

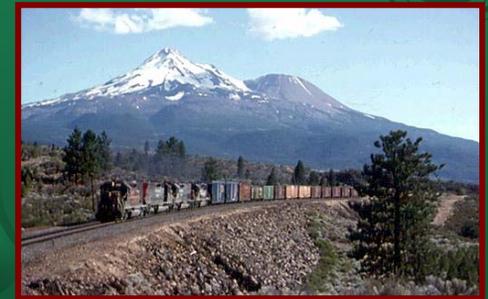
U.S. Department of Energy Environmental Management

Opportunities for Continuous Improvement & Operational Excellence in DOE's Transportation Operations

Dennis Ashworth

Director, Environmental Management
Office of Transportation

*Transportation
External
Coordination
Working Group,
March 2006*



Department of Energy's Office of Environmental Management

- The mission of the Office of Environmental Management (EM) is the accelerated risk reduction and cleanup of the environmental legacy of the nation's nuclear weapons program and government-sponsored nuclear energy research. The program is one of the largest and most diverse and technically complex environmental cleanup programs in the world and includes responsibility for the cleanup of 114 sites across the country. Included in that responsibility is the need to:
 - Safely disposition large volumes of nuclear wastes;
 - Safeguard materials that could be used in nuclear weapons; and,
 - Deactivate and decommission several thousand contaminated facilities no longer needed to support the Department's mission and remediate extensive surface and groundwater contamination.



Department of Energy's Office of Environmental Management

❖ EM scope includes remediation, processing and transportation of approximately:

- 25 tons of plutonium
- 108 tons of plutonium residues
- 88 million gallons of radioactive liquid waste
- 2,500 tons of spent nuclear fuel
- 137,000 cubic meters of transuranic waste
- 1.3 million cubic meters of low-level waste



DOE - Environmental Management Office of Transportation

Our Mission -

Provide DOE and our internal and external customers with the highest quality support and expertise that results in efficient, cost-effective, secure and compliant transportation operations, while keeping our workers, the public and the environment safe.



U.S. Department of Energy, Environmental Management, Office of Transportation
Dedicated to Protecting the Public and the Environment in all our Transportation Operations

DOE - Environmental Management Office of Transportation

Our Vision -

- We'll be leaders in achieving transportation safety and operational excellence.
- We'll use best practices from government and industry to provide our internal and external customers with the highest value planning, compliance and operational expertise.



Operational Excellence in Radioactive Material Transportation

- **Protecting the Public and the Environment**
- **Regulatory Compliance**
- **Risk Management**
- **Knowledge/Expertise Dissemination, Training**
- **Documented & Followed Standard Operating Procedures**
- **Inspections, Inspections, Inspections**
- **Continuous Process Improvements**
- **Technology Exploitation**
- **Data & Reporting**
- **Integration**



Transportation Safety our Critical Focus

Striving for Operational Excellence

- EM Office of Transportation was established to develop and institutionalize transportation operational excellence and safety within EM Headquarters and at EM field locations. Office organized into three areas of focus:
 - Distribution Risk Reduction & Site Support
 - Legislative & Regulatory Affairs
 - Emergency Preparedness, Security & Outreach



EM Office of Transportation - Striving for Operational Excellence

Distribution Risk Reduction & Site Support

- Distribution Risk Prioritization
- Distribution Routing & Network Optimization
- Risk Analysis Applications (Tragis/Radtran)
- Distribution Reviews & Best Practice/Lessons Learned Communications
- Transportation Performance Metrics
- Prospective Shipment Module (PSM)
- Automated Transportation Management System (ATMS)
- Radcalc
- Transportation Management Council
- Secure Transportation

Legislative & Regulatory Affairs

- Federal & State Legislation and Congressional Affairs Support
- Regulatory Monitoring, Interpretation, Advocacy, Exemptions and Communication
- Regulatory Compliance Training
- Internal & External Site Compliance Reviews
- Packaging Standards Development & Packaging Management Council (PMC)
- Carrier Safety Standards, Auditing & Tenders
- Commercial Vehicle Safety Alliance (CVSA)

Emergency Preparedness, Security & Outreach

- Transportation Emergency Preparedness Program (TEPP)
- Incident Reporting, Root Cause Analysis & Preventative Measures
- E/R Training and Drills
- E/R Contractor Identification & Audits
- Shipment Approval, Security & DHS Liaison
- State Relations
- TransCAER & Commodity Flow Surveys
- Public, Tribal, and Local Outreach
- Web Information and Transportation Plans



