



ROUTING ISSUES RELATED TO
U.S. DEPARTMENT OF ENERGY
RADIOACTIVE MATERIALS TRANSPORTATION:
DISCUSSION AND RECOMMENDATIONS

PREPARED BY THE

ROUTING TOPIC GROUP

OF THE

TRANSPORTATION EXTERNAL COORDINATION
WORKING GROUP

APRIL 1998

**Routing Issues Related to U.S. Department of Energy
Radioactive Materials Transportation: Discussion and Recommendations**

Table of Contents

I. Introduction 1

II. Assumptions for Planning Purposes..... 1

III. The Current Routing Regulatory Structure and Its Implications..... 3

IV. DOE Policy, Plans, and Responsibilities..... 6

V. State Involvement in and Perspectives on Route Selection 9

VI. Tribal Authority, Issues, and Perspectives 11

VII. The Role of Local Governments in Determining Preferred Routes 12

VIII. Routing Issues of Importance to Environmental Groups 14

IX. TEC/WG Stakeholder Recommendations to DOE Regarding Routing..... 15

Appendix A: References

Appendix B: Routing Topic Group Participants

I. Introduction

Of all the complex issues surrounding the transportation of radioactive materials, perhaps none is more often fraught with controversy than routing of the shipments. Whether transported by rail, highway, or barge, the shipment of radioactive materials presents unique planning, operational, and emergency response requirements for officials of federal, state, tribal, and local governments. Environmental, professional, and industry organizations, as well as interested members of the general public, also have concerns and consistently place great importance on ensuring the validity of the decision-making process and the eventual safe transportation of radioactive materials.

The U.S. Department of Energy (DOE) established the Transportation External Coordination Working Group, or TEC/WG, in 1992 in an effort to bring together representatives of organizations concerned about routine transport and emergency response issues related to radioactive materials shipments. At semiannual meetings, TEC/WG participants learn about current and future DOE transportation plans, identify issues of concern to their constituents, and suggest approaches that the Department could take to address those concerns. The TEC/WG has formed smaller topic groups to discuss particular issues, and in 1996 a Routing Topic Group began to address the routing issue in detail.

This Discussion Paper is the result of a series of conference calls and face-to-face meetings involving members of the TEC/WG Routing Topic Group. The paper is intended to help TEC/WG members, DOE managers, and others understand the importance of route identification to stakeholders and the need for full and open discussion concerning routing decisions. TEC/WG member organizations will continue to have divergent opinions on routing issues; this paper contains some of those viewpoints. However, this paper should help identify where shared perspectives exist and where further discussion and negotiations are needed. Reference materials and other informational resources related to routing are listed in Appendix A. TEC/WG participants who contributed to the paper are listed in Appendix B, along with their organizational affiliations.

For further information on the Routing Topic Group, or to obtain additional copies of this paper, please contact Alex Thrower of the Urban Energy & Transportation Corporation (UETC) on (505) 260-2308 or via electronic mail: at_uetc@earthlink.net. The paper is also available on TEC/WG's World Wide Web page at <http://www.uetc.org/tec>.

II. Assumptions for Planning Purposes

The following planning assumptions address programmatic, regulatory, institutional, and operational considerations that can influence DOE routing decisions and associated transportation planning. These assumptions may be generally applicable to many aspects of transportation planning, but they have significant direct consequences for routing as well.

Programmatic Assumptions: this analysis assumes that disposal facilities will be sited and become operational in the near future; i.e., sites like the Waste Isolation Pilot Plant (WIPP) will become operational, and shipping to this site as well as accelerated cleanup at other DOE sites will dramatically increase numbers of radioactive materials shipments. Similarly, DOE will site and operate either a permanent disposal or a temporary storage facility for commercial spent nuclear fuel. Shipments to either type of facility will significantly increase the total number of DOE shipments. Finally, receipt of foreign research reactor spent nuclear fuel will proceed in accordance with DOE's current plans. Over the next decade, shipments of this spent fuel will arrive at Charleston Naval Weapons Station in South Carolina and Concord Naval Weapons Station in California and be temporarily stored at two sites, the Idaho National Engineering and Environmental Laboratory (INEEL) and the Savannah River Site (SRS) in South Carolina. Transshipping of spent nuclear fuel will occur between INEEL and SRS over the same time period. Some spent fuel generated in the weapons production process also will be shipped from the Hanford Site in Washington State to SRS, and domestic university and research reactors will send fuel to INEEL and SRS.

Institutional Assumptions: public interest in radioactive materials transportation will remain high. Past shipping campaigns have shown that the environmental community and the public at large consider transportation a key issue in safe waste management and cleanup. Traffic of radioactive materials in the general stream of commerce, particularly those shipments perceived to present a high hazard, will continue to be highly visible and newsworthy. Public perceptions of the responsibilities and competence of government officials will continue to influence planning and operations activities at all levels.

