

Radioactive Wastes: The Risks On The Rails

Baltimore Sun National Staff, Mike Adams, February 11, 2002

The metal containers designed to carry spent nuclear fuel from the Calvert Cliffs plant and other reactors to a proposed storage site in Nevada would have failed if the transport train had been engulfed in the estimated 1,500-degree heat of the Baltimore rail tunnel fire last summer, according to a consultant's report prepared for the state of Nevada.

More than 300,000 people would have been exposed to radiation leaking from the containers, built to withstand 1,475 degrees for 30 minutes, said the report compiled by Radioactive Waste Management Associates, which was hired by Nevada's Agency for Nuclear Projects.

The Baltimore blaze lasted more than three days, from July 18 to 22. Its duration and intense heat would have breached the two types of rail casks used to haul spent fuel - one made of steel with lead lining and the other of steel - under the conditions of the accident, the report concludes. The fire would not have triggered a nuclear blast, but the city would have been exposed to a catastrophic release of radiation. Each rail cask weighs about 145 tons fully loaded and contains 260 times the amount of radioactive cesium released by the Hiroshima atomic bomb, said Matthew Lamb, a co-author of the report.

"While these containers are strong, ... they are not designed to withstand everything that could happen on a transportation route," he said. "People who live along these routes should know what the possible consequences are. I don't want to be a fearmonger, the probability of these accidents is small, but it is not zero."

The Nevada agency is monitoring a federal plan to ship radioactive waste to Yucca Mountain, about 90 miles northwest of Las Vegas. Last month, Energy Secretary Spencer Abraham selected Yucca Mountain as the depository for about 77,000 tons of spent fuel and high-level nuclear waste that is being stored in 39 states, including Maryland. President Bush is expected to approve the recommendation this week, according to congressional sources.

Some of those shipments would pass through Baltimore's Howard Street Tunnel, part of one of the major East Coast rail routes.

Opposing Views

Eileen Supko, a nuclear engineer who often serves as a spokeswoman for the nuclear power industry, dismissed the Nevada report as "fearmongering."

"Truthfully, the purpose of that report from the state of Nevada and its contractors was to stir things up and to scare people," she said. "A lot of the rhetoric from the anti-nuclear groups is to generate fear. If you look at the history of spent nuclear shipments, not just in the United States but internationally, there has never been a release of radioactive materials from the containers."

Nevada officials, including Sen. Harry Reid, a ranking Democrat, are trying to derail the proposal by focusing on the dangers of transporting radioactive waste. The Yucca Mountain proposal is unpopular in Nevada, where many residents are angry about the nuclear waste it would send streaming into the state.

Baltimore Mayor Martin O'Malley said he was unfamiliar with the report and could not comment on its findings. But he said it might be prudent to direct high-level radioactive waste away from "vulnerable" and "heavily populated" areas.

If the plan moves forward, hundreds, perhaps thousands, of shipments of radioactive waste would be sent to Yucca Mountain annually for 24 to 38 years from 131 commercial, research and military reactors. Baltimore is one of 109 cities with populations of more than 100,000 along the likely shipping routes.

The Storage Problem

About 20 percent of the nation's electricity is generated by 103 commercial nuclear plants, and the industry's survival depends on the Yucca Mountain disposal site. No nuclear plants have been built since the accident at Three Mile Island in Pennsylvania in 1979, and none are likely to be built without a permanent solution to the storage problem.

Mitch Singer, a spokesman for the Nuclear Energy Institute, the industry's main trade organization, said there are now 18 reactor sites with dry cask storage and 14 more have such plans. By 2010, 60 commercial nuclear plants will need dry cask storage.

Nuclear fuel consists of uranium pellets encased in metal rods. Used or "spent" fuel is removed from the reactor to water-filled pools, where it cools for about 10 years. It is then moved to "dry" storage, where it has been piling up at reactor sites because there is no place to dispose of it.

Spent fuel has been accumulating at Calvert Cliffs since its first reactor went online in 1975. There is enough storage space there to last the life span of the plant's two reactors, which are licensed until 2034 and 2036, respectively, said Steven W. Unglesbee, a spokesman for the plant.

Calvert Cliffs is owned and operated by Constellation Energy Group, the parent company of Baltimore Gas and Electric Co., and produces about 40 percent of the energy generated by the utility.

Some utilities are suing the Energy Department because it agreed to start hauling the waste to Yucca Mountain about four years ago and the project has fallen behind schedule. About \$7 billion has been spent on the site, which could open in 2010 at the earliest. The completed project is expected to cost about \$58 billion.

Assessing The Risk

Yucca Mountain's opponents say the number of shipments and the uncertainties inherent in transporting hazardous waste by truck and train increase the probability of a catastrophic accident.

A spent fuel accident in the tunnel would have been disastrous for Baltimore. Whole city neighborhoods would have had to have been razed to reduce radiation to acceptable levels, Lamb said.

"It's either that," he said, "or the risk of a serious cancer hazard for the people who live close to where the accident took place and downwind."

Singer said nuclear waste has been shipped safely by truck and rail for more than 35 years. During that period, more than 3,000 shipments of spent fuel have traveled about 1.7 million miles in this country.

Supko said the shipping containers must be able to survive hypothetical accidents, represented by a 30-foot drop to a flat, unyielding surface, followed by puncture test, heat and immersion in water. She said computer simulations and actual tests on containers show that they will survive any likely accident.

Dropping a huge rail container onto a flat, unyielding surface is the equivalent of a high-speed accident because the container absorbs all of the energy, she said. Supko said the thermal test, which subjects containers to an engulfing fire of 1,475 degrees for 30 minutes, simulates conditions that would exceed a real-world accident, such as the tunnel fire.

In a transportation accident involving fire, the container would be sitting on a flatbed truck or rail car, and that would result in a heat transfer from the container to the other surface, she said.

A fire in which only the container is engulfed in flames is highly unlikely and simulates higher temperatures in a real-world situation, she added.

Federal regulations do not prohibit spent fuel from being shipped with other freight, so it could be involved in a rail accident such as the tunnel fire, the report said. But Supko disagreed.

She said it is highly unlikely that a railroad would allow spent fuel to be shipped with combustible chemicals or other hazardous cargo. It is much more likely that a "dedicated train," a train that hauls only nuclear waste, would be used to ship spent fuel to Yucca Mountain, she said.

Alt Rails

When Abraham picked Yucca Mountain, he pointed to national security as a reason for having a national nuclear waste repository.

"We should consolidate the nuclear wastes to enhance protection against terrorist attacks," he said in a letter to Nevada Gov. Kenny Guinn.

But critics say that implementing the plan would endanger national security.

"If Yucca Mountain moves forward, it merely increases the number of terrorist targets," said Robert R. Loux, the executive director of Nevada's Agency for Nuclear Projects. "We'll have 3,000 shipments moving by truck and train, 103 reactor sites and one big target - Yucca Mountain."

Singer contends that tight security for shipments and the nuclear industry's strong safety record negate critics' arguments.

"Is it vulnerable to a terrorist attack? Anything is possible," he said. "But due to the rigorous nature of the transportation canisters and the security measures that are taken, any shipment of them - by train or by truck - it would be very, very difficult, if not impossible [target] for a terrorist."