

## Shipping Radioactive Waste

### Estimated Rail and Truck Shipment Numbers in a Mostly Rail Scenario Using the Caliente Rail Spur

<b>MIDWEST</b>	Truck Originating	Truck Total	Rail Originating	Rail Total	Total Originating	Total
Illinois	0	1,071	861	7,027	861	8,098
Indiana	0	580	0	5,980	0	6,560
Iowa	0	1,079	57	3,301	57	4,380
Kansas	0	0	63	4,253	63	4,253
Michigan	0	0	287	287	287	287
Minnesota	8	8	135	135	143	143
Missouri	0	491	71	4,069	71	4,560
Nebraska	0	1,079	103	7,657	103	8,736
North Dakota	0	0	0	0	0	0
Ohio	0	580	106	2,381	106	2,961
South Dakota	0	0	0	32	0	32
Wisconsin	0	0	186	186	186	186
<b>NORTHEAST</b>						
Connecticut	0	0	295	295	295	295
Delaware	0	0	0	0	0	0
Maine	0	0	55	55	55	55
Massachusetts	154	154	39	511	193	665
New Hampshire	0	0	49	104	49	104
New Jersey	0	335	244	244	244	579
New York	465	580	350	861	815	1,441
Pennsylvania	0	580	661	2,078	661	2,658
Rhode Island	0	0	0	0	0	0
Vermont	0	0	73	192	73	192
<b>SOUTH</b>						
Alabama	0	0	283	2,413	283	2,413
Arkansas	0	0	121	201	121	201
District of Columbia	0	0	0	312	0	312
Florida	491	491	202	202	693	693
Georgia	0	491	321	4,561	321	5,052
Kentucky	0	491	0	3,312	0	3,803
Louisiana	0	0	123	203	123	203
Maryland	0	0	169	312	169	312
Mississippi	0	0	80	80	80	80
North Carolina	0	0	486	943	486	943
Oklahoma	0	0	0	412	0	412
South Carolina	0	0	1,899	2,385	1,899	2,385
Tennessee	0	491	121	3,312	121	3,803
Texas	0	0	269	472	269	472
Virginia	0	0	340	340	340	340
West Virginia	0	0	0	509	0	509
<b>WEST</b>						
Arizona	0	1,079	193	374	193	1,453
California	0	0	286	660	286	660
Colorado	0	0	36	7,904	36	7,904
Idaho	0	0	433	1,049	433	1,049
Montana	0	0	0	0	0	0
Oregon	0	0	33	649	33	649
Nevada	0	1,079	0	9,646	0	10,725
New Mexico	0	0	0	181	0	181
Utah	0	1,079	0	8,986	0	10,065
Washington	0	0	616	616	616	616
Wyoming	0	1,079	0	7,347	0	8,426

Source: U.S. Department of Energy, Final 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-0250, February 2002.

# WASTE NOT, WANT NOT WASTE ...



## *CSG Regional Projects Assure State Involvement in Movement of Radioactive Waste*

The Council of State Governments' (CSG) Midwestern Office and Eastern Regional Conference have undertaken projects to assure state involvement in planning and executing radioactive waste shipments conducted by the U.S. Department of Energy (DOE).

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# ASK

any state legislator what his or her top five policy issues are and it is unlikely radioactive waste transportation will appear on the list.

Yet virtually all states are affected by shipments of some kind of radioactive waste or materials, tied to activities such as nuclear medicine, electric generation or commercial irradiation services. A large number of shipments involve cleanup of the nation's former nuclear weapons complex.

An estimated 45 states could someday be on the shipping routes for moving highly radioactive spent nuclear fuel from commercial power plants if the federal government succeeds in building a national repository for the waste in Nevada.

Because of the widespread impact of radioactive waste shipments, The Council of State Governments' (CSG) Midwestern Office and Eastern Regional Conference have undertaken projects to assure state involvement in planning and executing the shipments conducted by the U.S. Department of Energy (DOE). Funded by cooperative agreements with DOE, the Midwestern Radioactive Materials Transportation Project and Northeast High-Level Radioactive Waste Transportation Project assist state officials by informing them about ongoing shipments and organizing regional committees to work on planning for both current and future shipments.

Through these two projects, states in the Midwest and the Northeast are preparing for the day when hundreds or even thousands of shipments of highly radioactive waste destined for interim

storage or permanent disposal facilities travel their roads and rails.

Wisconsin Rep. Phil Montgomery believes the states derive great value from these projects.

"I really believe that the role that CSG has been playing in getting a fairly complex issue down to understandable terms so that legislators can communicate these ideas to their constituents and to their colleagues—it's just an extremely valuable service for us," he said.

Robert Owen of the Ohio Department of Health agrees.