Regulatory Assumptions: The Department of Transportation (DOT) and the Nuclear Regulatory Commission (NRC) regulations governing radioactive materials transportation safety and safeguards will remain largely unchanged. State regulation of radioactive materials transportation—in the form of fees, designated alternate routes, or notification requirements—is likely to increase. While some regulations and associated guidance may change as a result of reauthorization of the hazardous materials transportation law, the basic regulatory structure will continue as it now exists. No significant changes are anticipated in DOT regulations governing highway route selection. Proposed new DOT rail routing guidelines are unlikely to change current carrier preferences even if enacted by Congress. NRC's oversight of DOE packaging and transportation activities will increase over time. The scope of DOE activities exempt from NRC regulation (for purposes of national security) has shrunk considerably in recent years, and DOE and the NRC have agreed in principle to end DOE's self-regulation over a phased period.

Operational Assumptions: DOE increasingly will rely on market-based initiatives to improve the efficiency and reduce the costs of its transportation activities. DOE programs, including WIPP and the Civilian Radioactive Waste Management System (CRWMS), are examining a variety of options to employ market incentives to improve their performance. While DOE as a shipper will continue to be involved in identifying routes with involved parties, day-to-day transport operations may become more

decentralized and contract-based than they have been in the past. In addition, highway and rail will continue to be the primary shipment modes, although barging will remain an option for some DOE shipments.

III. The Current Routing Regulatory Structure and Its Implementation

The two most common modes of transportation for highly radioactive materials are highway and rail, although barge transport occurs infrequently. The regulatory structures governing each mode are quite different due to major differences in infrastructure, the fact that highways are publicly and railroads privately owned, and other operational factors. The different structures are described separately below.

Highway Routing

DOT's Federal Highway Administration (FHWA), Office of Motor Carriers, HSA-10, regulates the highway routing of hazardous materials, including radioactive materials currently covered under 49 CFR 397.101.¹ Highway routing regulations apply to highway route controlled quantity (HRCQ) materials, as defined in 49 CFR 173.403. Examples of HRCQ materials include spent nuclear fuel and irradiation sources such as cesium-137 capsules or cobalt-60 emitters. Some DOE shipments of transuranic waste will be routed as HRCQ materials, even though technically below the regulatory threshold. DOT hazardous materials regulations govern DOE low-level and mixed waste shipments.

Highway carriers of HRCQ materials are required to use preferred routes² in transporting their cargoes. Deviations from preferred routes (for pickup or delivery, or because of needed repairs) must minimize radiological risk to the public.³ When deviating from preferred routes, the carrier must also consider available information on accident rates, transit time, population density and activities, and the time of day and day of week during which transportation will occur.⁴ Persons commenting upon the rulemaking governing HRCQ routing, Docket HM-164, had suggested that DOT consider additional factors—including terrain, physical features, weather conditions, and effectiveness of local emergency planning.⁵ DOT excluded terrain and physical features from the final rule on the grounds that, since they already contributed to overall highway accident rates, including them as criteria would effectively “double-count” them.⁶ DOT also pointed out that local weather conditions were difficult to predict and “could often change during

¹ See also U.S. Department of Transportation, “Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Material” (hereinafter referred to as DOT Guidelines), No. DOT/RSPA/HMS/92-02 (Aug. 1992), at iv.

² A preferred route is an “Interstate System highway for which an alternate route is not designated by a State routing agency; a State-designated route selected by a State routing agency pursuant to §397.03; or both of the above.” 49 CFR 397.101(b)(1).

³ 49 CFR 397.101.

⁴ Ibid.

⁵ 46 F.R. 5298 at 5308.

⁶ Ibid.

transportation.”⁷ Local response capability should not be a factor, DOT said, because “effective emergency response planning is an activity that all communities should be involved with” and because DOT and the Federal Emergency Management Agency (FEMA) were preparing a program to achieve community preparedness.⁸

In addition to using state-designated preferred routes or interstate highways, HM-164 requires the use of beltways around metropolitan areas where they are available. DOT recognized that in some cases beltways might have higher accident rates or population exposures; however, it determined that states were best positioned to make those determinations by designating alternate routes where needed.⁹

State routing agencies may designate preferred routes as an alternative to, or in addition to, one or more interstate highways, including beltways or bypasses.¹⁰ In making such designations, states must select routes that “minimize radiological risk” based on DOT’s own recommended set of factors (see insert) or an equivalent routing analysis. States must also consult with local jurisdictions and other states that may be affected “to ensure consideration of all impacts and continuity of designated routes.”¹¹ State-designated routes become official once they are filed with the DOT. To date, 10 states have designated alternate preferred routes: Alabama, Arkansas, California, Colorado, Iowa, Kentucky, Nebraska, New Mexico, Tennessee, and Virginia. The regulations provide that highway routing designations made by a state or tribal routing agency are preempted if compliance with both the highway routing designation and any requirement under the federal law is not possible, or if the routing designation as applied creates an obstacle to the accomplishment and execution of the federal law.¹² DOT’s Federal Highways Administration (FHWA) is authorized to conduct administrative hearings called preemption determinations when any person formally requests one. FHWA can also issue waivers of preemption determinations.

HM-164 primary factors in designating preferred routes include:

- radiation exposure from normal transport*
- public health risk from accidental release of radioactive materials*
- economic risk from accidental release of radioactive materials.*

HM-164 secondary factors include:

- emergency response effectiveness*
- evacuation capabilities*
- location of special facilities such as schools or hospitals*
- traffic fatalities and injuries unrelated to the radioactive nature of the cargo*

⁷ Ibid.

