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Opinion



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Waste can be transported safely

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I often wonder about all the public concern that surrounds the shipment of spent nuclear fuel to Yucca Mountain. President Franklin Roosevelt was right when he said that all we have to fear is fear itself.

During the past four decades, about 3,000 shipments of spent nuclear fuel have navigated more than 1.7 million miles of U.S. roads and railways. In this whole time, only 90 spent fuel casks have been involved in accidents. None resulted in any release of radioactive material.

Most fatalities and injuries associated with hazardous material transportation accidents result from gasoline tank trucks. I have to question why the public doesn't share the same concerns over the transport of gasoline and other hazardous materials on public roads as it does the movement of nuclear waste.

Safety measures employed for the transportation of high-level wastes have resulted in one of the most enviable safety records of industrial public transportation. This is made possible, in large part, by the strength of the casks used in the transport of HLW material. These casks are designed to protect the public against potential radiation exposure during any accident. The casks are about 15 times thicker than a gasoline tank truck shell and they include three inches of stainless steel with thick radiation shields. To be certified by federal authorities, cask designs must withstand three tests -- crashes, fire and puncture -- in specified accident conditions. They must also withstand eight hours under water.

It should be noted that the impact tests required by federal regulation exert forces on the casks that are greater than the impact forces in the worst recorded accidents. Temperatures produced in the casks by the regulatory fire tests are higher than those in any recorded fire accidents.

The nuclear industry tests the casks to conditions even beyond those requirements. For example, Sandia National Laboratories conducted three types of tests to measure the punishment casks can withstand:

- A 20-ton truck cask struck by a 120-ton diesel locomotive traveling at

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81 miles per hour;

- A 22-ton cask on a flatbed crashed into a 690-ton concrete block at 84 mph;
- A propane tank car exploding next to a cask in a pool, throwing the cask 33 feet.

The casks emerged with only minor damage, and in no test did the casks fail to hold their contents.

Recently, concerns have been raised about the potential impacts of terrorist attacks during the transport of high-level waste. We can say that the same features that render casks highly resistant to highway and rail accidents tend to make them difficult targets for terrorist attacks.

The casks are just one of the many elements that help ensure public safety. U.S. Department of Transportation regulations require carriers to use the safest routes available.

Risk assessments of the transportation of radioactive materials evaluate factors such as accident rates, transit time, population density, other vehicles sharing the route and time of day. The DOT identifies "preferred routes," which consist primarily of interstate highways and bypass routes around cities (where such routes exist) or an alternative route selected by a state routing authority.

If the routing authority selects an alternate route, a routing analysis is conducted to determine that the alternate route does not increase overall risk. Alternate route selections must be preceded by consultations between DOT and affected state and local authorities.


Most materials being transported are monitored by global satellites and are tracked at all times during the transportation process. Specialized trucking companies handle spent nuclear fuel shipments. These experienced, specially licensed companies haul all kinds of hazardous materials more than 50 million miles annually.

Vehicles are state-of-the-art, equipped with computers that provide an instantaneous update on the truck's location and convey messages between driver and dispatcher through a satellite communications network. Drivers receive extensive training and must be certified by the federal government.


The regulatory requirements on casks and transportation security and the industry's high level of performance have produced a safety record that would be difficult to match. This should reassure all Americans that the transport of spent nuclear fuel to Yucca Mountain can and will be conducted without harm to the public.

Gail H. Marcus is immediate past president of the American Nuclear Society, a professional society devoted to advancing nuclear science and technology. Dr. Marcus has S.B. and S.M. degrees in physics and an Sc.D. degree in nuclear engineering from the Massachusetts Institute of Technology.

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