would do that, so I don't know that we're going to resolve those issues right here, Mr. Chaput.

MR. CHAPUT: But everything I have heard, that is consistent with the answers I got tonight, is that the Russians will not accept a program where they believe the U.S. government can go back in and surreptitiously take the weapon grade plutonium out of the immobilized form. They don't trust us frankly probably any more than we trust them.

You know, there are hardliners in Russia, just like there are hardliners over here. They want to be assured. They may be looking for some excuse to put their program back.

I guess the important thing is: What are we trying to achieve? We're trying to take as much of this material and reduce it and its potential for application in nuclear weapons to the maximum extent possible. MOX seems to be the only way which that's going to happen. Let's not lose sight of that. For the sake of not necessarily us, but our future generations.

SENATOR LEVENTIS: Thank you.

MR. CHAPUT: Thank you, and here's my statement.

SENATOR LEVENTIS: Thank you very much. Ms. Kilpatrick. Then after her, Ms. Julia Pearson.

MS. KILPATRICK: Yes, good evening, and thank you for this opportunity to ask a couple questions. I will try to make them very brief, but we haven't had an opportunity like this to ask such questions.

I work for and am the director for an organization campaign for Prosperous Georgia. We're an energy consumer based organization.

I wanted to follow up on an issue that the fellow who laid out for us earlier the idea that MOX may significantly boost the

energy supply to South Carolina -- I want to better understand what actually is estimated to be the amount of electricity in terms of capacity and demand that Duke Power, for example, would expect to generate from MOX fuel, and what is that in comparison to your total capacity demand per year?

MR. NESBIT: Okay, our system is approximately 60-percent nuclear right now, of which about two-thirds of which would be Catawba and McGuire, so about the time the program would be in place, we would be generating, depending on electricity demand, growth, et cetera, at the time the program were to start, maybe 30 to 40 percent of our electricity from units that have some mixed-oxide fuel in the cores.

I'd like to point out that in the case of Catawba, Duke is a 12-1/2 percent owner in that plant, and that the remainder of the plant is owned by four municipalities and co-ops that were not the complete owner of that plant. The electricity actually goes to other organizations.

MS. KILPATRICK: Do you know the

actual electricity output that the MOX itself would generate?

MR. NESBIT: It would be approximately 1,050 megawatts per unit, so if all four units are operating, that's on the order of 4,000 megawatts of electricity.

SENATOR LEVENTIS: But wouldn't it be fair to say that it's no different than they're doing now, or that they would do subsequent to --

MR. NESBIT: Yes, sir, absolutely. Those units will be operating irrespective of whether this program is in place or not.

SENATOR LEVENTIS: Is it your question, is it going to be a greater output?

MS. KILPATRICK: That's my question. What contribution does it actually have?

MR. NESBIT: Oh, the power generated by the station will not change.

MS. KILPATRICK: All right, that's what I had understood, and I just wanted to make sure I had the right understanding.

Another question has to do with polling. I know I asked you at the break time, and you didn't know the answer to the question

of whether Duke Power has done any customer polling.

It's occurring more frequently now across the country where utilities are concerned when they face deregulation what their customers would choose in the way of a utility provider, fuel types, or concern in environmental impacts, cost impacts, et cetera.

I don't know if there's anyone from Duke Power here in the audience who might be able to speak to whether the company has carried out any polling of its customers to determine if any customers are showing a real strong interest in purchasing electricity generated by plutonium based MOX.

MR. NESBIT: As I indicated, I'm unaware of any such polling, but I can't guarantee that it hasn't taken place.

MS. KILPATRICK: Do you have anything to offer along those lines, either for Virginia Power, Duke Power customers? The polling information that we have is showing what we're understanding to be fairly consistent results, that when given a preference, the majority of consumers are indicating that they would prefer to buy energy that is drawn from renewable energy, energy conservation sources, rather than fossil fuels and certainly more than nuclear power.

So is there a -- what we would like to have a sense of is whether there's been any customer demand assessment polling done yet; or if not, is that anticipated in your plans?

MR. NULTON: I'm not aware of any polling that's been done. Utilities certainly know, and I don't know if they intend to do it.

MR. NESBIT: I don't think there has been. I can check and get back with you, Senator.

SENATOR LEVENTIS: In that regard, not Duke, but DOE -- Dave, I know that the Department of Energy gave a fairly substantial grant to the medical university to look into the matter of our acceptance of nuclear waste in the state.

So if you would -- it may be a part of the agency that looks into the those things, please let us know, and we can let Ms. Kilpatrick know.

Next would be Ms. Julia Pearson, and

after her Mr. Kawaguchi.

MS. PEARSON: My question was already answered, if you'd like to go ahead.

SENATOR LEVENTIS: Thank you very much. In that case, Tomo. Then after him, Mr. Bob Guild.

Please pronounce your name correctly, and accept my apologies.

MR. KAWAGUCHI: Good evening. My name is Tomo Kawaguchi. I'm just a concerned citizen, also. I'm a marine biologist.

My first question is I think an issue of credibility of DOE. I recently read a newspaper article on waste treatment facility at the SRS, 500 million dollar total facility have failed, but basically I still haven't digested sort of the article itself.

In other words, that's lots of money, and so many people could have been hired by this money, but I guess we are not ready to sort of proceed a new project, I think. I think we still need a lot of time to really digest this sort of particular incident, because SRS is particularly designed for containment of those wastes, nuclear wastes.

I've seen almost -- first time that radioactive fish, contaminated fish in Savannah River, so I think -- can we really trust the DOE to do this project? That's the first question.

The second question is: If this project is to start, are we -- in Columbia, are we getting plutonium contaminated clothes at INS located South of Edisto Avenue? That's second question.

And I guess the last question is the security issue. I think the U.S. taking dual position that -- one is immobilization, and the other one is this MOX fuel issue, MOX fuel, but I think you said that if one of them failed, you can choose one of them. But if the MOX fuel failed means not only the safety -- I mean, environmental safety, but also if terrorists gets this, it is sort of the end of the world in my concern.

So I think transporting this MOX fuel into three different locations to me means triple the sort of safety concern and the danger, so I think we really need to go slow on that, and so those are three sort of my

concerns, and also the questions I'd like to know.

SENATOR LEVENTIS: Thank you very much. The question of proceeding, question of waste, especially as it applies to us here, and then the question of security and transport after it's MOX.

MR. NULTON: The first question -- can you trust DOE, well, I think you can. I certainly hope that you can.

Again, the Nuclear Regulatory Commission will license and regulate both the fuel fabrication facility and the reactors that will irradiate the MOX fuel.

Secondly, can you expect plutonium contamination. I don't think there will be any plutonium contamination, any measurable plutonium contamination from these facilities.

Thirdly, terrorists have not -- are more of a concern, I think, in Russia than in this country, but I think to the extent that terrorism is a concern, it's going to be a concern for both immobilization and MOX.

There's transportation associated with each of these technologies in getting the materials from their current location to the Savannah River Site, where this work will be done.

It is true that there will be the additional transportation of the fuel that is fabricated at Savannah River to the reactor site.

At that point, the plutonium is mixed with uranium. It's then pressed into pellets. Those pellets have been centered. They're in beveled tubes. The tubes are in fuel assemblies. The fuel assemblies are in a cast. The cast is in an SST truck. The chance for any diversion of material at that point is extremely remote.

I also want to say -- and this may respond to an earlier comment that was made -- that all transportation of materials will be conducted in the department safe, secure transport trailers.

And as Mr. Zeller pointed out, there was a situation in Nebraska where a truck went off the road, but these are extremely rare situations. In over 94 million miles of transportation of materials around the country,

in many cases, perhaps most cases, transporting the weapons that the Senator mentioned were on his plane, we have had no release of radioactive materials.

These materials are transported in containers that are very, very robust. They go through a number of tests, fire. They're put in very hot temperatures, where they're dropped from pipes onto concrete pads, slammed into walls. They're put under water at high pressure. They are designed not to break open under even extraordinary circumstances. Then they are put into these SST trucks.

So we believe that the transportation of these materials is very safe.

SENATOR LEVENTIS: Thank you.

Bob Guild and then Mr. Peter Sipp.

MR. GUILD: Thanks, Senator. I very much appreciate, as do all of us, your willingness to invite the Department and others to address these important issues.

I would note that the Department would not be here had it not been for your request, despite the fact that the public has been clamoring for some time that DOE come to

communities most directly affected by this proposed program and address the public's concerns. So thank you, again, Senator.

I want to just state unequivocally -- Bob Guild is my name. I'm an environmental lawyer. I was involved in the licensing proceeding for the Catawba reactor, so I have some familiarity with some of the quirkiness of their designs, as referred to by Mr. Zeller earlier. I share his concerns.