"As far as being able to roll up our sleeves and work through these issues with DOE, (the regional committee is) the forum that's established for that. I think states need to utilize that to the greatest extent possible," said Owen, co-chair of the Midwest's regional committee

## Yucca Mountain

Management and disposal of radioactive waste have been concerns for state officials and the public since the dawn of the nuclear era.

It wasn't until 1982, however, that Congress took up the issue of what to do with the long-lived spent fuel from the nation's nuclear power reactors. Congress found that deep geologic disposal is the safest solution in the Nuclear Waste Policy Act (NWPA) of 1982. In 2002, Congress designated Yucca Mountain, Nev., as the site for a federal repository. Under the NWPA, the federal government is responsible for disposing of spent fuel from the nation's fleet of commercial nuclear reactors, which currently generate around 20 percent of the electricity in the U.S.

Progress on Yucca Mountain has been delayed by management, legal and political problems, including strong opposition by officials in Nevada. According to Connecticut's Edward Wilds, co-chair of the regional committee in the Northeast, the biggest obstacles to Yucca Mountain are "based on politics, not a technical basis.

"In Connecticut, the public is more supportive of Yucca Mountain. If I ask someone in Waterford, they see the benefit. But Congress is not in touch with the average person," said Wilds.

The NWPA committed DOE to begin taking possession of the nation's spent fuel in 1998. According to DOE's latest "best achievable schedule," Yucca Mountain may begin accepting waste in 2017, provided the department meets a June 2008 deadline for submitting its license application to the Nuclear Regulatory Commission (NRC).

DOE has already missed its self-imposed deadline twice.

Because of the federal government's slow progress in constructing a repository, commercial power plants were forced to begin storing spent fuel on site in dry casks constructed of steel and concrete. In fact, there are 42 of these dry cask storage facilities at nuclear power plants in the U.S. Plant operators, legislators and the public are concerned Yucca Mountain's chronic delays will turn these dry storage systems into de facto disposal sites—something they were not designed to be.

Delays in the repository project are tied to a mountain of financial problems.

"In order to move Yucca Mountain forward, it will take a huge infusion of money," said Jane Beetem of the Missouri



Title page (pg 9): Radioactive waste departs the Battelle facility in Ohio. Photo courtesy of Tom Baillieul. Above: Standing atop Yucca Mountain in Nevada, state officials from the Midwest learn about the geology of the area. Photo courtesy of Conrad Smith.

Department of Natural Resources and co-chair of the Midwestern committee.

To pay for the program, Congress established the Nuclear Waste Fund. According to the Michigan Public Service Commission, utility ratepayers have contributed more than \$14 billion to the fund, which has accumulated another \$9 billion in interest. Money from the fund is appropriated yearly by Congress, though DOE has consistently received far less than it has requested.

Adding to the problem is a series of lawsuits from utilities, which are seeking damages for the construction and maintenance of dry cask systems after DOE's failure to begin accepting waste in 1998. The Nuclear Energy Institute estimates that settling all the utilities' claims over the lifetime of the program could cost taxpayers as much as \$61 billion.

Members of the regional committees in the Midwest and the Northeast agree there is a need for a national repository and remain hopeful a solution will arise.

"There needs to be someplace for (the waste) to go that is safer and securer than the present locations. This is not to say that where the waste is currently is unsafe or unsecure; however, we can do much better," said Charles Pray of Maine.

"If we want to become energy independent in the United States," added Iowa Rep. Steve Olson, "we're going to have to bite the bullet and utilize someplace like Yucca Mountain."

## Waste Transportation

Regardless of what happens with Yucca Mountain, the states recognize the importance of developing a trans-

portation system for moving waste safely and securely. Through the CSG regional projects, the states are developing policies and procedures to govern DOE's transportation system. Shipments will move by truck, train and potentially barge, and will travel through 45 states.

Given the significant impact shipments will have on the nation, the states believe they should have primary input into decisions such as the selection of routes. The Midwest and the Northeast conducted regional route analyses and presented to DOE potential routes that met each region's criteria for safety. The regions' input provided a starting point for DOE's national discussions on route selection, which commenced this year.

To ensure public safety, the states will also be involved in both point-of-origin and en route inspections of the shipments. All shipments will be thoroughly inspected before starting the trip to Yucca Mountain, and en route inspections will confirm that packaging and equipment are in the same condition, and radiation emissions are in the same range, as at the onset of the journey.

Highway shipments are relatively easy to stop and inspect, and states have long been using uniform inspection criteria developed by the Commercial Vehicle Safety Alliance (CVSA). Inspecting rail shipments, on the other hand, presents greater logistical challenges, and there is no uniform standard for state inspections. Having identified this need, Midwestern and Northeastern states are taking the lead in developing a uniform standard analogous to what CVSA has done for truck shipments.