⁸ Editor’s Note: reviewers representing local governments stated repeatedly that such programs have not, to date, achieved what they consider to be adequate community emergency preparedness.

⁹ 46 F.R. 5298 at 5308.

¹⁰ 49 CFR 397.103(b).

¹¹ 49 CFR 397.103(a).

¹² 49 CFR 397.203

The carrier is responsible for preparing a route plan in compliance with 49 CFR 397.101(d); however, DOT contemplated that shippers would have a significant role to play:

Certainly DOT recognizes the interest of shippers in routing decisions and expects that *they will be very influential in the final selection*. However, carriers remain the party with ultimate responsibility for compliance with [the routing regulations] and they are cautioned to carefully evaluate any route plan submitted for their adoption by other parties (emphasis supplied).¹³

Following the development of the route plan, the shipper submits the plan to the NRC for approval. Drivers using the route plan are not permitted to deviate from the route plan unless they must to obtain fuel, repairs, rest, or to avoid adverse road conditions.

Rail Routing

Rail routing of large quantity radioactive materials such as spent fuel is treated differently from highway routing from a regulatory standpoint. Regulations like those for truck shipments do not exist for rail transport; instead, a shipper and rail carrier normally jointly plan the route considering such factors as starting and ending points, the shortest distance/time in transit, and (if needed) bridge conditions relative to the weight of the shipment load.

Over the past two decades, stakeholders have proposed that DOT promulgate rail routing guidelines similar to the highway regulations in HM-164 to eliminate or reduce rail shipments of radioactive materials through highly populated areas. DOT has shown little interest in promulgating rail routing guidelines, and the railroad industry is strongly opposed to new routing regulations. Rail industry representatives point out that there are few realistic alternatives to shipping through major urban areas because the highest quality tracks and signal systems serve the high-density rail traffic between major cities, because key carrier interchange points are located in major cities, and because widespread rail abandonment has reduced routing options generally. Proposed legislation would require DOT to promulgate rail routing guidelines for spent fuel and high-level waste shipments. It is unclear how or whether such legislation might change current carrier routing preferences.

Although they are not required to have their plans reviewed by the Federal Railroad Administration (FRA), some shippers, including some DOE shippers, as a matter of practice request that FRA inspect the rail route for operational safety and safeguards review. The shipper is required to send the rail plan to the NRC, which (as it does for highway) examines physical security considerations. Railroads have used special trains for

¹³ 46 F.R. 5298 at 5310. The NRC also has oversight over routes to the extent that route selection may impact upon its physical security requirements.

selected shipments that employ additional operational requirements; however, these specific requirements generally do not themselves affect routing of the shipments.

Safeguards Routing Regulations

The NRC has established a system of physical protection requirements for shipments of spent nuclear fuel and high-level radioactive waste. As part of this system, which is designed to reduce the risk of radiological sabotage or diversion of weapons-grade nuclear materials, NRC staff review proposed routes prior to commencement of shipments. The NRC regulations incorporate DOT's transportation rules; the NRC enforces the DOT regulations and its own simultaneously.

The NRC has identified five types of route characteristics that receive special consideration when NRC staff review routes for approval pursuant to 10 CFR 73: (1) routes through highly populated areas; (2) routes that would place the shipment or escort vehicle in a significantly disadvantageous position (for example, tunnels which would prevent the escort vehicle from maintaining continuous surveillance of the shipment vehicle); (3) routes with marginal safety design features (for example, two-lane routes or absence of guard rails); (4) routes with limited rest and refueling locations; and (5) routes where responses by local law enforcement agencies, when requested, would not be swift or timely.

IV. DOE Policy, Plans, and Responsibilities

DOE's energy research and environmental cleanup missions require the transportation of large amounts of radioactive materials. In FY 1995, DOE shipped 6,878 shipment of radioactive materials compared to a total of 2.8 million radioactive materials shipments in the United States. Over the next several years, and continuing over the next four decades, DOE radioactive materials shipments, and DOE's share of total radioactive materials shipments nationally, will increase dramatically as a result of weapons complex cleanup activities and storage/disposal of spent reactor fuel and high-level wastes. Annual numbers of shipments could increase to over four times current levels. Because DOE will become an increasingly significant shipper of radioactive materials, the Department has special responsibilities to ensure that transportation operations, including routing, are done in full compliance with regulations and with the informed knowledge of the interested public.

As a shipper, DOE considers routing an important logistical aspect of routine transportation planning and operations. Information and program requirements can impact scheduling of shipments, the mode (highway or rail) chosen, numbers of shipments, availability of appropriate packagings, and other "decision points" that can directly affect routing determinations.

With regard to highway transport of HRCQ materials, DOE's position has been that the carrier ultimately is responsible for selecting the route. However, in recent campaigns DOE has worked closely with the carrier and other federal, state, tribal, and local

authorities in early identification of potential routes. Routing determinations are critically important to the Department, and as a matter of course DOE consults (as HM-164 contemplated it would) closely with the carrier and affected states in making the final selection. In cases of shipping campaigns where multiple shipments over an extended period of time are scheduled, DOE has often undertaken a “representative route identification” process using its analytical routing tools such as the HIGHWAY and, for rail transport, INTERLINE programs. The purpose of this route identification is not to dictate to the carrier which route it must use, but to help DOE fulfill its requirements under the National Environmental Policy Act¹⁴ and to help it facilitate planning in conjunction with affected state, local, and tribal authorities.