I wanted just to state that my view is that the government should be pursuing with full zeal the immobilization program exclusively.

I think it's just outrageous to suggest that the Russians are dictating terms of the program we're going to follow, particularly since we're paying the bill for whatever program they choose to adopt.

It seems to me we have all the cards here, and it's absolutely outrageous to suggest that somehow we're driven to a second best program, a program that involves experimentation and undue environmental risk because the Russians insist on it, so I

encourage us to forget that notion that we have no choice in the matter and negotiate more toughly with the Russians until we come up with a program that involves the minimal handling of this material, the minimal processing of this material, the minimal plumbing, the minimal dilution with the aqueous solutions or acid solutions, the minimal opportunities for environmental release, instead of the maximum exposure of the public, maximum handling, the maximum opportunities for diversion and environmental risk, which is the MOX program.

I frankly am just absolutely astounded that it takes a democratic administration with an environmental vice-president for us to embark on this idiocy.

It takes Duke Power Company to volunteer to step up to invite the public to wonder what on earth are they doing inviting mixed-oxide fuel to power their commercial reactors which are in trouble enough.

Now, I heard the discussion about beyond design base accidents, and I read with interest the supplement to your Environmental Impact Statement that finally gets around to even touching on the subject of reactor accident risks, and does so in my judgment wholly inadequately.

But will the gentleman from Duke and DOE acknowledge, as I understand the case to be, that the people of Charlotte, North Carolina because they are surrounded by four ice condenser units, McGuire at Lake Norman 17 miles north of downtown Charlotte, and Catawba on Lake Wylie in South Carolina 17 miles south -- the people of downtown Charlotte are exposed to a higher risk of the beyond design basis accident fatalities than any other community in the entire United States.

Am I accurately recalling what either the reactor safety say or the NRC's comparative assessment of relative risk of people in reactor communities have concluded with respect to the people of Charlotte? Does anyone want to address that?

MR. NESBIT: Yes, I think your conclusion is an error.

The reactors at McGuire and Catawba meet a series of very strict regulatory

standards that are imposed by the Nuclear Regulatory Commission.

We showed the NRC that we met those standards when we got them licensed back in the early 1980s, and they've operated safely ever since then.

In addition, in the mid 1980s, the Nuclear Regulatory Commission promulgated safety goals for nuclear power plants.

To summarize the goals briefly, those goals were that the risk to someone in the population surrounding the plant of a prompt fatality should be no greater than half of 1 percent of the overall risk of such fatalities.

In addition, the risk of cancer fatalities from the nuclear power plant operation should, again, be no greater than half of 1 percent of the overall risk of cancer fatalities. The NRC --

MR. GUILD: I don't think --

MR. NESBIT: Excuse me. Could I complete my question?

MR. GUILD: I don't think you're responding to my question. If I could simply

restate the point.

Of the communities in the United States, is it not the case that the people of Charlotte face the greatest risk of death from beyond design basis accidents; and if they don't, what ranking is Charlotte? Is Charlotte number two, number three, number four, or is it indeed number one as I recall reading? That's the question I have for you, sir, not a soliloquy about how safe Catawba reactors are.

Relatively speaking, where does Charlotte stand with respect to the risk of fatalities from a beyond design basis accident?

SENATOR LEVENTIS: There's nothing inconsistent with what either one of you are saying, because I doubt seriously if there's a major metropolitan area with two reactors on the north and two reactors on the south so positioned.

Bob, what you're saying has to be probably correct if that's true, and the fact that it's highly unlikely probably is correct, as well, but from a statistical standpoint, are there millions of people so located in relation

to four reactors anywhere else?

MR. NESBIT: Sir, I've not done the demographical studies to respond to that question, but I'd just like to complete my statement and say that --

SENATOR LEVENTIS: Sure.

MR. NESBIT: -- the NRC's own studies indicate that the risks from operations at Catawba and McGuire are one to two orders of magnitude lower than the NRC's own safety goal, with or without MOX fuel.

SENATOR LEVENTIS: But the question then becomes: Did the NRC have a probability of accidents among the reactors in the old Soviet Union? What was our take on that, and were we surprised when Chernoble went boom?

MR. NESBIT: I don't think the NRC studies at that time even considered the different Soviet designed reactors.

SENATOR LEVENTIS: Did they, Dave?

MR. NULTON: I don't know. But let me just say that the Chernoble reactors are a different design than the VVR1000 reactors that are the seven that I mentioned.

SENATOR LEVENTIS: I understand

that. The point is: Did the NRC or DOE try to quantify what they thought were the probabilities of those reactors with those designs having a problem, and did this meet our expectation in terms of the incident and its intensity?

Those are valid questions because if the DOE, NRC, whomever, applied the same logic to the different technology and came up with a probability, and then there was an occurrence, then it would be useful to apply that same rationale to ours.

Nobody wants a problem. Everybody works to avoid a problem, but these are highly complex kind of things, so we have to do some kind of statistical approach to see where we ought to be applying a little more paint or glue or whatever it is that we're going to do.

But like I say, I don't think there's a difference of opinion. It's just the difference that you're looking at those particular things.

So can we move on to another question?

MR. GUILD: Well, of course, the

3-mile Island accident was a beyond design basis accident, as well. The loss of coolant circumstance of TMI was not contemplated in the design of that reactor, nor was it contemplated in the design of the Catawba reactors.

Ice condensers, of course, address only the possibility of a steam explosion and the condensing of that steam. They don't address the concern of a hydrogen buildup in the containment for which Duke Power had to jerry-rig a glow plug design with the hopeful intention that the buildup of hydrogen would be burned off in a controlled burn as opposed to an uncontrolled explosion that would result in loss of containment.

Your supplement to the Environmental Impact Statement for this proposed program, page K24, addresses these beyond design basis accidents and, as the previous speaker alluded to, acknowledges that for a mixed-oxide, MOX, core there will be some 15,600 prompt and latent cancer fatalities projected from the operation of the Catawba reactor. In the event of a beyond design basis accident, 15,560 -- 15,600, excuse me, prompt fatalities in latent

cancers, as compared to 14,000.

That's an acknowledgment of an excess of 1,600 prompt and latent fatalities associated with a beyond design basis accident at Catawba. That's according to the DOE's own study, associated with the choice by DOE and Duke to subject us to this increased risk for mixed-oxide fuel.

Now, President Clinton adopted an environmental justice Executive Order where, as part of the compliance process with the National Environmental Policy Act, he required government agencies, such as DOE, to assess whether or not actions you proposed to take will embody a disproportionate and adverse impact potentially on minority communities and communities with low income.

And you purport to do such an analysis that I find will be inadequate at Appendix M to your supplement to the EIS. And there you simply conclude that since there will be no bad impacts on anybody, there won't be many bad impacts on people of color or people of low income.

My question for you, sir, is:

Having concluded that there will be an additional 1,600 fatalities in the event of a beyond design basis accident at Catawba, what analysis have you made of a population that will suffer those fatalities with respect to environmental justice considerations?

In other words, the people who will die of the 15,600, what proportion of they are persons of color and low income in downtown Charlotte, and how does that square with the President's Executive Order on environmental justice, and how are you going to address that in the thus far inadequate E.J. Appendix to your Environmental Impact Statement?

May I have an answer from DOE, please?

MS. WHERLEY: I know that the demographics were reviewed around the sites, and I know that that conclusion that you quoted, I believe, stated -- the conclusion was made with the concept of probability of the accident taking into account. There was no intention to say that any of those cancer fatalities were an insignificant impact.

MR. GUILD: I'm sorry. I missed the

last part.
MS. WHERLEY: There was no intention for there to be any implication that any of the latent cancer fatalities was considered an insignificant impact.
MR. GUILD: Your environmental justice analysis simply looks at the proportion of a population within 50 miles that meet the description of being minority or low income.
But of course, that's not the same population that will suffer the immediate fatalities or latent cancer facilities in the event of a beyond design basis accident because that population is in the plume exposure pathway. They're the ones that are going to get the airborne release fission products.
My question for you is: Who in that plume exposure pathway meets the requirements under the President's environmental justice Executive Order of being low income and minority, what proportion, and will they be disproportionately impacted?
MR. STEVENSON: That certainly was taken into consideration because the guidelines that are given to us when we do environmental

justice studies do include a requirement for plume studies.
So when that conclusion was reached, it did, in fact, take into consideration wind directions. There are certain wind roses to be used so that we can determine what are the most common directions of the wind as a function of time of year, and all of that supporting data is used in order to achieve the conclusion to which we have.
MR. GUILD: Well, I'd ask you to look at page M6 of your supplement, and I'd suggest to you that there's no such breakdown whatsoever in your environmental justice appendix. It's simply a gross characterization of the 50-mile radius, and no effort to focus a wind rose or to determine a plume exposure pathway.
If I'm mistaken, after the record is closed, I'd be pleased to be corrected, but I read it carefully.
MR. NULTON: We'll take just a minute to go back and look at that section, put more information in there.
MR. GUILD: I'd appreciate that.