EM Office of Transportation

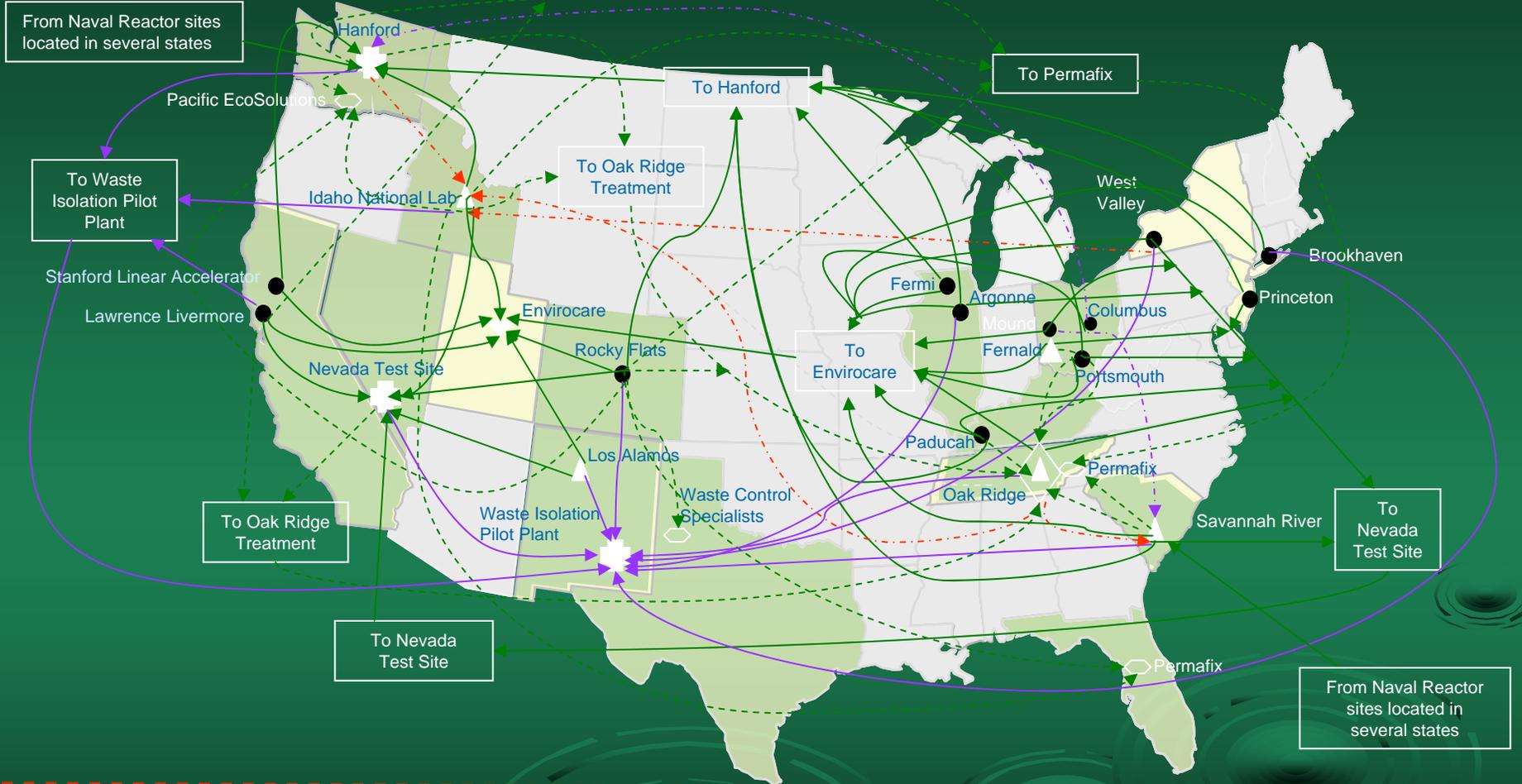
Our Measures of Success –

- **EM shipments are measurably safer;**
- **Our services are sought, and our practices emulated by other government programs and private industry;**
- **Federal, State, Tribal and local officials, affected parties, and the public actively support and participate in our work.**



The Challenging World in which we Live!

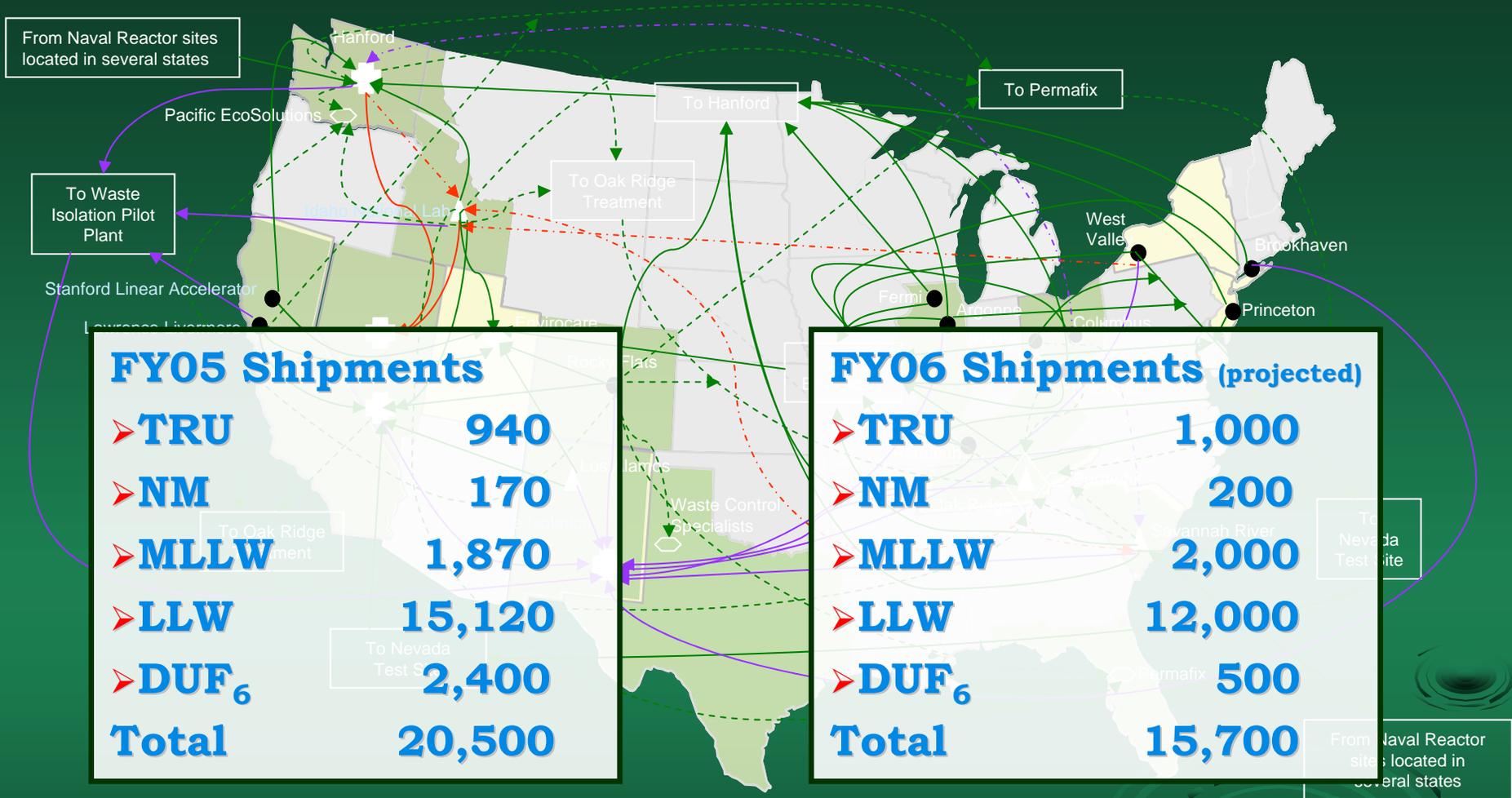
Shipment lines do not portray actual transportation routes. This map is not inclusive of all past or planned shipments.