Some DOE programs work with rail carriers of spent nuclear fuel and other large quantity radioactive materials shipments to ensure that shipments are routed safely. In the past, DOE has required its rail carriers to (1) minimize time, distance, the number of carriers, and interchanges along the route; (2) use the best track class available for speed and safety; (3) use routes where public exposure to the shipment is minimized; (4) produce rail-routing printouts to help DOE to consider alternative routes; and (5) schedule shipments through populated areas during off-peak commuter hours.¹⁵

Although DOE managers recognize the importance of informing and involving stakeholders in decisions about transportation, there are aspects of routing that can generate unease for managers concerned about cost, scheduling, and efficiency issues. DOE officials have pointed out that the regulatory scheme governing transportation of radioactive materials (particularly HRCQ shipments) is a particularly complex one, one that was achieved after years of formal rulemaking and commenting by hundreds of shippers, carriers, state, local, and tribal officials, and environmental groups. Some of the extra-regulatory requests made by stakeholders today were considered and rejected by the DOT when it promulgated HM-164 in 1981, usually because the benefits conferred did not at that time appear to justify the added cost or administrative burden on the regulated community.

¹⁴ NEPA requires DOE and other federal agencies to examine the environmental impacts of all “major federal actions.” Such examinations must include analysis of transportation impacts, which may include (but are not limited to) factors such as: (1) potential effects of transportation on-site and en route; (2) effects from routine transport as well as any reasonably foreseeable accidents; and (3) accuracy of estimation methods of radiological impacts. Computer models like RADTRAN are used to estimate potential effects along transportation routes. See DOE Office of Safety and Health, “Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements”, at 25. See also The National Environmental Policy Act of 1969, Pub. L. 91-190, 42 USC 4321-4347 (Jan. 1, 1970, as amended).

¹⁵ Because of infrastructure and programmatic limitations, not all listed criteria have been used for every DOE rail shipment. Please see memorandum from Lawrence H. Harmon, U.S. Department of Energy, “Current Recommended Practice for DOE Rail Routing of Unclassified Spent Nuclear Fuel and High-Level Waste,” Aug. 29, 1988. See also R. C. Schmitt, G. J. Quinn and M.J. Tyacke, Idaho National Engineering Laboratory, “Historical Summary of the Three Mile Island Unit 2 Core Debris Transportation Campaign,” DOE/ID-10400, Mar. 1993.

DOE managers have voiced concerns that these added costs may be passed along to the program (and by extension to taxpayers), which may not have budgeted for such unanticipated costs. Moreover, these kinds of additional costs have had a tendency to perpetuate themselves to the extent that they set precedents for other future DOE shipping campaigns. The WIPP transportation program, for example, has made many extra-regulatory commitments in response to the Western states' concerns over transuranic waste shipments. Because of the publicity surrounding the WIPP program, other states and stakeholders have cited the WIPP transportation planning process—including route identification—as the model for other high-visibility transportation programs (see Section V for more information). Where it can be shown that significant above-regulatory safety and operational benefits can be achieved at relatively low cost, managers have been more willing to commit to them.

Different DOE programs are examining market-based incentives to improve efficiencies and control operating costs. Some proposals envision the use of fixed-price (as opposed to “cost-plus-fee-award”) contracts to reduce cost uncertainty and to give contractors incentives to conserve funds. DOE program managers have raised concerns that transportation contractor cost control incentives could be greatly reduced if unanticipated stakeholder demands for extra-regulatory safety measures were to inflate the cost of performance. DOE program managers and contractors have also pointed out that some agreed-upon above-regulatory requirements may neither result in an actual increase in safety nor achieve stakeholder acceptance of shipment campaigns.

DOE has employed mechanisms both within and outside the Department to coordinate decisions about routing and other logistical issues with potential political and institutional impacts. The Senior Executive Transportation Forum coordinates activities and plans of major programs with transportation elements to ensure that decisions are made consistently across the Department. The Transportation External Coordination Working Group (described in the introduction) is the formal mechanism by which DOE receives input on technical aspects of issues like routing. Regional state associations and tribes have also participated in transportation planning, including resolution of inter-state routing issues.

Stakeholder input on routing through the TEC/WG and other mechanisms is contemplated in *Accelerating Cleanup: Paths to Closure*, which was released in February 1998. This document articulates the vision for cleaning up many DOE Environmental Management (EM) sites within ten years, and was developed in collaboration with state governments, tribal nations, regulators, and stakeholders. DOE's National Transportation Program has developed a three-tiered system to identify the transportation issues related to cleanup plan decisions, including those related to routing. DOE will develop transportation plans for different material types and waste streams covered under the strategic cleanup plan, and will do so in cooperation with states, tribes, and localities along the contemplated routes. These plans will include detailed discussions about routing issues and will be developed in accordance with DOE's *Program Managers' Guide to Transportation Planning*. In addition, the Secretary has directed DOE's Senior Executive Transportation

Forum to develop protocols for all DOE programs with significant transportation activities; routing is one of the issues being addressed.