MR. STEVENSON: Certainly, we wanted to make sure that you understand that a great deal of data and analysis went into making sure that that was a correct and accurate statement.
MR. GUILD: Well, that analysis is not reflected in the text of your appendix, I might note, a couple of specific questions, please.
Once the MOX fabrication facility at Savannah River, if it ever is to take place, is -- finishes its useful life for this program, is there a current plan for its disposition or future use? And what is the risk that you will find the Department of Energy producing commercial mixed-oxide fuel for the commercial nuclear power industry after they've done their national plutonium disposition duty?
MR. NULTON: We have indicated from the beginning of the program that this would be a single mission facility.
The contract with DCS requires them to deactivate the facility at the end of their mission. It then reverts back to the Department. We will do the R&D on that

facility, the decontamination and the decommissioning.
At that point, a determination will be made whether to tear the facility down or use it for some other mission. There is no chance that it will be used for commercial fabrication of mixed-oxide fuel --
MR. GUILD: I'm sorry. What other missions might those be?
MR. NULTON: Well, at the Savannah River Site, at that point in time, will be cleanup missions, so it might have some role in some site cleanup activity.
MR. GUILD: Once mixed-oxide fuel has been irradiated in the reactors, if it ever is, the Catawba reactors, McGuire, North Anna, must it be managed any differently than uranium based fuel? Will it be for any period of time stored in on-site fuel storage facilities at the subject reactors? Is there a capacity in those pools if such a requirement is needed? Is there a need for modifying on-site storage to manage those assemblies once they leave the reactor?
MR. NESBIT: That's a series of

questions. Let me make sure I try to get them all.

MR. GUILD: Sure.

MR. NESBIT: The plans are to manage the mixed-oxide fuel similar to the way that we'll manage the uranium fuel.

Depending on what's going on with the overall spent fuel program at the time the mixed-oxide fuel is discharged, initially -- well, we would treat the mixed-oxide fuel the same as the uranium fuel initially. It will go into the pool.

The fuel stays in the pool for some number of years. If there's a shortage of pool capacity, then what we would do is eventually discharge the fuel from the pool into dry storage on-site. We're in the process of developing such a facility at McGuire. We've already developed such a facility at Oconee.

Our plans for mixed-oxide fuel are essentially to keep it in the pool. The mixed-oxide fuel long-term decay heat is higher at a given point in time than uranium fuel, so therefore, in order to put it in dry storage, we'd have to let it cool longer anyway, but our

anticipation is just to keep it in the pool until we can ship it off-site.

MR. GUILD: Just to be clear, so if you needed extra space, you'd simply take out uranium based assemblies and dry-store them on-site to make room for the mixed-oxide assemblies. Is that what you're saying?

MR. NESBIT: That's correct. I should add that, during the course of the program, there's not a substantial increase in the number of total discharge fuel assemblies. There's a slight increase in the number of discharge fuel assemblies, so the generation of spent fuel is essentially the same with and without MOX fuel.

MR. GUILD: Do the mixed-oxide assemblies, spent assemblies, require any greater amount of storage space in the pools? Do they pose additional criticality issues than the uranium?

MR. NESBIT: We don't see any at this time, but that's one of the system studies that we will be performing over the next few years as part of our DOE based contract, and we'll establish what limitations we need to in

order to ensure safe storage of the spent fuel assemblies.

MR. GUILD: I heard a gentleman from DOE speak to transportation of the fuel prior to irradiation of mixed-oxide fuel. I understood that -- one of my questions was answered. You will be using your DOE -- I think you called it your SST's.

MR. NULTON: Yes.

MR. GUILD: Not supersonic transport.

These are the arm-guarded DOE transport vehicles that carry weapons material. Is that basically the case?

MR. NULTON: Yes.

MR. GUILD: I mean, I just want to make a point to you that I was a participant in a transportation monitoring project some years ago, and I must tell you, I met one of these trucks, these SST's, at a steakhouse at the intersection of Interstate-20 and Interstate-26, and I followed it off the interstate, pulled into the parking lot, and watched while the crew all went in and had steaks for an hour and a half, and the truck

with presumably nuclear weapons material -- the guys who were guarding it sure looked like they were on the job -- these guys took turns going and eating steak for an hour and a half while the truck sat in a parking lot at a public steakhouse within the city limits of Columbia, South Carolina.

So I'm a little concerned and not particularly comforted to hear that it will be the Department of Energy, the SST trucks, that are going to be hauling this stuff up and down the highways.

That's not a question. That's just an observation. You answered the question earlier. Thank you.

SENATOR LEVENTIS: Do you know how much longer you're going to be?

MR. GUILD: I have one more question.

SENATOR LEVENTIS: We're going to take a break and allow Ms. Jeter some time to get her thoughts together.

Everyone has been more than considerate, and we're going to stay until everyone who would like to say something does

and is allowed to, but go ahead.
MR. GUILD: I'll finish mine. Thank you very much, Senator.
The last question I have is: The Price-Anderson Act insulates commercial nuclear utilities from -- for the exposure to liability for the consequences of your commercial activity.
If someone is killed as a result of a radiation accident at the Catawba Nuclear Station, one of those 15,600 people in the hypothetical beyond design basis accident, they literally have no right to sue Duke Power Company because the Price-Anderson Act that you successfully defended before the Supreme Court insulates you from liability.
The question is: Will receipt of mixed-oxide fuel at the Catawba and McGuire reactors require any change in the Price-Anderson Act? Will the Price-Anderson Act give you -- will it extend your insulation from liability for the marginal 1,600 additional deaths that are projected to occur if there were a beyond design basis accident? Are you going to need additional liability

insurance, Mr. Duke Power Company?
SENATOR LEVENTIS: Do you know the answer to that about the Price-Anderson Act?
MR. NESBIT: I'm not an expert in that area, but I think that -- the way it was characterized may not be entirely accurate.
The Price-Anderson Act, as I understand it, puts a limitation on liability. It does not insulate us completely from liability.
We are required to hold nuclear insurance up to close to a billion dollars, I believe, which we do. We've had informal discussions with our insurers, and they've seen no need to increase our insurance premiums in the event that we transition to a different fuel source that's MOX fuel instead of uranium fuel.
SENATOR LEVENTIS: Would you, for us, submit that question to the folks who may know about whether or not the Price-Anderson Act would require any modification to --
MR. NULTON: It does not.
MR. NESBIT: Does not.
SENATOR LEVENTIS: All right.

MR. GUILD: Again, I appreciate your indulgence in answering my questions. And I just would encourage DOE to really rethink this program. I think it's wholly misguided, and I appreciate very much that you are now answering some of our questions about this. Thank you.
SENATOR LEVENTIS: We'll take a break and try to be a little bit more prompt and try to reconvene at a quarter after.
(A recess transpired.)
SENATOR LEVENTIS: I'd like to call Mr. Sipp, please, Peter Sipp.
MR. SIPP: Thank you. Thank you. I'll make my questions real simple, because simple is best.
What I want to know is, what is it going to cost to build this plant, the MOX plant?
MR. SELBY: The estimate right now for the construction is approximately 450, 480 million dollars.
MR. SIPP: Uh-huh. Okay. And the next question is: What would it cost to build the immobilization plant?
MR. NULTON: It's about the same

amount of money. Although, that's changing because of an increase in facility size that's recently been projected.
SENATOR LEVENTIS: Increased or --
MR. NULTON: Increased. So the price is increasing on the immobilization facility right now, but it's on the order of 500 million dollars.
MR. SIPP: So approximately the same?
MR. NULTON: Approximately the same, yes.
MR. SIPP: Okay. So then the plutonium, it will still be waste -- it will still be nuclear waste after it's been through a reactor?
MR. NULTON: Yes. On both cases, the waste form that's produced will go to a geological repository as high-level waste. From the MOX program, it will go in the form of spent reactor fuel. And in the case of the immobilization program, it will go in these large waste canisters with the plutonium imbedded in the glass waste.
MR. SIPP: Yeah. That's simple

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enough to understand.
The fourth -- I don't really have a question. It's really more of a comment. I was considering investing in Duke Power; but being that you're looking at it like this, I'm not going to.
SENATOR LEVENTIS: Thank you, Mr. Sipp.
Patricia McCracken. Then after that, Jimmy Mackey.
MS. MCCRACKEN: Hi. I want to put on the record that at each meeting I go to, I'm looking for a comprehensive transportation plan that I have failed to find at any of the libraries, and underneath it, I believe that would be required.
I didn't get a handout. I don't know if I came in late. It was kind of crowded.
The person from Cogema -- I don't have your name, sir -- could you tell me if you have given the DOE the 20-percent ownership of all the people who have ownership in your company?
SENATOR LEVENTIS: They have.

