

## Position Statement #18

# The Safety of Transporting Radioactive Materials



More than 45 million shipments of radioactive materials have taken place in the United States over the last three decades, with a current rate of about three million per year. The majority of these radioactive shipments consist of radiopharmaceuticals, luminous dials and indicators, smoke detectors, contaminated clothing and equipment, and research and industrial sources. Fewer than 3,500, or 0.01%, have been involved in any sort of accident, incident, or anything other than routine transportation. And, fewer than 200 were damaged or failed in any form. None of the damaged packages contained used fuel or high-level radioactive materials. Small amounts of radioactive materials were released in some instances, but they were always below the limits allowed by the Code of Federal Regulations, Title 10, Part 71, Appendix A, Table A2, and no cases resulted in any health effects attributable to these events.

All shipments of radioactive materials take place according to regulations issued by the U.S. Department of Transportation and the U.S. Nuclear Regulatory Commission. Federal regulations address packaging, labeling, loading and unloading, storage, transportation routes, and vehicle requirements, and they impose limits on external radiation. There are also requirements to protect against the diversion of these materials. All shippers and carriers are licensed as are the storage and shipping containers. For example, packages for the transportation of materials with the highest levels of radioactivity—including used nuclear fuel—are required to survive such simulated accident conditions as a crash at high speed into a concrete barrier, water immersion, a 30-foot drop onto an unyielding surface, severe impact, and extreme heat. Studies of the risk posed by the transportation of used fuel confirm that the current regulations provide adequate protection of the public health and safety. In addition, used fuel shipments take

place only along specified routes, and governors of states through which the material will pass are notified in advance.

Operation of a central repository for used nuclear fuel would result in additional shipments from the reactor sites, where the fuel is currently stored, to the repository. Current estimates are for about 2,200 truck shipments and 500 rail shipments per year over a 24-year period. This would constitute an increase of less than 0.1% over the current number of radioactive shipments and less than 0.0007% of the 400 million shipments of all kinds of hazardous materials taking place per year in the United States. The nuclear energy industry has transported more than 3,000 shipments of used nuclear fuel over 1.7 million miles of U.S. highways and railroads since 1964.

No nuclear fuel container has ever cracked or released any radioactive material to the environment. Similarly, the U.S. Department of Energy has transported to the Waste Isolation Pilot Project in New Mexico about 700 shipments of transuranic waste over 1.5 million miles since 1999 without incident.

The American Nuclear Society (ANS) believes that the transportation of radioactive materials in the United States has been conducted, and can be continued, with an excellent safety record. In view of this safety record, the small number of shipments compared to the volume of other hazardous materials, and the inherent robustness and stringent requirements imposed on the shipping casks, ANS believes that the projected shipments of used nuclear fuel to a repository can be accomplished safely and without impacting the health and safety of, or adding any significant risk to, the population along the shipping routes.



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June 2002