DOE has applied the experiences from several shipping campaigns in planning future shipments of spent fuel and other radioactive materials. A primary example of how DOE has worked with the states is presented in the case of the urgent relief acceptance of foreign research reactor spent nuclear fuel at the Savannah River Site in 1995. During planning for that campaign, the Department interacted extensively with the states. Activities included discussions on rail and later plans for potential truck shipments. In one instance, the identified route had a higher-than-expected accident rate, and the state wanted the shipments to use an alternate route. The alternate route, however, would have required the state to employ the formal route-designation process as outlined in HM-164. Due to time and budget constraints, the state routing agency did not want to undergo the formal process. As a compromise, DOE proposed an alternative route that used another state highway, which the state accepted. The route was consistent with the DOT requirements because it met the test that allows flexibility for routing. This early identification and consultation about representative routes in the planning process helped to avoid potential problems.

V. State Involvement in and Perspectives on Route Selection

The states' interest in route selection for radioactive materials shipments derives from their responsibility to protect public health and welfare, as well as property, from the possibility and effects of accidents. This responsibility exists regardless of whether there are few or many shipments, and regardless of the mode. Therefore, states have an interest on behalf of their citizens to become involved in route selection for all types and modes of radioactive materials shipments.

The states believe that DOE, as a major shipper of radioactive materials, should play a central role in the selection of routes for specific shipping campaigns. Under current regulations, large numbers of highway routes and virtually all rail routes could be used for radioactive materials shipments. By narrowing the number of acceptable routes, DOE would make it possible for states to make the most out of the scarce training resources which are available.

Although states have no formal role in rail routing, they do have limited authority for designating highway routes for shipments of radioactive materials (see Section III on page 9). This authority, however, is limited to selecting intrastate alternate routes; there is no formal process for making routing decisions on a regional level. As DOT acknowledged, the state governments are in a better position than either the federal or local governments to consider the overall safety impacts of routing decisions. For this reason, DOT invested states with the authority to designate alternate highway routes. Designating such routes is

one way for states to ensure that shipments of radioactive materials travel on the safest highways.¹⁶

Route designations that have occurred have required lengthy and often contentious public hearings, highly complex (and occasionally diversionary) technical debates over allocating weight to various risk factors, and considerable use of staff time for evaluation and analysis. Industry opposition to additional regulation, combined with conflicts between state, local, and tribal governments, further complicate the task of alternate route designation. Moreover, alternate route designation in one state can seriously impact (or even eliminate) routing options in adjacent states, and may influence routing options as far as three or four corridor states away. Despite its inherent technical and political complexity, however, members of the Routing Topic Group believe that state designation of alternate highway routes is an important risk management tool.

Many states have suggested that the routes for shipments of high-level radioactive materials should take into consideration critical safety factors not included explicitly in DOT regulations, such as: minimizing emergency response time; the ability to retrieve casks in the event of an accident; avoiding difficult-to-evacuate populations; minimizing transit through inclement weather; avoiding “high hazards;” and imposing time-of-day travel restrictions. Consideration of these factors would involve either amending DOT regulations (advocated by some states) or a commitment from DOE to employ extra-regulatory measures in selecting the routes for particular shipping campaigns.

From the states’ perspective, the ideal route selection process would achieve three main goals:

1. Promote safety and public acceptance of the shipping routes by making the federal government, not a private company, accountable for route selection;
2. Allow resources (inspections, emergency response, etc.) to be focused by reducing the total number of potential routes; and
3. Give states and communities sufficient time to prepare for shipments by eliminating the uncertainty regarding which routes will be used.

The Waste Isolation Pilot Plant (WIPP) program stands as the base model which most states would like to see DOE follow in planning its large scale shipping campaigns that involve high-level radioactive materials.¹⁷ In selecting the routes for the WIPP shipments, DOE’s Carlsbad Area Office proposed a preliminary set of routes to the affected states and then modified the routes based on state suggestions and formal alternate route

¹⁶ Some states have also instituted permitting and fee requirements, as well as inspection programs; these programs, however, are beyond the scope of this paper.

¹⁷ In December 1997, at the Second Joint Meeting of the Regional Radioactive Waste Transportation Committees, five regional cooperative-agreement groups (representing over 40 states) agreed that transportation planning for all DOE programs involving high-visibility radioactive materials shipments should adhere to the WIPP model.

designations. The routes DOE selected in consultation with the carrier, states, tribes and other stakeholders were included as mandatory provisions within the carrier contracts.

This process not only enhanced the safety of the final routes, but it also allowed DOE and the states to target their training resources most effectively. In addition, by involving representatives of the states in selecting the routes, the process negated a potent criticism leveled by opponents of radioactive materials shipments—namely, that the federal government imposed shipping routes without regard for the concerns of the states and their citizens. Many states believe that, if DOE felt it necessary or beneficial to apply such stringent standards to the movement of transuranic waste, it must do the same for other major shipping campaigns radioactive materials.