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MS. MCCRACKEN: If 80-percent is owned by the French, who owns the other 20 percent?
MR. HUGELMANN: A French oil company, Total, a French oil company.
MS. MCCRACKEN: A French oil company. I have a little trouble. By the way, I've not been able to understand you real well. I have a real bad southern accent. So you may want to have an interpreter here at the public hearings.
Can you tell me the name of the French oil company?
MR. HUGELMANN: Yes. The name is Total, T-o-t-a-l.
MS. MCCRACKEN: Okay. And I am glad -- you know, I feel like we could be standing here with just the Russians and the French. Thank you, Duke Power, for being here.
What really concerns me, after reading all these documents, is all the things we have done for the nuclear industry. We give them a dump. We subsidize them. We do research and development. They don't appear at the meetings. They don't visit Yucca Mountain.

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They're sitting there just, Okay. They have turned their backs. We've gone to the French. I'm totally embarrassed.
I think that these companies should have come forward with at least an advisory board. I think only 12 people made the decision to do this contract. I just think it's a total embarrassment that the American people knew and their customers knew that they had not participated any better in offering the expertise -- I guess that Duke Power has spent some money to do some expertise, to do some research, to work with our government. It is a total embarrassment to have to come here. I want to go in the back and sing America the Beautiful.
Again, I mentioned the transportation plan. I will give the rest of my comments, you know, at the -- I assume we can send in written comments.
SENATOR LEVENTIS: Well, the written comment period for input is to close when?
MR. NULTON: June 28th, but we will take comments as long as we get them and can still incorporate them into the document.

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We've always taken comments up to the point where we basically be able to print on the document.
MS. MCCRACKEN: I don't know who gives out invitations, but I've been put on every list to come to the meetings. I have called Mr. Nulton's office. I called today just to find out what was going to be going on at the meeting. I couldn't get a list of documents. There was no handouts for the meeting.
I think under such a serious subject matter, that we should at least have some handouts so we can follow along the discussions, you know, of the group, you know, that's here, so that we can address the panel and know the names of the people.
SENATOR LEVENTIS: How did you find out about the meeting?
MS. MCCRACKEN: I saw it in the Augusta Chronicle, because I did not get on a mailing list, of which I have requested, you know, many, many times. Even I called a 1-800 number.
And I appreciate you having, you

know, the meetings, so that we do have an opportunity to come.

One more quick question. When you're doing the MOX fuel facility, what kind of energy will be used to run the facility?

MR. SELBY: Standard electricity. There will be some gas.

MS. MCCRACKEN: I mean, does it use a lot of energy to run this -- to do all these processes?

MR. SELBY: I believe the estimate is around, for the total -- do you remember what it is in -- we've estimated it at around -- I think, total energy cost around 5 million dollars, maybe.

MR. HUGELMANN: I can give you an answer on that. This is not a very analytical process. This is only electricity mainly for the machines, for the equipments, electricity for the venting system, for depression type -- this is not analytical process. This is very small concentration (inaudible).

MS. MCCRACKEN: Oh, okay. In your country -- you know, DOE meets with like military people. Do you have like clearances

and meet with like military people in your country like we do here? You know, you're owned by the government. Do you meet with military people?

MR. HUGELMAN: The people who have jobs in the MOX plant and reprocessing plant are all civilian people. We don't meet military people.

MS. MCCRACKEN: Okay. But you don't meet with your government military people in any way? Like your plant doesn't deal with, like here, weapons things?

MR. HUGELMANN: In France military -- (inaudible) military question is inside a specific organization, but Cogema is only for the civilian use of nuclear energy. It is only civilian used.

MS. MCCRACKEN: Oh, okay. I'm not sure I understood all of that.

MR. NULTON: What he was saying is, it's a civilian facility for civilian purposes, no military purpose.

MS. MCCRACKEN: No. I mean, is he like on an advisory board that meets with military in any way? You know, are you like

the leading -- obviously, if you are owned by the government, you do most of the nuclear things. Do you sit on any boards or meet with military people on panels or any, you know, like boards, advisory boards?

MR. HUGELMANN: No. This is fully separated in France. Military use of nuclear energy and civilian use of nuclear energy, fully separated.

MS. MCCRACKEN: Oh, okay. Because, you know, like here in this country, this started out as a domestic program to take care of domestic waste. It's kind of expanded beyond what I think anybody ever reasoned in looking at why we establish something to help our, you know, American companies.

It's a little disturbing to see how far reaching -- what started out to be a repository has now expanded, you know, without more participation of our American nuclear industry.

Thank you for the opportunity.

SENATOR LEVENTIS: Thank you very much. Mr. Mackey? Then after him, Glenn Carroll.

SPEAKER: Mr. Mackey went back earlier.

SENATOR LEVENTIS: Okay. I'm sorry that we weren't able to get to him. Glenn Carroll, and then Joan King.

MS. CARROLL: Is this the microphone?

SENATOR LEVENTIS: Yes.

MS. CARROLL: My name is Glenn Carroll. I'm from Atlanta, Georgia. I'm representing GANE, Georgians Against Nuclear Energy, an all-volunteer group.

GANE applauds the disarmament efforts in the United States and Russia, which has brought us to the problem of what to do with unnecessary plutonium.

We thank you, Senator Leventis, for bringing us together tonight.

Plutonium has become nuclear waste. Plutonium is unacceptable as reactor fuel for many reasons, but we emphasize that plutonium for MOX fuel is a dangerous experiment, messy to make, and risky in a reactor.

There are environmental hazards attendant to transporting and dismantling nuclear warheads and in subsequent immobilization and storage, even temporary, of retired plutonium triggers, as well.

But the work force at Savannah River Site has the talent and needed experience for the honorable mission to immobilize plutonium, and we offer wholehearted support and encouragement for them in that activity.

I've heard some things tonight that have made me concerned about the potential of mining immobilized plutonium, which makes me think let's do this technology right. It shouldn't be minable. If we're going to immobilize plutonium, then we have to make it so it can't be mined.

But we support taking the plutonium out of the market. We do not support MOX.

We understand the allure the MOX project holds for the SRS community. It presents a lofty technical challenge and would provide many jobs.

GANE points out that many, many skilled, experienced people are also needed to deal with contamination to the environment and the huge legacy of nuclear waste left from the

50-year Cold War.

SRS work force has the appropriate experience and facilities to contribute in the humane fields of environmental restoration and nuclear waste containment.

We support the plutonium immobilization effort; but in light of recent experience with intank precipitation, we urge that we perfect the technology at a pilot level first.

We are calling on Congress to direct funding away from the wasteful, harmful MOX project and give it to projects that support people and the environment we depend on for life and health.

Georgia shares the risks and benefits of the Savannah River Site's location on our boarder. We ask the South Carolina legislature to work to protect our people and ecology and to help educate your peers in Congress.

We have at long last the most welcome opportunity, jobs for a community that has long proven its patriotism, jobs that promote peace and environmental health for us

and for future generations.

This has been a really provocative event, and I cannot thank you enough for holding it. It's been very different from the type of hearings I came prepared to address. And I do have a couple of questions.

You say that it's not going to be the RBMK trinoble type reactor that will be used. Did you say it was TVRI?

MR. NULTON: VVER1000.

MS. CARROLL: Do they have containment?

MR. NULTON: Yes.

MS. CARROLL: Is it square buildings or pressure domes?

MR. NULTON: Dome containment.

MS. CARROLL: That problem with the safe secure transport in Nebraska, was that the one that happened during the blizzard?

MR. NULTON: I believe it was. It slid off the highway, I think, into a ditch on the side of the road.

MS. CARROLL: Well, our Georgia Environmental Radiation manager was the one that told me about that accident, and he was

concerned about transportation on Georgia's highways of these materials.

And one of the things he raised, and something he's working on, and I'd like to add GANE's voice to this is that, the significant problem there was that there was no trained personnel present with the shipment to measure the radiation.

So once the accident happened, the call went out, Come here, we don't even know if we've released radiation yet.