An important aspect of transportation planning is shipment security. Shipments of spent fuel have long been subject to security measures, such as escorts, that are designed to protect the waste from being released either by accident or as a result of sabotage. The NRC regulates shipment security, and DOE has committed to meeting or exceeding these federal standards for shipment security. To maintain a direct link to shipments in transit, states are likely to provide shipment escorts even if DOE arranges for its own escorts.

Besides inspecting and escorting shipments, the states will also work with local governments to give emergency responders the information and training they need to respond to accidents involving shipments. Under the NWPA, DOE must provide affected states and tribes with funding and technical assistance to prepare for emergency response as well as activities that contribute to safe transportation, such as inspections.

In 2004 and 2005, the states in the Northeast and the Midwest contributed heavily to DOE's draft policy and procedures for implementing this part of the NWPA, called Section 180(c). DOE published the draft procedures in the *Federal Register* on July 23. The states are now reviewing the notice and will have an opportunity to pilot test the grant procedures in the future.

## Learning for the Future

Working with the Yucca Mountain project involves planning for shipments far into the future. But several states in the Midwest and the Northeast are al-



Inspectors check a shipment of spent nuclear fuel at the Charleston Naval Weapons Station in South Carolina before the train departs. Photo courtesy of U.S. Department of Energy.

We learn from each other. Each state is able to bring their history to the table and what they're planning to do compared to other states. We are able to see what works and what doesn't work ... so you don't have to do this by yourself."

—Robert Owen  
Ohio Department of Health

ready feeling the impact of DOE's radioactive waste shipments and are gaining experience that will inform their oversight of future shipments.

In 2003, DOE shipped nearly 26 metric tons of waste by train from West Valley, N.Y., to a federal facility in Idaho. The two regions worked with DOE to identify the route, inspected the shipment at the point of origin and en route, and performed near real-time monitoring of the shipment while it traveled.

The states have had similar involvement with shipments of transuranic waste from the nation's nuclear weapons production plants to DOE's Waste Isolation Pilot Plant (WIPP) in Carlsbad, N.M. WIPP is the federal site designed to receive the nation's transuranic waste generated through defense-related activities.

Since 2002, 33 shipments of transuranic waste have passed through the Midwestern states on their way to WIPP or to interim facilities. The Northeast has a small quantity of transuranic waste earmarked for disposal at WIPP. Under the federal law that governs the WIPP site, DOE provides affected states with financial assistance to defray the costs states incur as a result of the shipments. CSG has facilitated the states' receipt of this financial assistance in the Midwest and will do the same for states in the Northeast.

The regions have long been among CSG's greatest strengths, and the logic of a regional approach to resolving issues is evident in the transportation projects. Given the wide variations in state approaches to and experiences with radioactive waste transportation,

working with states on a regional basis is more efficient than working with states individually.

At the other extreme, reaching out to states on a national basis can obscure the unique regional perspectives and needs that, if ignored, can result in conflict. The interest of the Northeastern states, for example, has been foremost about getting rid of the accumulated waste. For many Northeastern officials, initiation of a major spent fuel shipment campaign cannot start soon enough considering the potential health and safety liability and the continuing expense for ratepayers of storing waste on site at power plants.

The Midwestern states, on the other hand, place equal emphasis on having DOE remove their waste and having substantive involvement in planning and overseeing shipping campaigns. Between 25 percent and 30 percent of the spent fuel destined for Yucca Mountain will come from Midwestern plants, and much of the waste in the Northeast and the South could eventually move through the Midwest. As the likely corridor for transporting so much of the nation's spent fuel, the Midwestern states are determined to make sure DOE's transportation system bears their imprint.

The regional committees not only help to build consensus on transportation issues, they also give states a chance to learn from others' experiences.

"Some of the other committee members have such a vast knowledge of the subject so that when I became a member they were willing to share their information with me and get me up to speed," said Beetem.

"We learn from each other," added Owen. "Each state is able to bring their history to the table and what they're planning to do compared to other states. We are able to see what works and what doesn't work ... so you don't have to do this by yourself."

The experience in the Northeast is similar.

"I have a better understanding of the inner workings of DOE and a better understanding of the challenges around transportation," said Rich Pinney of New Jersey. "When we have shipments from New Jersey, we will have to coordinate carefully with other states around routing, inspections, etc. It is good to start working with other states now."

As Congress and the administration grapple with the myriad of issues surrounding Yucca Mountain, the states in the Northeast and the Midwest will continue to work through CSG's regional projects to plan and prepare for ongoing and future shipments.

Olson, reflecting on his recent appointment to the committee, looks forward to the challenge.

"Even though I've only been a part of this for the past six months, it's been a very good learning experience," he said. "I look forward to putting a little time in on the committee."

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