VI. Tribal Authority, Issues, and Perspectives

In HM-164, DOT stated that for purposes of highway routing, Indian tribes should exercise authority like a state routing agency would. The rulemaking noted that special problems may exist with respect to asserting sovereignty and federal preemption issues:

The source of tribal authority may differ from that of state authority, in that tribal authority is recognized by treaty or Acts of Congress...tribal routing authority may involve a question of the proper relationship between the HTMA and other federal law. In specific situations, it may be necessary to examine other federal law to determine the practical limits on tribal authority to impose [highway] routing controls on vehicles carrying radioactive materials.¹⁸

Proponents of tribal rights contended in the commenting process that “tribes do not lose title to the land on which state or interstate highway right-of-way are obtained through negotiated agreements between the tribes and state governments. Thus, a tribe may not have the authority to preempt such tribal restrictions because the HTMA does not expressly apply to Indian lands.”¹⁹ While DOT recognized the unique nature of the tribal/federal/state relationship, it noted that many tribal reservations are located near nuclear mining or production facilities, and declined to directly address tribal sovereignty in this area except for determining preferred routes. Although DOT has generally recognized tribal authority for routing, it is unclear exactly how a tribal routing agency would go about determining preferred routes. DOE is working with other federal agencies to identify and resolve how tribes will exercise their authority.

To date, no tribe has established a preferred route determination process for HRCQ shipments. Many tribes have law enforcement and emergency response authority within their lands; few, however, have sufficient financial resources to adequately prepare for shipments of hazardous materials, particularly radioactive materials. Although funding from different federal sources—including FEMA, DOT, EPA, and DOE—is available,

¹⁸ 46 F.R. 5298 at 5306.

¹⁹ Ibid at 5310.

funding levels for tribal activities are quite low relative to grants made to states.²⁰ This lack of funding makes all aspects of planning for such shipments more difficult. Cultural considerations for particular lands or land resources are also important to tribal governments; HM-164, however, is silent on the subject of how routing decisions should take such factors into account, although these aspects may be part of the “unique local considerations” referenced in the docket.²¹

Several years ago, the EM program initiated a Notice of Proposed Policy to help define, among other things, what potentially affected tribes near sites and transportation corridors considered important in this area. This approach proved to be particularly difficult to implement, however, and the Department instead established funding mechanisms with tribes that were directly impacted by EM operations.

VII. The Role of Local Governments in Determining Preferred Routes

Under current regulation, local involvement in the routing process is accomplished through consultation with the states. However, HM-164 does not spell out in detail how appropriate consultation with local governments is to be conducted. In enacting the routing rules, DOT stated that “It is recognized that there may be local situations which are so unusual that they cannot be adequately accommodated within the [regulatory] framework. These situations can be called to the attention of the Department through existing administrative channels that may involve either special or general rulemaking.”²²

DOT also sought to strike a balance between decision-making based on local information and the potential for localized opposition to frustrate national objectives:

The Department believes that in the interest of uniformity and safety, it is both appropriate and practical for many routing decisions to be made at the State level. The fifty state governments are in a better position than the federal government to respond to local concerns and likewise are in a better position than the 23,000 or so local jurisdictions to consider overall safety impacts from routing decisions.²³

While this balancing of interests was a good-faith attempt by DOT to ensure that local government concerns are addressed, it is by no means the only way that local jurisdictions may influence the process. For example, a local jurisdiction may work closely with

²⁰ Judith A. Bradbury and Daniel J. Schultheisz, “Financial Assistance to States and Tribes to Support Emergency Preparedness and Response and the Safe Transportation of Hazardous Shipments: 1997 Update”, July 1997 (PNL-10260 Rev. 2), at A-59.

²¹ The federal government is required to consult directly with tribal governments if a federal action will affect or impact a site of historical or cultural significance to a tribe, or a group of tribes, pursuant to current federal law and policy, including the National Historic Preservation Act (NHPA), the Native American Graves Protection and Repatriation Act (NAGPRA), and President Clinton’s Executive Order on Native American sacred sites.

²² 46 F.R. 5298 at 5300.

²³ Ibid at 5300.

representatives of DOE programs to provide information and rationale for its major concerns. This may be accomplished either by the establishment of strong one-to-one relationships with local DOE facilities and/or participation in focused local area working groups.

One example of such a group is the Nevada Test Site Transportation Protocol Working Group that consists of DOE, DOT, private industry, and state, tribal, and local representatives. The group meets regularly to address transportation institutional, modal, routing, and emergency public safety issues. In its brief existence, this group has been influential in providing a forum for local governments and others to participate in DOE and state planning and decision-making regarding radioactive materials transportation. While this group is focused on the transportation of low-level and mixed low-level waste, the institutional processes that have been established provide an excellent guide to interactions regarding a broad range of materials, including high-level waste and spent nuclear fuel. However, if such a group is not feasible, it is incumbent upon local governments to establish and maintain a regular schedule of meetings with nearby DOE facility management and state agencies to stay abreast of developments and provide input to transportation decisions.

DOT also contemplated that much of the data submitted in determining preferred routes would provide opportunities for local input, since information about local facilities, evacuation capabilities and emergency response capacity would be generated by local governments.²⁴ This process is better served, however, when local officials and community members (1) have meaningful input to a routing agency in identifying criteria and recommending priorities for such criteria, (2) are given information on how the data are to be used (i.e., route comparisons, probabilistic risk assessments), and (3) have input on how the results may be presented in a meaningful and understandable manner to decision makers and the public.