And we think that you've got to -- I mean, we understand that to deal with this problem we're going to have to transport stuff, but we have got to have trained personnel riding with the shipments.

Can you speak to that? Were you aware of that?

MR. STEVENSON: My information is incomplete on that, and what we can do is certainly get back to you with that.

Yes, I have heard that on certain trips the radiation detection gear was not on the trailers, because it was not required. Okay. That has been reassessed.

What I'm not familiar with is the results of that reassessment, but we can provide you with that.

MS. CARROLL: Well, we just want to make sure that every single shipment has trained radiation personnel traveling with it.

If Russia doesn't comply with our agreement and they pursue a breeder program, what are we going to do about it?

MR. NULTON: Well, the Russians at this point don't have the funding to pursue a breeder program, but --

MS. CARROLL: Well, if they redirect our funds and pursue a breeder program, what are we going to do?

MR. NULTON: Well, our funds will be provided in incremental fashions. So if they -- I mean, we're not going to give them all the money up front and watch what happens.

So the funds will be provided as they complete elements of work. The work we're doing with the Russians right now, they get paid after they do the work, not before.

MS. CARROLL: Okay. They trust us to reimburse them. That's interesting.

MR. NULTON: We get to see what we're paying for before we pay for it.

MS. CARROLL: I need to make an observation. All night long, there's been emphasis that the ratepayers will not take the hit -- if the expenses are unpredictable, the ratepayers' rates won't go up. And I wanted to say out loud on the record -- we all know this, but let's think about this for a minute. When the department shells out the money, that's us, that's our taxes. The department has no other source of income than us, the taxpayers.

MR. NULTON: Let me just say that any of these programs are requiring money from the taxpayers; and continuing to store the material and doing nothing requires a great deal of money. You have to pay for the buildings. You have to pay for the security around those buildings.

In fact, over the long hall, that's probably the most expensive alternative, because you never get rid of it, and you're going to be guarding it to the end of time.

So we realize that it costs money no matter what we do, and it's all taxpayers'

money.

MS. CARROLL: Well, the MOX program ultimately leaves the legacy that it will be guarded forever. So I see it as a very circuitous path that does not take us to the goal, but takes a lot of money that diverts effort.

And another interesting point that was just brought up -- and I do want a specific answer -- how many watts of energy will the MOX fabrication plant use?

MR. NULTON: We don't have that number off the top of our head. Mr. Hugelman here was saying that -- it's in the EIS. I just don't have it off the top of my head.

MS. CARROLL: Well, you have an EIS handy, don't you?

MR. NULTON: Not with us here, no.

MS. CARROLL: You're kidding? Well, I just remember when TDA wanted to finish the Belfont plant in Northern Alabama, they needed an excuse, somebody to use the excess power that would be generated. And they said, Oh, well, we're going to build a uranium enrichment facility here. It would use half the power we

generate.

I'm sure it's a very power-intensive process. So while we have the benefit of generating electricity from it, we will gobble a lot of electricity to do that. So it's --

MR. NULTON: Again, the immobilization facility also requires electricity to fire up melters and things of that nature.

MS. CARROLL: Good. We need to take this plutonium out of harm's way, if we have to refine the technology, if it's minable in the path we're pursuing, we can't go down that path until we figure this out.

I'm not technical. I'm an artist, and Arjun could probably help you design what you need. Could you do that, Arjun?

(Laughter.)

MS. CARROLL: For a price? I'm sorry. I don't mean to put you on the spot.

DR. MAKHIJANI: I appreciate it.

MS. CARROLL: All right. Well, I think the most important question that I'd like to know -- I'd like to make an observation on something else I heard you say, because I'm in

Georgia, and the legacy from Jimmy Carter through every governor since has been, we are very concerned about activities over at Savannah River Site. And the policy has been, at the highest office in Georgia, that until cleanup occurs, no new facilities, no new missions. Cleanup of the environment, containment of the environment is the only thing that we will support.

And you made the comment, Well, what are we going to do when 10 years pass and we've built this -- we've R&D'ed the facility. I mean, you didn't give that fellow the real figure, because before we construct the facility, there's the R&D to do this. So it is probably twice as much as what you told that fellow.

So we're going to do that for 10 years. Then for 15 years, we're going to produce MOX, and then we're going to clean up the environment. Yeah, right, you know.

So I have a question for you. Our representative, Nan Orrock, who is represented here tonight, asked at a legislative meeting in Georgia, and DOE was present singing the

praises of this program and the jobs it would bring to the Augusta area -- asked and did not receive an answer. So tonight I give you an opportunity to answer, or the question will be on the record, and you can supply the answer and maybe somehow or another I'll hear about it. I did not get an invitation to this either, but I get all the big books. You know, I got the PEIS. As a volunteer, I don't know when I'll read that.

What was said, as an assurance to Georgia, whose stake in this is to have jobs in the Augusta area, was DOE stated we have a very -- a high interest in maintaining the work force at a steady level, and will provide jobs at a steady level. We will need you at a steady level.

Ann Orrock's question was, and what we are very interested in the answer to is: Have you maximized your effort, both financially and in personnel, for environmental cleanup?

MR. NULTON: I'm not sure -- maybe you need to clarify the question. Maximize in what regard? I mean, how do we plan for it --

MS. CARROLL: Well, this is my thing. In 1990, that was what we were going to do program wide, and we had a budget, and we've since fallen off on the level of will and the level of money we're putting into cleanup. So I'm kind of baiting the question.

MR. ANDERSON: Okay.

MS. CARROLL: I know we haven't maximized it, but I want to hear you tell maybe what the maximum is.

MR. ANDERSON: Let me try and address that a little bit. I'm not sure I can say whether we've maximized it or not. But the Savannah River Site does have an integrated priority list of all of its activities for the amount of budget that it gets.

And the share that the environmental restoration and the cleanup programs are receiving at Savannah River is a higher percentage than it has received in the past.

The other activities that are there that are related are stabilization activities, which I referred to earlier. And that makes up most of the Savannah River budget at this point.

MS. CARROLL: Which is 90 percent or --

MR. ANDERSON: 90, 95. When I say most, I'm not talking about just the majority.

MS. CARROLL: Are you going to maintain spending on cleanup at that level while bringing up the MOX and the immobilization program?

MR. ANDERSON: That is the plan.

MS. CARROLL: So actually, jobs will increase quite a bit, because everybody working on cleanup will stay working on cleanup, and everything else will be extra on top of that?

MR. ANDERSON: If it's related to in peer of people, as far as that's concerned.

MS. CARROLL: So people should be moving to Augusta to get these jobs.

MR. ANDERSON: Now, the other aspect of this is that these contracts are being let -- you know, with bringing in some new talent, bringing in some additional -- you know, the joint -- I want to call it a joint venture, and that's the wrong term.

MR. NULTON: Consortium.

MR. ANDERSON: Consortium with Duke,

Cogema, Stone and Webster. So the real intent, as far as the employment levels, we're looking at the longterm employment levels for the more permanent employment at the Savannah River Site.

In fact, there was -- on a routine basis, we do demonstrate and show people, you know, where we're doing environmental cleanup. We are making quite a bit of progress in cleaning up the sites and cleaning up waste and taking waste that was in forms and placed into the areas which were thought to be well planned years ago. We're pulling some of those back, vending drums, repackaging, checking. There's cleanup of groundwater systems that's occurring of plumes. There's closure of disposal sites that are occurring. The defense waste processing facility is operating and disposing of high-level waste in a stable form. And the canyons purpose at this point is to stabilize nuclear materials.

MS. CARROLL: That's one of the attractive things about the immobilization option. I'd like to see it increase. I mean, if we continue with our disarmament efforts,

there's going to be a steady stream of plutonium triggers that need to be dealt with, and to increase the rate at which we're able to take that stuff out of the deteriorating paints and solidify it. That is a really attractive idea, and we support it. We want to be supportive of South Carolina in dealing with this.

So thank you so much for having this opportunity tonight.

SENATOR LEVENTIS: Thank you. Joan King, and then Ed Arnold.

MS. KING: I found a penny. Do you think it's lucky?

SENATOR LEVENTIS: I certainly hope so.

MS. KING: There. I'll put that to the DOE. I think they need it at this point.

I want to thank everybody here for their patience and for their endurance. I'm Joan King. I've worked on nuclear issues for a number of organizations for many years now. I'm also the spokesperson for WAND, which is Women's Action for New Directions. And I will try to be brief.

I'm going to make some statements of things -- assumptions from what I've heard, and you can just say yes or no.

I am part of an activist community working on nuclear issues, and I hear that the -- on one hand, I hear that we're going to do this because we have to do MOX because the Russians want it. Am I hearing correctly? Because I also heard the opposite, that we suggested it to the Russians.