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Shipments decreasing as EM completes its mission

Shipment lines do not portray actual transportation routes. This map is not inclusive of all past or planned shipments.



FY05 Shipments

➤ TRU	940
➤ NM	170
➤ MLLW	1,870
➤ LLW	15,120
➤ DUF ₆	2,400
Total	20,500

FY06 Shipments (projected)

➤ TRU	1,000
➤ NM	200
➤ MLLW	2,000
➤ LLW	12,000
➤ DUF ₆	500
Total	15,700



Prospective Shipment Report

- Issued every six months to provide guidance to states on planned EM shipments
- Most recently issued to Regional Council of State Governors Organizations - February/2006

Shipment Title	Origin	Pass Thru States	Destination	Number of Shipments & Mode	Material	Isotopes	Comments
Fernald Soil Pile 7 Shipments	Fernald Closure Project - OHIO	OH, IN, IL, MO, KS, NE, CO, WY, UT	Envirocare of Utah, Inc. - UTAH	22 Rail (Unit Trains)	Radioactive material, LSA, n.o.s.	U-235, U-238, Th-230	Shipped via 60 railcar unit trains. Scheduled to be completed by April 2006. LSA - Low Specific Activity. Point of contact: John Sattler, DOE, Consolidated Business Center
Fernald Silos 11e.(2) material	Fernald Closure Project - OHIO	OH, IN, IL, MO, KS, CO, WY, UT	Envirocare of Utah, Inc. - UTAH	112 Truck	Radioactive material, LSA	Th-230, Ra-226, Po-210, Pb-210, Ac-227, Pa-231	Point of contact: John Sattler, DOE, Consolidated Business Center / Ohio Field Office



Rocky Flats Status

- All buildings and structures removed.
- All shipments completed and Kaiser-Hill has declared physical completion at the site
- In probably 2-3 years the significant portion of the site goes over to the Department of Interior to be used as a wildlife refuge.



Fernald Silos 1, 2 & 3

➤ Silo 1 & 2 shipments to WCS

- ~2000-2200 shipments expected total
- 1325 shipments in 2006 should be complete by August, 2006



➤ Silo 3 shipments to Envirocare

- 112 truck shipments should be completed by end of CY2006



Oak Ridge Shipping Activities

- **DUF₆**
 - >4400 cylinders shipped to Portsmouth
 - ~5951 cylinders total
- **Haul Road**
 - Completed in 2/06
 - Will significantly reduce commercial shipments
- **150 LLW truck shipments to Envirocare planned FY'06**
- **235 LLW truck shipments to NTS planned FY'06**



West Valley Shipping

- Currently shipping LLW to:
 - Envirocare by rail (10) and highway (48) in FY'06
 - NTS by highway (60) in FY'06



Savannah River Shipping

- LLW & MLLW to Envirocare & NTS
- TRU shipments to WIPP (approx. 157 in FY'06)
- Neptunium (for NASA space programs) to INL



Brookhaven National Laboratory

- LLW shipments by rail to Envirocare completed for this FY – will resume in 2007
- Recently completed 2 Type B shipments of RAM to LANL.
 - Included three 55-gallon drums containing activated metals and sources



Mound Status

- Closure on track for 2006
- Completed TRU shipments to SRS
- Continue LLW rail shipments to Envirocare (1200) in FY'06



Paducah & Portsmouth

- Paducah shipping LLW by truck to NTS (300) in FY'06
- LLW shipments by rail to Envirocare continue
- Portsmouth continues LLW shipments to NTS (377) in FY'06



Transportation Safety our Critical Focus

Striving for Excellence in All Areas of Responsibility:

- ATMS
 - Utilization at ALL EM sites;
 - Enhanced reporting capabilities;
- Traxis/Radtran
 - Validation of accident rate and release probability data;
 - Increased population density data;
- Radcalc
 - Improved user manuals and training;
 - Greater coordination with DOT and DOE on calculations;
- STAAB/STPSC
 - Definitive high level waste consolidation plans;
 - Improved advanced planning for secure shipments;
- Prospective Shipment Module (PSM)
 - Improved data accuracy for state/regional contacts;
 - Web-based;
- Commercial Vehicle Safety Alliance (CVSA)
 - Best in class program that needs to be more fully exploited.