Generally, local officials can help make more useful contributions if the routing analyses are of a comparative nature, rather than ones using the traditional probabilistic format. In this type of analysis, routes or segments are compared on variables deemed to be important by local jurisdictions and the routing agency. The results of comparative analyses are meaningful to local officials since they address current conditions and hazards (such as public safety and environmental protection) that may be acted upon by local governments. While latent health effects and long term economic consequences (as determined by probabilistic risk assessment) may be deemed important by local officials, their ability to mitigate these results is questionable and the analyses take on less meaning in their decisions.

Clear guidance for a comparative routing process exists in DOT's *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Material*, No. DOT/ RSPA/HMS/92-02 (Aug. 1992), and in *Highway Routing of Hazardous Materials: Guidelines for Applying Criteria*, No. FHWA/HI/97-

²⁴ Ibid at 5307.

003 (Nov. 1996). Both these documents provide detailed information on how candidate routes may be compared on meaningful criteria while staying within the federal regulatory structure.

In summary, although local governments are lowest in the hierarchy of federal, state, tribal, and local government authority regarding routing of radioactive and hazardous materials, there are effective ways that they may be involved in routing decisions. Within the regulatory structure, they may contribute information and positions regarding use of DOT routing guidelines. In the extra-regulatory realm, they may be proactive in helping to establish regular processes of communication and information exchange with DOE through working groups at various levels and through ongoing one-to-one communication with DOE program or facility managers, especially at the local level.

VIII. Routing Issues of Importance to Environmental Groups

Environmental groups, along with many state, tribal and local officials, want to know how routes were selected to minimize impacts on the human environment (especially as regards densely populated areas). As a result, they have expressed the desire to have a process in place at DOE (for DOE shipments) that gives them an opportunity to have input into specific route selections.

Comments submitted as part of the NEPA decision-making process frequently focus on transportation-related concerns of environmental groups and the public. Typically, commenters on environmental impact statements cite concerns that routes and modes for planned DOE radioactive materials transportation may not accurately reflect actual risk. Some examples of factors cited by DOE's critics include: unique weather patterns or poor road conditions in isolated areas; locations of specialized response personnel and resources; on-site as well as off-site transportation impacts; the effect of exposure to radioactive materials during routine transportation on workers and the public; and specific accident data for selected segments of highways or railroads. Environmental analysts and members of the public continue to disagree as to the most appropriate planning assumptions to use in estimating environmental risk, but many of the assumptions and base cases have important ramifications for future routing of such shipments.

IX. TEC/WG Stakeholder Recommendations to DOE Regarding Routing

1. DOE should develop a standardized, cooperative approach to route-selection for all unclassified shipping campaigns involving radioactive materials. As its model, DOE should use the route-selection process established for the WIPP program, at a minimum incorporating the following elements:
 - a) timely initiation of the route-selection process to enable the approval of final routes well in advance of the start of shipments (opinion among the topic group members concerning the necessary advance time period varied from 1 to 3 years);
 - b) proposal of preliminary primary and secondary routes, consistent with any state or regional routing plans, to the affected states, tribes, and local governments for their review and comment, with the goal of reaching agreement among the affected parties;
 - c) full use of the regional, tribal, and local cooperative-agreement groups in initiating contacts with the states, tribes, and local governments and in coordinating the review and comment process; and
 - d) inclusion of approved primary and secondary routes as a specific, enforceable provision in contracts with carriers.

2. DOE's route selection process should be aimed at achieving three main goals:
 - a) promoting safety and public acceptance of the selected routes by making the federal government, not a private company, accountable for route-selection;
 - b) allowing resources (inspections, emergency response, etc.) to be focused by reducing the total number of routes; and
 - c) giving states and communities sufficient time to prepare for shipments by eliminating the uncertainty regarding which routes will be used.

3. The Secretary of Energy should submit the final Routing Discussion Paper with its recommendations to the Secretary of the U.S. Department of Transportation; the administrators of the Federal Railroad Administration, Federal Highway Administration, Research and Special Programs Administration; the Nuclear Regulatory Commission; Congressional leaders, including the Speaker of the U.S. House of Representatives, the House Minority Leader, the Majority and Minority Leaders of the U.S. Senate, the Chairs and Ranking Minority Members of the House Committee on Commerce, and the Senate Committee on Energy and Natural Resources; the Nuclear Waste Technical Review Board; the Defense Nuclear Facilities Safety Board; all senior program managers at the U.S. Department of Energy; all lead contacts for the TEC/WG member organizations; the governors and state legislative leaders of the 48 contiguous United States; and the governors of all federally recognized Tribal Nations.