MR. NULTON: I think that this is a result of the negotiations with the Russians, where they wanted to do one thing, and we have evolved to this point, that they wanted to use it in breeder reactors.

MS. KING: Okay. Well, which Russians? I mean, I'm part of the activist community. They are -- my counterpoint has come to this country, activists who are Russian citizens, and they say, We don't want this.

MR. NULTON: Well, we negotiate with the Ministry of Atomic Energy in Russia. It's a government to government --

MS. KING: Uh-huh. So government to government. But people to people, the people

don't seem to want it.

We have talked about plutonium. Is it true that the amount of commercially produced plutonium, reprocessed plutonium, in the world today is growing?

I have read that it is growing so that it will soon exceed the amount of military plutonium from the military reprocessing. Can anybody answer that?

MR. STEVENSON: The first statement that the amount of plutonium in the world as a result of civilian reactor operations is growing, yes.

MS. KING: Is growing.

MR. STEVENSON: That is correct. Whether the amount that's military in weapons-grade and the amount that's at civilian grade, one versus the other, I do not know.

MS. KING: Well, I've seen projections that if the amount of commercial -- well, I don't -- I've been working on how you phrase it. We'll just say commercial plutonium versus military plutonium. That the amount of commercial plutonium is growing, and if it continues the way it is, it will soon exceed

the amount of military plutonium in the world.
Does anybody dispute that, or can they answer it?
SENATOR LEVENTIS: Yes. If you want to talk to Dr. Makhijani later, he can supply you with the numbers. I don't know that they are --
MS. KING: I just wondered if it was true or not. I don't really need the numbers.
The point I'm getting to is that I think our problems come with plutonium. I realize that a -- the weapons-grade is probably more desirable on the terrorist market and for Rogue nations. But we also have admitted that we can make nuclear bombs, and that our country has done it as a test from commercial plutonium.
So I'm saying that I think the plutonium itself is the problem, and that MOX will not decrease the amount of plutonium in the world. Even as it degrades some of it, it will contribute to the general increase of plutonium in the world. That is why I'm worried, as a citizen and as a member of a number of organizations.

Then I'm very concerned as a citizen about the amount of money that's going into this, and I would like to ask the DOE about a rather local problem.
In Georgia, we're concerned about the contamination of the groundwater from the SRS. And they were doing some testing of the wells, and we had -- apparently there was money from it, and they found things that showed there was tritium in it. I'm not sure about what else they found in the groundwater. Then all of a sudden, there was no money for the -- when I asked our department, EPD, they said, the money -- we don't have the money to test the wells anymore.
Now, I'm disturbed that -- I mean, I'm a mother and a grandmother, and we have a policy with my -- if you made a mess, you clean it up before you start all over again. I just think we need to clean up what we've got before we begin on another major project that is going to be very expensive and produce more waste.
So thank you very much for this opportunity.
SENATOR LEVENTIS: Thank you,

Ms. King.
Mr. Ed Arnold, and then Mr. Harry Rogers.
MS. CARROLL: If I could just give you that figure. I know we're all dying to know how many megawatts we're going to use to make MOX. May I?
SENATOR LEVENTIS: Yes.
MS. CARROLL: 17,520 megawatt hours a year. I don't know how that translates to a 1,000-megawatt plant.
SENATOR LEVENTIS: It sounds awful high.
MR. NESBIT: There's a lot of hours in a year.
MR. STEVENSON: Very low.
MS. CARROLL: It's low?
MR. NESBIT: It's not that much.
MS. CARROLL: There's the facts.
SENATOR LEVENTIS: The gentleman from Cogema had said that it's not an energy-intensive process.
MS. CARROLL: All right. I wanted a figure. Now we know.
SENATOR LEVENTIS: Okay. We've got

several more people to hear from, and we will hear from everyone. Please address questions, if you can. And if you have statements, please limit them as may be appropriate.
MR. ARNOLD: Senator, this has been really great. Thank you so much.
My name is Ed Arnold. I'm the executive director of Physicians for Social Responsibility. Our office in Atlanta serves Georgia, South Carolina, Alabama, and Florida, in terms of staffing in the southeast.
Our health professionals and physicians are opposed to the MOX program. They think the risks are too great. And I want to know who are the health professionals and physicians that contributed to the EIS and the supplemental EIS?
MR. NULTON: We used the SIC organization to do our environmental analysis, and they have experts on this to do these analyses.
MR. ARNOLD: Would it be possible for our health professionals and physicians, numbering over 10,000 across the country, a representation of those, to sit down with your

health professionals and figure out what the differences are, perhaps resolve our positions of difference?

MR. NULTON: That's why we've had over 90 public meetings up to this point. That's why we have an Environmental Impact Statement, to put that out, get the comments, and resolve the comments. We do that in the public meetings.

MR. ARNOLD: Have your health professionals been onhand to try to resolve the differences --

MR. NULTON: Yes. We've had experts at our meetings to answer questions, yes.

MR. ARNOLD: So in your view, it would be a repetition of the public events that have already occurred?

MR. NULTON: Well, we've had these people at these meetings, and we've had a number of representatives from Physicians for Social Responsibility in our meetings around the country in the northwest and --

MR. ARNOLD: But we still have our differences that aren't resolved.

Well, I'd like to make a statement

that PSR would be interested in pursuing the issue so that we can -- certainly, the immobilization program has its risks, not burning -- not irradiating rods anymore has its risks, because we might have to use more coal in the interim until we -- (inaudible) -- energy sources.

I mean, there are risks with everything that we do. I wish I were hearing more about some acknowledgment that risks do exist.

But PSR thinks that the risks attendant with the MOX program are more serious than if we went strictly with immobilization.

I wish we had the opportunity to sit down with our professional people together to see if we could resolve the differences. And as I'm hearing it, you think that we've run our course on it, and I'm sorry that's the case.

SENATOR LEVENTIS: Well, let me just make a comment that what I have heard this evening and what I've heard as I've researched this, is, you may well be true that it's not an absolutely risk-based decision, and that they feel their responsibility is to reduce the risk

as much as possible.

And probably the more significant thing you can contribute would be a way toward that end, as opposed to this simple notion that one option may be heavily risk weighted than another, because the idea of simply storing material has its risks, and the idea of allowing the Russians to have no organized disposition has its risks, as well.

So I would suggest that that's probably where you need to be, because I don't believe that the facts of your statement, although I think they're true, would change the direction of the department unless you can offer some opportunities that they can understand would reduce the risk. Is that a reasonable statement?

MR. NULTON: I'm not sure if I understood the whole statement. I think, again, we accept any and all comments, and we try to respond to each one. We do respond to each one. I think up to this point, we've responded to the comments we received in our previous EIS's, and we'll respond to the ones received in this EIS in our final document.

MR. ARNOLD: Senator, thank you very much. This has been a wonderful meeting tonight.

SENATOR LEVENTIS: Thank you for coming.

Now we have Mr. Harry Rogers, and after him is Mel Jenkins.

MR. ROGERS: I'm Harry Rogers, outreach coordinator for Carolina Peace Resource Center. I appreciate first steps. Thank you, Senator Leventis.

I'm going to frame my question with an op-ed piece, and not read the whole op-ed piece.

First, from Brad Morris, was at a DOE reorganizing hearing. It's a quote from Warran Rudman, an ex-senator.

The focus here and in the Senate is understandably on security. I want to be clear. The security is only a system. Mismanagement and arrogance are pervasive everywhere at DOE.

I don't know that I agree completely with what Senator Rudman has said, but I have not felt a part of that public participation process. I think that you should realize that you're going to face significant opposition to the decisions that you've made here that are going to result in unnecessary costs, and I think that you've been dismissive of those that have been against MOX.

Mike Tuckman, executive vice-president of Nuclear Generation with Duke Power Company, says he has difficulty understanding why anyone would have a problem with the MOX, mixed-oxide, fuel option of weapons-grade plutonium disposition.

This is an arrogant statement. Had Mr. Tuckman attended either the legislative briefing conducted by Senator Phil Leventis in Columbia or the public hearing conducted by local and national groups at the University of South Carolina, he would have heard a panel of six experts outline the economic, environmental, security and health reasons against MOX.

Subsequently, I made two telephone calls, at least, to Duke Energy requesting that Mr. Tuckman provide me with contact information. That was two and a half months

ago. To this date, they have not replied.

Briefly, through my work with the Carolina Peace Resource Center, along with other groups, we will be holding hearings throughout South Carolina concerning nuclear issues. We will hold ourselves answerable to the public. Will you?