Transportation Safety our Critical Focus

Opportunities for Improved EM Transportation Performance:

- Carrier Tenders/Contracts
 - Consideration of carrier rate negotiations vs. tenders;
 - Complete integration with MCAP process and ATMS;
- MCAP – Motor Carrier Assessment Process
 - Greater detail and increased frequency of on-site carrier HQ and terminal reviews/audits;
 - Complete integration with ATMS;
- Transportation Compliance Review Process
 - Detailed site compliance reviews every three years;
 - Enhanced sharing best practices and continuous improvement;
- Transcom
 - System transition to Carlsbad;
 - Integration with other Government tracking systems;
- Hazardous Materials Transportation Training
 - Need to re-energize this effort to serve as a resource to all field and HQ personnel via classroom and web-based training;
- Transportation Management Council (TMC)
 - Strongly supported with opportunities for enhanced cooperation/sharing among EM field transportation contractors, EM field federal transportation personnel, and EM headquarters.



Transportation Risk Review Prioritization

Transportation Ranking Factors

- Movement Ranking Factors

- Volume/Year
- Shipments/Year
- Distance/Shipment
- Population

- Hazard Ranking Factors

- LLW/MLLW → 9
- NM/DUF6 → 12
- TRU → 12
- SNF/HLW/SNM → 16

- Prior Year Incident Rates



Transportation Risk Management

Transportation Reviews



- What Are We Doing Now?
- What Could Go Wrong?
- What If It Does?
- What Could We Do Different?



Transportation Risk Management

Transportation Reviews – Areas for Consideration:

- Package Selection & Design
- Material Characterization
- Loading & Securement Procedures
- Pre- and Post-Load Inspections
- Mode
- Carrier
- Route
- Emergency Preparedness



Transportation Risk Reviews

2nd Annual EM Transportation Best Practices Workshop

*April 18 – 20,
Boulder, Colorado*

More info (& free):

www.emtransportation.com



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Transportation Emergency Preparedness & Outreach Support



- Transportation Emergency Response
 - Highly skilled response teams are on call 24/7
- Transportation Emergency Preparedness Program (TEPP)
 - Planning, training, exercises
- Increased dedication to working closely with states and tribes to ensure open and honest dialogue, understanding, and cooperation
 - Commodity flow surveys, TransCAER workshops, and Regional state cooperative organizations





Transportation Emergency Preparedness Program (TEPP)

Modular Emergency Response Radiological Transportation Training (MERRTT) Courses

DOE Shipments and Resources

Biological Effects

Initial Response Actions

Patient Handling

Radiological Terminology and Units

Assessing Package Integrity

Waste Isolation Pilot Plants

Transportation by Rail

Transportation of Safeguards Material

Pre-Hospital Practices

Incident Command

Public Information Officer

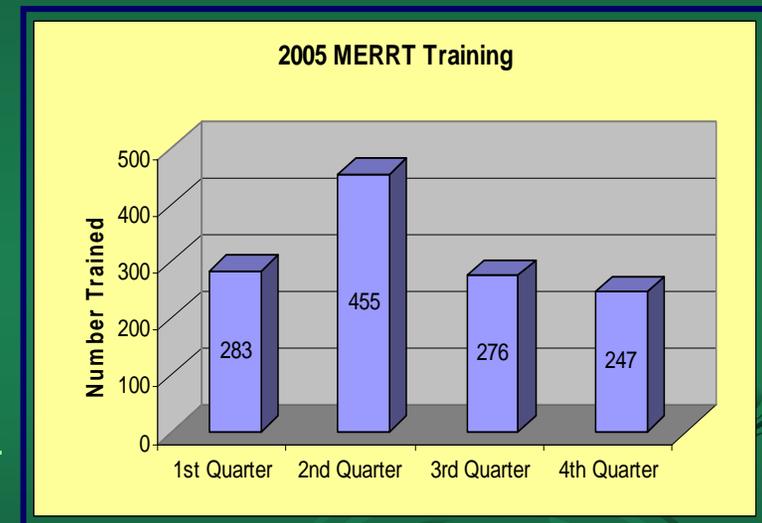
Decontamination, Disposal and Documentation

Radiological Basics

Radioactive Material Shipping Package

Radiological Survey Instruments and Dosimetry Devices

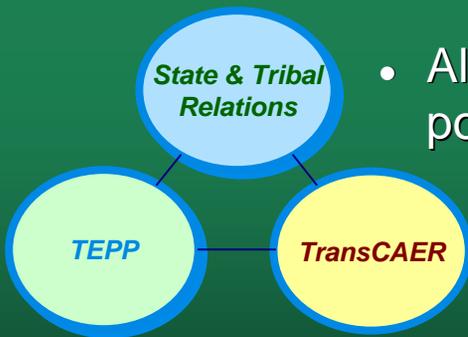
Hazard Recognition
Incident Control



EM Transportation Emergency Preparedness & Outreach Support

➤ Commodity Flow Surveys

- Conducted along EM Transportation Highway and Rail Routes
 - Provide local communities information on types, volumes, and frequencies of hazardous materials transported through counties/cities
- Allow local fire, LEPCs, and police to better prepare for potential transportation incident response.



