HOT CARGO: RADIOACTIVE WASTE TRANSPORTATION

When a centralized storage facility for highly radioactive nuclear fuel is opened, thousands of shipments of dangerous waste will begin coursing the nation's highways and rails each year. Accidents will happen. Are shipping containers safe? Are communities prepared for radiation-related accidents?

RADIOACTIVE FUEL BACKING UP

Without a safe publicly acceptable permanent repository, high-level waste has built up at more than 100 nuclear reactors across the country. This highly radioactive waste is presently shielded and cooled underwater in fuel pools that are rapidly filling to capacity. With no permanent disposal location, some utilities are beginning to store this waste outdoors in concrete containers. Shielding, with concrete, lead or water is essential; a person standing three feet from unshielded irradiated fuel would receive a lethal radiation dose in 10 seconds. While President Bush has approved the flawed Yucca Mountain as a permanent repository in Nevada, many challenges remain and these plans are no closer to realization than they were in 1972 when the first repository site was proposed in Lyons, Kansas. The operation date for a Nevada repository has been delayed repeatedly, and the State of Nevada and other opponents may yet defeat its use at all. As a temporary fix, utilities are planning a centralized storage facility on Native American lands in Utah. If either the Yucca dump or the “temporary” dump on the Skull Valley Goshute reservation near Salt Lake City happens, the high-level waste flood gates would open. Thousands of truck and train shipments would move dangerous radioactive waste across the country, by everyone's backyard. Transportation routes would go through 43 states. Department of Transportation regulations require highway shipments of nuclear waste to take the most direct Interstate routes, even if these routes traverse densely populated metropolitan areas.

SHIPPING CONTAINERS: THEY'RE BIG. THEY'RE STRONG. THEY'RE VULNERABLE.

A shipping cask is a cylindrical metal container, made up of steel and lead or uranium. Each truck shipping cask weighs 25 tons; rail casks weigh up to 125 tons. Inside the cask, the fuel consists of solid uranium stacked like poker chips within metal tubes. A collection of these tubes is called an assembly. A typical pressurized water reactor (PWR) uses 60 fuel assemblies, or 30 tons of fuel, each year. Each truck cask contains 1 to 4 PWR fuel assemblies. Each rail cask holds up to 24 fuel assemblies. In terms of radioactivity, each fuel assembly contains 10 times the long-lived radioactivity released by the Hiroshima bomb.

The more severe an accident, the more likely that radioactive material would be released to the environment. A low speed accident could unseat a valve or damage a seal, releasing radioactive particulates to the environment. The same event could crack the brittle metal tubing around the fuel. According to the American Petroleum Institute, heavy truck accidents occur about 6 times each million miles traveled. With thousands of truck shipments, at least 15 accidents are expected each year.

Shipping containers are designed to withstand a crash into an immovable object at 30 miles per hour. Obviously Interstate trucks travel much faster than 30 m.p.h. Impact into a bridge abutment or falls off a bridge could easily exceed the design limits of the container.

A fire associated with a truck or rail accident increases the probability that radioactivity will be released. Fires occur in 1.6% of all truck and 1% of all train accidents. Shipping containers are designed to withstand a 1/2-hour fire at a temperature of 1475 F. But rail fires could burn for hours, sometimes for days, at temperatures considerably higher. Diesel fuel burns at 1850 F. Some materials burn twice as hot. The heat could vaporize some radioactive materials and sweep them up into the air. Persons downwind could inhale radioactive particulates and later develop cancer or genetic effects.

None of the containers presently used on highways and rails has been physically tested. These containers were designed and built in the 1960's and '70's. Waste containers have only been tested by computer or hand calculators. Before the flood gates open on nuclear shipments, the Department of Energy should at least require that the new generation of shipping containers presently proposed be actually physically tested, but the Department has no such plans.

ARE YOU READY?

Even if a small percentage of radioactive waste is released from a shipping container, the number of health effects and the impact on a local community could be disastrous. A 1980 study by the Nuclear Regulatory Commission estimates economic consequences in an urban area on the order of $2 billion. A more recent study by Department of Energy contractors estimates economic costs on the order of $460 million, and a period greater than 1 year to clean up the radioactive residue.

Who would be first on the accident scene? Local fire, police and emergency personnel, who are neither trained nor equipped to cope with emergencies of this magnitude. It is important that fire companies extinguish a fire within a half hour, yet it is often unclear who has authority and responsibility for cleanup and protecting the public health in an emergency.

WHAT TO DO

High-level waste containers should be designed to withstand all real highway and rail accidents. The standards need to be raised. Waste containers should be physically tested to withstand realistic and credible accidents. Local community emergency personnel should be trained and equipped to handle radiation-related accidents. No nuclear fuel should move until these basic safety conditions are met.

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