And last, I work at V.C. Summer Nuclear Generating Station in Jenkinsville, a plant made world-class by its employees. If this were happening at my plant, I would oppose the use of MOX fuel just as vigorously.

If I can go back. Dr. Lyman said recently, While Duke Power claims that the use of MOX in France is safe, it does not plan to employ even the minimal safety adaptations used in France. It does not intend to install additional control rods in its reactors, or to place limits on the irradiation time of the plutonium fuel versus the uranium fuel, both of which are done in France. Duke is cutting corners here in a way that could seriously impact safety.

Now, I know the representative from Duke Energy is going to be able to give me some

prepared answers.

What is at issue here is not the fact that you have the answers. It's what was brought out earlier. It's that an aggressive attempt to involve the public in such a significant decision is absent, and we should have had the opportunity to ask these questions. And it's unfortunate that you've placed us in an adversarial position where over the next year and a half we probably will ask these questions at a good deal of expense to both of us. And I really feel that it's unnecessary, and I would like for you to address the technical questions that I've asked.

MR. NESBIT: You cited Dr. Lyman's statement that implied that Duke would cut corners in a way that could seriously impact safety, not intending to install additional control rods or to place limits on irradiation time of the plutonium fuel.

Dr. Lyman's statement is erroneous. We never said that. As we've said today, we are going to thoroughly study the impacts of using mixed-oxide fuel on our plants and make

whatever modifications are necessary to ensure the safety of the workers and the public.

Because at this present time we do not see the need to add control rods in order to achieve reactivity control at our reactors does not mean that we're cutting corners on safety. If it turns out that for some reason they are needed, we'll make those modifications.

I'd also like to address another point. Duke Power has been very open with the public and the media about its involvement in this program, going back to 1996, when we first responded to the Department of Energy's request for interest from commercial public utilities.

At that time, approximately 18 utilities responded to DOE's RFI. We made our response public. We have been open every step of the way about our involvement up to when we submitted a proposal back last fall, and when we received our contract this spring.

Furthermore, if the program goes forward and we're going to use MOX fuel at our plants, the NRC licensing process provides an ample opportunity for public involvement in the

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surrounding communities, and we look forward to those opportunities.

MR. ROGERS: Thank you. Just in closing, I don't find it comforting that we're going to do all these studies about how we're going to use this MOX fuel sometime after we've spent a significant amount of money to build the facility.

SENATOR LEVENTIS: Thank you.

Mr. Mel Jenkins, and after him is Claude Gilbert.

MR. JENKINS: It is still evening. Good evening. I'm Mel Jenkins. First of all, thank you, Senator Leventis, for bringing this about.

I'm here as a part of Environmentalists, Incorporated, and as an active participant in dealing with civic and community process toward direct advocacy and through the neighborhood project. In both of those roles, I have several simple questions, and you will be surprised that they are questions.

Number one: I would like to repeat Mr. Kawaguchi's question about International

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Nuclear Services here in Columbia. Will there be more contaminated materials coming to that INS plant? Call this 1A. Since logic impels the handling of this material will produce more contaminated items as a result of handling MOX materials, how much more will be coming here to Columbia? That's a specific question, which, of course, you can't answer tonight, but I would appreciate some workup on that. That is important to us here.

Number two -- again, I regret that there's not an agenda, so I don't know the names of the people participating here. So I'll simply say, DOE said tonight there have been over 90 public meetings on this issue. I would appreciate a list of those, giving dates, places and such, and that's a question. Will you provide that?

Number two: What public meetings have been held here in South Carolina?

Number three: What public meetings have been held in Georgia? And you can answer that tonight, I think.

MR. NULTON: I don't know the number of meetings that we've -- I don't know the

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dates and so forth or the exact number, but we've had several meetings in North Aiken, I guess -- in North Augusta, rather, Aiken.

MR. STEVENSON: I can name some of them.

MR. NULTON: Go ahead.

MR. STEVENSON: To name some of those meetings, one of the very first ones was a planning and scoping meeting for our programmatic -- in 1994 in North Augusta.

There was another meeting for the draft of the PEIS in North Augusta. There was one on highly enriched uranium disposition in Augusta itself.

There was another one on the scoping in the final of the HEU. There was a meeting on the scope of this draft EIS. There was a meeting on the draft of this EIS. There were some other group meetings where the public was invited between those meetings on specific topics. I don't remember exactly what they were, but that's the ones that I just remember off of the top of my head.

MR. JENKINS: So all these meetings were in the back yard of the Savannah River

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Site, some of which I have heard characterized as pep rallies, none of them held in Atlanta, none of them held in Columbia; is that correct?

MR. STEVENSON: Yes, there was one meeting held in Atlanta in this process. I believe, it was in -- and I'll double-check myself. It was in 1995 that we held the meeting in Atlanta.

MR. JENKINS: And I would, of course, be interested in the publicity that was given to those meetings.

So given that it seems like there was some decision made to limit public input on this issue, I would be very interested to know who arrived at the public input plan for this process.

Again, I think we here in Columbia certainly would feel that we have been excluded from the process; and therefore, I would be very curious as to who it was specifically, by department and by names, that decided that there would be a limited public input on this.

And three: Is this the new DOE policy regarding public input?

Thank you.

SENATOR LEVENTIS: By the way, if you have asked for a specific response --

MR. JENKINS: I don't expect it tonight.

SENATOR LEVENTIS: -- please give that person that you asked -- this applies to anyone who asked -- your name and address so that they may be able to access you.

MR. JENKINS: That's on the sign-in form. Do I need to do that separately?

SENATOR LEVENTIS: No. You need to do it in addition, because it's hard for us to pull out each individual person that may have made a request to any of these gentlemen on the panel here.

MR. JENKINS: Thank you.

SENATOR LEVENTIS: Did anybody want to address that?

MR. STEVENSON: Was the number of them -- within the department as to who makes the policy of what meetings we have, that is a process as opposed to one individual.

But typically, it is the head of our office, and it -- we've had several office directors who make that. It's also done in

consultation with our Office of General Counsel, our lawyers, and with the Office of Environmental Policy and Assistance. So that it's reviewed by the people who are in charge of the National Environmental Policy Act Enforcement, our lawyers, and the people within our office, as a minimum.

MR. JENKINS: Thank you. I realize that you're saying it's difficult to arrive at a person or a particular -- but I've worked with the government myself and have dealt with them enough to know that paperwork is the essence of government, and that you have to sign off on things like that.

So there is a paper trail that could be arrived at.

MR. STEVENSON: That is correct, because part of the requirement of the National Environmental Policy Act is that you prepare the administrative record, and that administrative record contains that type of information upon which those decisions are arrived at.

MR. JENKINS: That will be interesting.

SENATOR LEVENTIS: Thank you.

MR. JENKINS: Thank you.

MR. ROGERS: Senator Leventis, I just wanted to submit this for the record.

SENATOR LEVENTIS: Just bring it around.

Next would be Mr. Claude Gilbert, and after him is Mr. Bert Cutts.

MR. GILBERT: Thank you, Senator, for this meeting tonight. I'll be very brief, because I think we've touched on most everything.

I would like to say for the record I think that I would like more discussion on the environmental record of Cogema. I think we let him off mighty light tonight. There's a lot of questions concerning what's going on in France, and the contamination, and it's pretty well-known. So I know there's some violations there. I'm very much concerned with Cogema working on this project.

I have a statement I would just like to leave for the record, I think.

I have one question for Duke Power concerning the fuel rods. I remember reading

before that I think you all have removed them from reactor to another reactor.

Are you planning on doing that type of thing with this MOX?

MR. NESBIT: No. You're referring to transshipment, which occurred between Oconee and McGuire, when we were running out of space in the Oconee spent fuel pool. We've since instituted on-site dry storage of the sites that need it. We have no plans for doing that with mixed-oxide fuel.

MR. GILBERT: Thank you. If I can just submit this.

SENATOR LEVENTIS: Thank you. Just bring it on around.

I think it's Mr. Bert Cutts, C-u-t-t-s.

SPEAKER: He's already gone, sir.

SENATOR LEVENTIS: Brian Carnes and then Mr. Michael Moore. Are they here? We've outlasted. Okay.

Merison Niri, N-i-r-i? Shin Yun? It seems Mr. Cutts signed up twice, and he's not here once.

(Laughter.)

SENATOR LEVENTIS: Mr. Poe?

MR. POE: Thank you, Senator. I appreciate the opportunity to be here tonight. And Mr. Nulton, thank you for coming and sharing with us.

Up front I'll tell you that I'm pro-MOX. Okay? I'm just disappointed we don't go further than one pass with it, but that's not the question at hand tonight.