EM Transportation Emergency Preparedness & Outreach Support

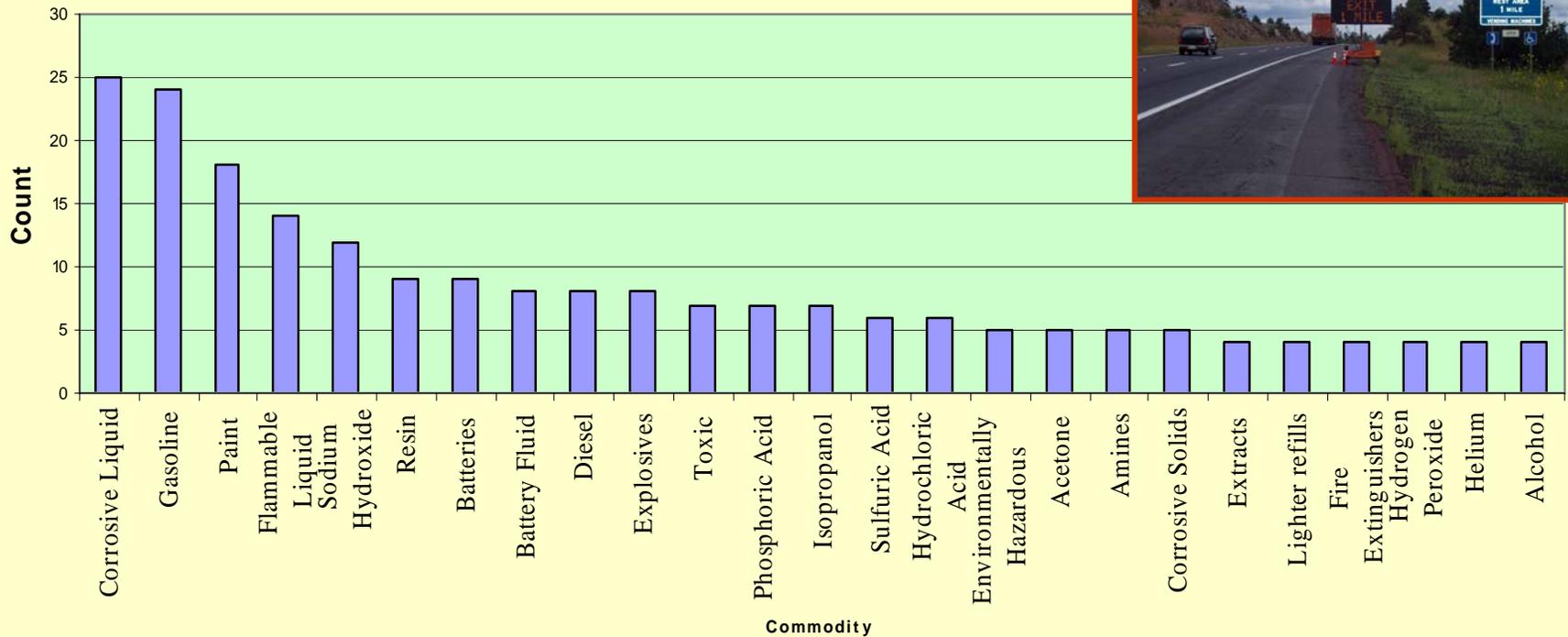
Flagstaff Commodity Flow Survey

- Date: August 10-11, 2005
- Location: In Northern Arizona along Interstate 40 at Parks Rest Area (12 Miles West of Flagstaff)
- Duration: 24-Hours (9:00am August 10 to 9am August 11)
- Participants included Arizona DOT, Flagstaff Fire Department, and DOE
- 206 HAZMAT Vehicles were recorded during the Survey (133 Westbound and 73 Eastbound) carrying 362 Commodities