APPENDIX A: REFERENCES

1. Bradbury, Judith A. and Schultheisz, Daniel J., *Financial Assistance to States and Tribes to Support Emergency Preparedness and Response and the Safe Transportation of Hazardous Shipments: 1997 Update*, July 1997 (PNL-10260 Rev. 2)
2. League of Women Voters Education Fund, *Transporting Radioactive Spent Fuel: An Issue Brief*, July 1996.
3. Council of State Governments—Midwestern Office, *Radioactive Materials Transportation: A Guide for Midwestern Legislators*, Dec. 1996 (DOE/RW/00286-10).
4. Council of State Governments—Midwestern Office, *Midwestern States Routing Report*, Oct. 1995 (DOE/RW/00286-7).
5. Jacob, G., *The Hazardous Materials Transportation Uniform Safety Act of 1990: Implications for the Transportation of Spent Nuclear Fuel and High-Level Radioactive Waste*, NWPO-TN-014-92, Prepared for Nevada Agency for Nuclear Projects/Nuclear Waste Project Office, June 1992 (reviews legislative history and implications of HMTUSA provisions regarding route and mode selection, NRC certification of casks, and emergency response training).
6. Planning Information Corporation, *The Transportation of Spent Nuclear Fuel and High Level Waste: A Systematic Basis for Planning and Management at National, Regional and Community Levels*, Report Prepared for Nevada Agency for Nuclear Projects/ Nuclear Waste Project Office, Sept. 1996 (identifies most likely highway and rail routes to a repository and/or storage facility in Nevada; examines how rail and highway route decisions in Nevada will affect selection of cross-country routes; and includes detailed rail and highway route maps).
7. Souleyrette, R.R. et al., *Yucca Mountain Transportation Routes: Preliminary Characterization and Risk Analysis, Vols. 1-3*, NWPO-TN-011-91, Prepared for Nevada Agency for Nuclear Projects/Nuclear Waste Project Office, May 1991 (details methodologies and data requirements for comparative safety evaluation of highway and rail routes, and for state designation of alternative highway routes per HM-164).
8. Schmitt, R.C. , Quinn, G.J., and Tyacke, M.J., Idaho National Engineering Laboratory, “Historical Summary of the Three Mile Island Unit 2 Core Debris Transportation Campaign,” DOE/ID-10400, Mar. 1993.
9. Southern States Energy Board, *Spent Fuel and High-Level Radioactive Waste Transportation Handbook*, Jan. 1995.
10. Southern States Energy Board, *Transportation Planning Guide for the U.S. Department of Energy’s Shipments of Transuranic Waste*, Sept. 1997.

11. Title 49, Code of Federal Regulations Part 397, Subpart D, *Routing of Class 7 (Radioactive) Materials* (Oct. 1, 1996).
12. U.S. Department of Energy, Memorandum from Lawrence H. Harmon, Defense Programs, *Current Recommended Practice for DOE Rail Routing of Unclassified Spent Nuclear Fuel and High-Level Waste*, Aug. 29, 1988.
13. U.S. Department of Energy, Attachment G: *Environmental Management's National Action Plan on the Intersite Transfer of Waste and Nuclear Materials (Discussion Draft) Attachment to Accelerating Cleanup: Focus on 2006*. (June 1997).
14. U.S. Department of Energy Office of Environmental Management, *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage and Disposal of Radioactive and Hazardous Waste*, May 1997 (DOE/EIS-0200-F), Response to Public Comments.
15. U.S. Department of Energy National Transportation Program, *Program Managers' Guide to Transportation Planning*, Jan. 1997.
16. U.S. Department of Energy, Office of Safety and Health, *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements*. (Aug. 1994).
17. U.S. Department of Transportation, *Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Material*, No. DOT/ RSPA/HMS/92-02 (Aug. 1992).
18. U.S. Department of Transportation, *Index to Preemption of State and Local Laws and Regulations Under the Federal Hazardous Material Transportation Law* (Oct. 1, 1997).
19. U.S. Nuclear Regulatory Commission, *Public Information Circular for Shipments of Irradiated Reactor Fuel*, KNURL-0725, Rev. 17, July 1996 (provides data on spent nuclear fuel shipments, by mode and route, since 1980; a summary of relevant NRC regulations; and maps of routes used since 1980).
20. Western Governors' Association, *Waste Isolation Pilot Plant Program Transportation Safety Implementation Guide*, Aug. 1997.

APPENDIX B

TEC/WG Routing Topic Group Participants

Jozette Booth, U.S. Department of Energy, Office of Civilian Radioactive Waste Management

J.C. de la Garza, U.S. Department of Energy, Yucca Mountain Project Office

Dale DeCesare, Western Interstate Energy Board

Robert Deegan, Sierra Club Nuclear Waste Task Force

Russell diBartolo, Clark County, Nevada

Ray English, U.S. Department of Energy, Naval Reactors Program

Allan Fisher, CONRAIL

Bob Halstead, Nevada Nuclear Waste Project Office

Steven Hamp, U.S. Department of Energy, National Transportation Program

Judith Holm, U.S. Department of Energy, National Transportation Program

Norm Lindgren, Utah Department of Transportation

Sharon Long, U.S. Department of Energy, Office of Civilian Radioactive Waste Management

Brad Mettam, National Association of Counties

Frank Moussa, Kansas Emergency Management Division

Ken Niles, Oregon Office of Energy

Phillip Paull, Council of State Governments/Eastern Regional Conference

Markus Popa, U.S. Department of Energy, Office of Civilian Radioactive Waste Management

Ron Ross, Western Governors' Association

Lisa Sattler, Council of State Governments, Midwestern Office

Ralph Smith, U.S. Department of Energy, Carlsbad Area Office

Brian Stockes, National Congress of American Indians

Richard Swedberg, U.S. Department of Transportation, Office of Motor Carriers

Alex Thrower, Urban Energy & Transportation Corporation

Christopher Wells, Southern States Energy Board