I will say that I am -- consider myself to be informed, and I've been very slightly tasked here tonight to be informed. This is a complex subject that we're talking about.

I've heard citizens on both sides of the coin. I learned from both. I said I'm pro-MOX. So I'm in favor of this activity.

The most compelling story that I've heard tonight was the one that Mr. Chaput talked to when he talked to the fact that by denaturing this material we're moving in the right direction. If we don't get all the way there, we at least are moving in the right direction.

I do have two points that I want to

make. They'll turn out to be questions, I hope.

The first one is: You know, there's been a lot of discussion about we don't understand what all is going on here tonight. They are questions which tells me, in my limited knowledge, that we're not meeting often enough.

So I would like to address you, Mr. Nulton, and say what are we going to do about that? You've got citizens of South Carolina, citizens of Georgia that are interested in your program. Some opposed to it. Some for it. But nonetheless, there are probably questions among all of us that don't have the benefit of all the time and effort that you guys have put at it to understand that.

Let me just tell you that I spend probably three or four days a week working to understand the goings on at Savannah River. I'll tell you that my judgment is that after you work the problems well, you and they meet in a meeting of the minds, and you understand where each other is coming from and where

they're going. I haven't gotten to that point with this program yet.

So what are we going to do about that?

MR. NULTON: Part of our effort, now that we have DCS under contract, is to develop an outreach program. We're in the process of doing that. I'm not sure what nature it will take, but it is one of our activities that we're undertaking.

MR. POE: Well, I would encourage you to do that strenuously because there have been an awful lot of people here who are stakeholders of this activity that you're planning for us here, and we don't understand, and we have nagging concerns that continue with us.

Now, the second question. Senator, I guess I address this one to you. You were nice enough to set up this meeting. And for the first two hours, about 60 of us sat out here and listened to you all talk back and forth about things we didn't even know what you were talking about, because there were pieces of paper -- and I made a list of seven things

that you talked about in that two hours that we don't have copies of. Now, if we're going to be informed citizens, we need to have that information.

The list that I ended up with were the environmental synopsis somebody mentioned, and I don't remember who that was; the cost report; the contract, a copy of what the contract looks like; the contract cost analysis that someone referred to. In September, when we get the U.S. Russian agreement, we need to see that. Then so that we can remember all these good things that you guys have talked about, Senator, I would like to suggest that this group of papers that have been talked about here be mailed out to the people who came here, along with a copy of the transcript of the meeting so we can hear the questions and read some of the information.

I'll tell you, for one, that I don't like to read, but I do read an awful lot of this kind of stuff to keep myself informed so that I can become a reasonable stakeholder and understand the process.

So can we arrange something like

that? I don't know whether it's you or whether it's Mr. Nulton. Everybody had different pieces of paper that most of us sitting out here in the audience didn't have.

SENATOR LEVENTIS: Certainly it's a valid criticism. We didn't know how many folks to expect, and we will try to arrange the results of this meeting and the transcript into some logical fashion and see who among those who are here would like it because -- and I see one taker already -- because that's the purpose of having the meeting.

So we'll try to get that together in conjunction with the Department of Energy, who was very supportive in our efforts to get the meeting together.

In relation to one criticism that we had earlier about a notice that the meeting was going on, of course, we did publish it widely in the public media. We did also mail to a list provided to us by the department, and I don't know precisely the origin of that list, but -- how was it constructed?

MR. STEVENSON: I think I can answer that and would like to offer my comments.

The list -- over the past five years that we have been a program, we have been collecting a stakeholder database. That stakeholder database is now up to 7,500 individuals of which 1,300 are South Carolinians.

MR. POE: Good. I'm glad we're represented.

MR. STEVENSON: Of the 1,300 South Carolinians, they represent 100 individual communities around the state who are on our routine mailing list.

We try very hard to keep that mailing list up to date, but people move, and we only make mailings every so often. But we really do try to make sure that everybody who wants to receives copies of our information.

Further, Senator, I'd like to make a suggestion that might help out here. When the transcript is prepared and you're going to make distribution, if you could, put a statement in there that if people are interested, who have access to the worldwide web, they could get all of the documents that you mentioned from there, or we have a mailing address where, if they

wish to get those by mail, they can also do that.

One other new piece of information also that I would add is that, since we entered into a partnership with DCS, our website will now include linkages to these partners that we have so that you also can gain information from their websites, so that you have an ability -- if you were interested in more of the Cogema information, you could go directly to that site and obtain what information that they have there --

MR. POE: Thank you.

MR. STEVENSON: -- which also includes mailing addresses, so that you aren't fully dependent on the web for these documents.

MR. POE: Well, I, for one, received my invitation in a white envelope. It didn't look like a DOE envelope. Senator, I thought you had mailed it to me. It was a plain white wrapper. I saw in the Augusta paper yesterday the announcement of the meeting. I had received the announcement out of The State several days earlier.

So I was aware of the meeting, and

the Aiken/Augusta area stakeholders do communicate with each other, and we talk a whole lot. So that word gets around.

I want to thank you again for having us here tonight and sharing this information with us. It's a little bit frustrating to try to understand and take it all in. So help us, bear with us, and continue this sort of thing. Thank you.

SENATOR LEVENTIS: I should point out, of course, that the Department supplied us with a large list of folks to mail to, and they also supported us with the postage and whatnot to make that mailing.

In relation to a comment you made, when we do prepare the transcript, we will try to prepare an index of the documents that we used or were referenced so that you might be able to go get them.

Mr. Poe, do you use the worldwide web?

MR. POE: I'm a -- while my friends up here -- let me just -- yes, I do a little bit. I'm not terribly fluent. I got a copy of a defense board thing sent to me this morning that I couldn't open and read, and I had to get somebody else to come help me figure out what was wrong with my web.

SENATOR LEVENTIS: But you do access that?

MR. POE: Yes, sir, I do.

SENATOR LEVENTIS: That's fine. Ms.--

MS. THOMAS: I wanted to correct an oversight. I wanted to thank you, Senator Leventis, and I wanted to speak to Mr. Stevenson.

Even though I've been doing it all these years, I'm still not comfortable standing up and talking to people, but I think I do better on the telephone one to one. So thank you both.

SENATOR LEVENTIS: Is there anyone else that I have not recognized that would like to speak?

In fact, of course, I didn't get to raise all the questions that I would like. That may sound strange, but it's true. I have passed some questions on to some of the gentlemen here.

But my main purpose, I think, has been met, and that is to bring everyone together and to create more of a record available to these gentlemen, to us, as we discuss these issues.

I would like to thank first and foremost those people who supported this meeting, Ms. Jeter, and the people from security who have been here all day, because I've been here with them. We appreciate you being here a great deal, and those folks who have come from out of town. I know a lot of you have. From DOE, Mr. Stevenson, Mr. Nulton, Mr. Selby, and a lady whose name I did not get. I'm sorry.

MR. NULTON: Pat Wherley.

SENATOR LEVENTIS: Ms. Wherley. Those folks from Melox and Cogema, Mr. Ihde from Duke, Cogema, Stone and Webster, and Mr. Nesbit from Duke. All those folks who came representing Representative Orrock from Atlanta, and our Representative Clyburn, Senator Courson, Dr. Makhijani, Mr. Brown.

We did what I intended to do. We took about as much time as I thought we would

to do it.

So with that, unless anyone else would like to comment --

MR. NULTON: Senator, can I just make one brief comment? Can we enter, for the record, from Cogema some reports on their facilities?

SENATOR LEVENTIS: Yes, please. We would like that, and if we need any more, we can certainly give you those.

MR. NULTON: And also, I would suggest, if you want to enter for the record, the question and answers that we sent to you in there under the Cogema section of that document are two websites that were identified that also provides access to Cogema environmental data that would perhaps help some folks.

SENATOR LEVENTIS: All right. We'll do that. Anyone else? Thank you for your great patience and all of your input and participation.

(The proceedings concluded at about 11:22 p.m.)

CERTIFICATE OF REPORTER

I, Lisa D. Jeter, Court Reporter and Notary Public in and for the State of South Carolina at Large, do hereby certify:

That the foregoing proceedings was taken before me on the date and at the time and location stated on Page 1 of this transcript and was recorded stenographically by me and were thereafter transcribed; that the foregoing proceedings as typed is true, accurate and complete record of the proceedings to the best of my ability.

Witness my hand, I have hereunto affixed my official seal this 2nd day of September, 1999, at Columbia, Richland County, South Carolina.

Lisa D. Jeter
Court Reporter, Notary Public
State of South Carolina at Large
My Commission expires
September 11, 2002