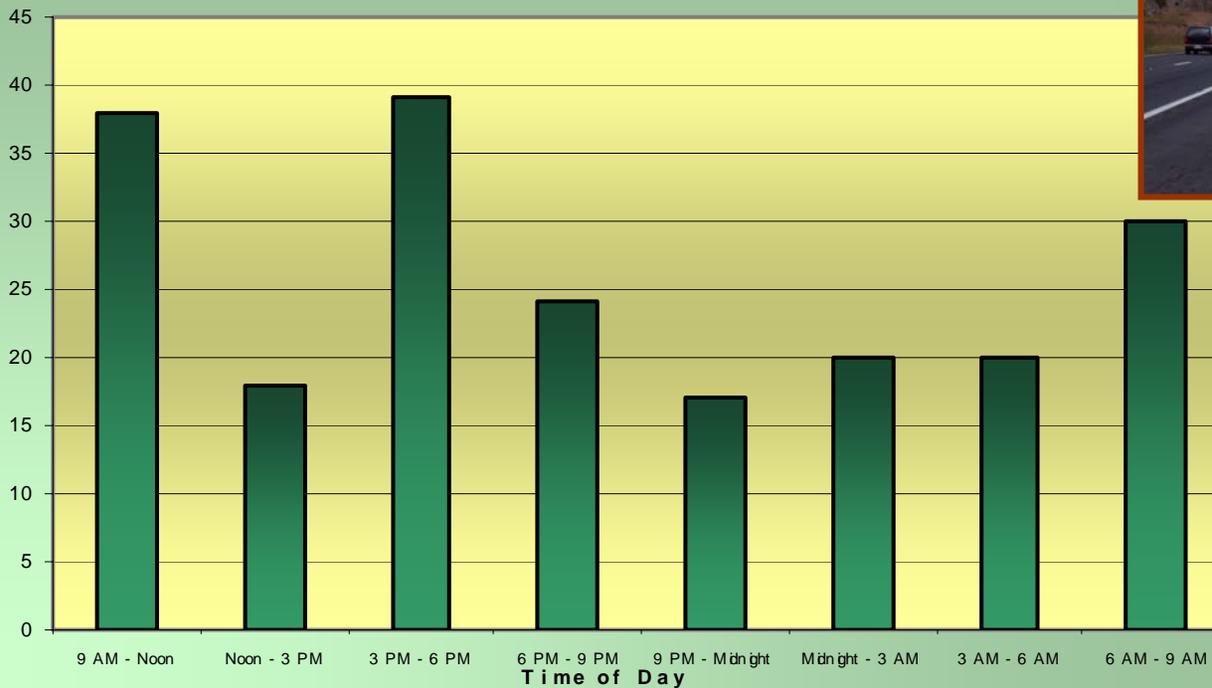
Flagstaff Commodity Flow Survey

Top 25 Commodities by Count



Flagstaff Commodity Flow Survey

24-Hour Flagstaff HazMat Truck Transportation



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Flagstaff Commodity Flow Survey

Time	Trailer Type	Direction	Trailer Placard	Hazard Class	Material ID	Material PSN	ERG Guide Number	Quantity (lbs)
9:00	Van	East	9	Miscellaneous	3082	Environmentally Hazardous Substance	171	
9:10	MC306	West	3	Flammable Liquid	1863	Fuel, aviation, turbine engine	128	63,000
9:15	MC331	West	2.1	Flammable Gas	1075	Propane	115	41,200
9:25	MC306	West	3	Flammable Liquid	1203	Gasoline	128	54,000
9:30	Van	East	9	Miscellaneous	3077	Environmentally Hazardous Substance	171	
9:37	MC331	West	2.1	Flammable Gas	1075	Propane	115	41,200
9:40	MC306	West	3	Flammable Liquid	1863	Fuel, aviation, turbine engine	128	63,000
9:44	MC312	East	8	Corrosive	1791	Hypochlorite solution	154	45,850
9:45	MC306	East	3	Flammable Liquid	1203	Gasoline	128	54,000
9:50	Van	West	3	Flammable Liquid	1263	Paint (flammable)	128	2,300
9:55	Van	East	4.1	Flammable Solid	3175	Solids containing flammable liquid, NOS	133	
10:00	MC306	West	3	Flammable Liquid	1203	Gasoline	128	54,000
10:05	Van	West	8	Corrosive	2817	Ammonium hydrogendifluoride, solution	154	172
10:05	Van	West	6.1	Toxic	2810	Toxic Liquid, NOS	153	520
10:15	Van	West	8	Corrosive	3260	Corrosive, solid, acidic, inorganic, NOS	154	
10:30	MC406	East	3	Flammable Liquid	1203	Gasoline	128	54,000
10:35	Van	West	8	Corrosive	2794	Batteries, wet, filled with acid	154	3,570
10:35	Van	West	3	Flammable Liquid	1993	Flammable liquid, NOS	128	500
10:35	Van	West	9	Miscellaneous	3268	Air bag modules	171	51
10:45	Van	West	3	Flammable Liquid	1993	Flammable liquid, NOS	128	8,000
10:46	Van	West	8	Corrosive	3266	Corrosive liquid, basic, inorganic, NOS	154	



EM is Committed to Tracking and Communicating our Transportation Performance

- Key Performance Metric: Transportation Incidents/10,000 Shipments

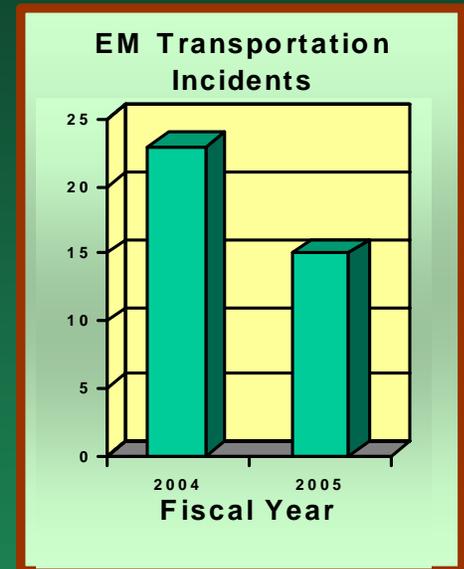
- EM transportation incident criteria:
 - Any release of an EM material during transportation,
 - Any injury (either outpatient, first aide, minor injury, hospitalization, or fatality)
 - Any damage to the transport vehicle or package
 - Any fines or regulatory violations
 - Any package damage or load securement problem
 - Any route deviation (for Transcom monitored shipments) or security breach
 - Any road closure or public evacuation
 - Any local or national media coverage



EM Achieves >30% Reduction in Transportation Incidents!!!!

FY 2004 Transportation Incidents:

- In FY 2004, EM had 23 reported off-site incidents.
 - Most significant incident was the release of radioactive material onto road surfaces at Oak Ridge
 - Other areas of concern -- load securement and shipping paper violations
- FY 2004 Incident Rate = $23/2.0 = 11.5$ Incidents/10,000 Shipments

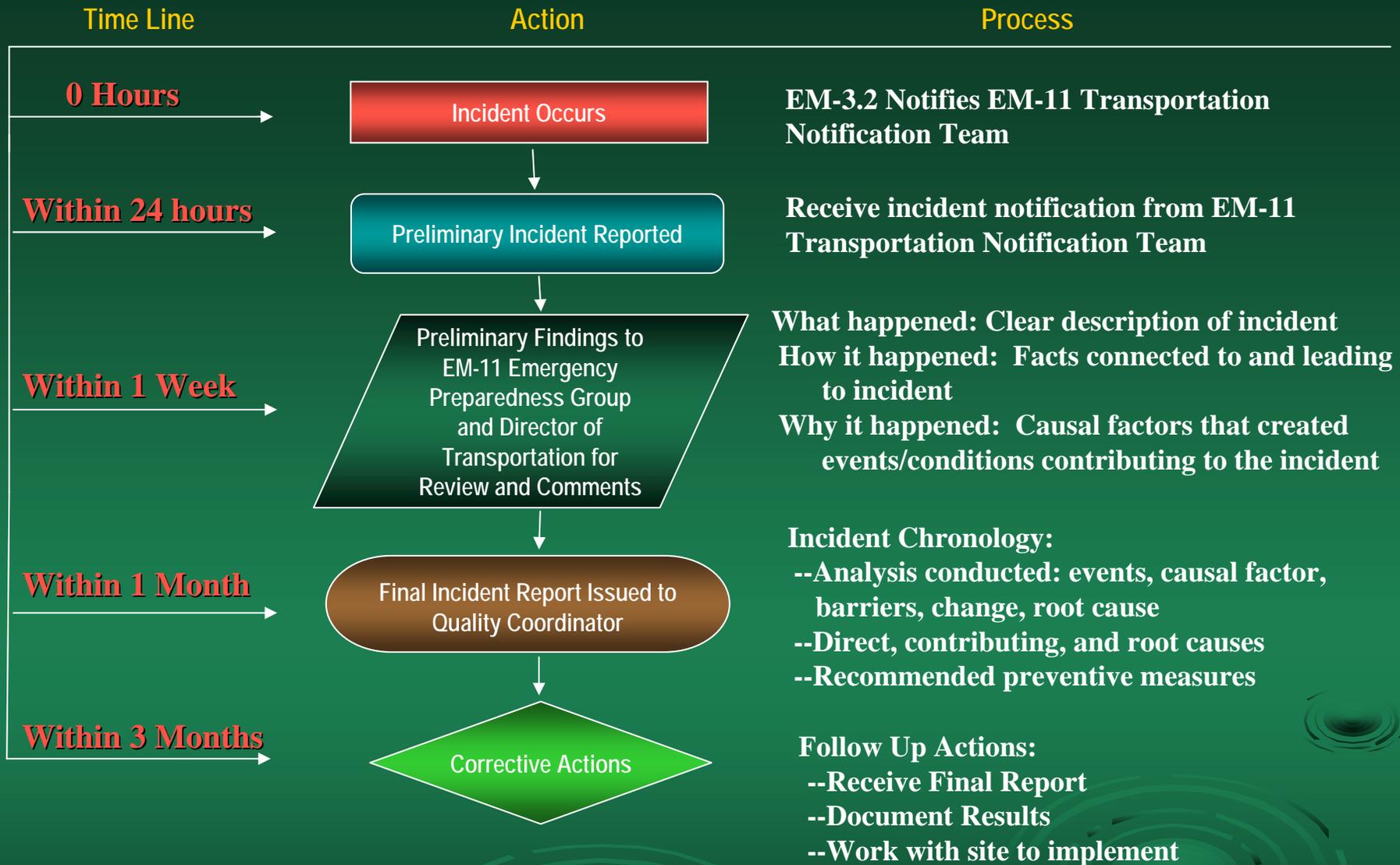


FY 2005 Transportation Incidents:

- In FY 2005, EM had 16 reported off-site incidents.
 - Most significant incident was rain water in BNL railcar
- FY 2005 Incident Rate = $16/2.0 = 8$ Incidents/10,000 Shipments



Transportation Post-Incident Investigation/Analysis



We are Striving to become Best in Class

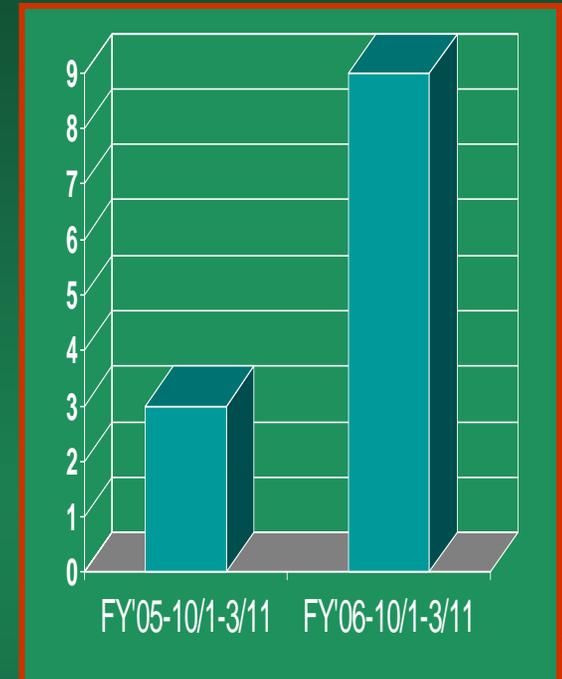
- Incident Data Will Tell Us How!

- In FY 2005 year to date, EM had 16 reported incidents representing a 30% reduction from the same period in FY2004. FY 2006 incidents:
 - 10/9/05 – (Fernald-WCS) Emergency response telephone number on shipping papers not answered
 - 10/19/05 – (OR – Portsmouth) DUF6 truck side-swiped by pedestrian vehicle, no injuries and minor damage to truck/trailer
 - 10/30/05 – (WVDP – NTS) LLW truck driver issue citation for not stopping following blown trailer tire
 - 11/8/05 – (WVDP – Envirocare) Vandalism of rail car tie-down mechanisms on lids to 3 sealand cargo containers
 - 12/7/05 – (LANL - WIPP) Collision with Ford Truck at intersection in Los Alamos, NM. No damage to TRU containers.
 - 12/8/05 – (FCL – WCS) Pickup truck hit pedestrian car pushing car into Silo 1/2 trailer in route to WCS. Snowy conditions in Effingham, IL. Flat trailer tire.



We are Striving to become Best in Class - Incident Data Will Tell Us How!

- 12/27/05 (WIPP) – WIPP truck pulling three empty TRUPACT-II packages left the road on I-15 near Blackfoot, ID. All three packages came off the trailer.
- 1/3/06 (FCP – WCS) – Truck transporting Silos 1&2 material struck a deer on SR 128 in Miamitown, OH. No injury, no damage (except to the deer!)
- 1/27/06 (ID – Envirocare) – 100 gallon Transuranic Waste drum destined for WIPP accidentally sent to Envirocare. Material returned to ID. Incident under investigation.



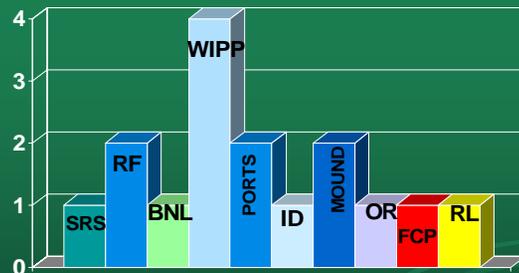
Many Opportunities for Future Reductions

A 30% Reduction in 2005 was Excellent

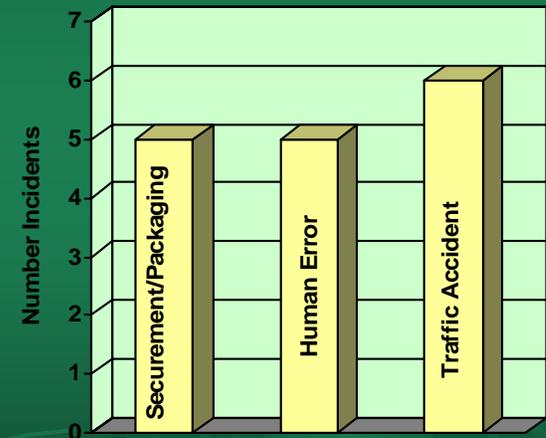
▶ Many opportunities for further incident reductions in 2006

▶ Area of Focus for 2006 –
Elimination of Human Errors

FY'05 Incidents



FY'05 EM Transportation Incident Categories



Last Minute Stuff!!

- Next EM Commodity Flow Survey – March 12th, Louisiana/Texas I-20 border
- State Fees for LLW Shipments
- UNLVRF LLW Tracking Study
- EM Office of Transportation Web Site online:
<http://web.em.doe.gov/otem/>.
- EM Transportation Best Practices Workshop – April 18-20, Boulder, Colorado www.emtransportation.com



And Finally!!

- The true measure of our success will be directly related to the number of transportation incidents we have.
- Human Error is a major cause of all transportation incidents.
- We must never transport a material if there is any question about the classification of the material being shipped, the quality of the container, or the safety commitment of the carrier and/or driver being used.
- There is significant transportation expertise throughout EM sites. Communication of experiences and best practices widely is a critical component of our future success.
- We are proud of our accomplishments but are always striving for continuous improvement for the benefit of the public and the environment.



Thank you for the opportunity to speak with you!

Director

➤ **Dennis Ashworth** **202-586-8548** Dennis.Ashworth@HQ.DOE.GOV

Distribution Risk Reduction & Site Support

➤ **Eric Huang** **301-903-4630** Eric.Huang@HQ.DOE.GOV
➤ **Kriss Grisham** **301-903-8478** Kriss.Grisham@HQ.DOE.GOV
➤ **Ed Wade** **301-903-7207** Ed.Wade@HQ.DOE.GOV

Transportation Regulatory Support

➤ **Ashok Kapoor** **202-586-0991** Ashok.Kapoor@HQ.DOE.GOV
➤ **Dottie Brown** **301-903-4925** Dorothy.Brown@HQ.DOE.GOV

Emergency Preparedness, Security & Outreach

➤ **Ella McNeil** **301-903-7284** Ella.Mcneil@HQ.DOE.GOV
➤ **Bill Spurgeon** **301-903-8187** William.Spurgeon@HQ.DOE.GOV
➤ **Catherine Volk** **301-903-2920** Catherine.Volk@HQ.DOE.GOV

