

June 28, 2002

The Honorable Richard A. Meserve
Chairman
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Meserve:

SUBJECT: PROPOSED PACKAGE PERFORMANCE STUDY TEST PROTOCOLS

During its 135th meeting on June 18, 2002, the Advisory Committee on Nuclear Waste heard presentations from Sandia National Laboratories on the proposed Package Performance Study (PPS) Test Protocols. These test protocols are part of the overall PPS to demonstrate the safety of spent fuel and other radioactive material shipments. During the presentations it was stated that the PPS has three goals.

1. Validate the assumptions and methodologies used to assess the appropriateness of U. S. Nuclear Regulatory Commission transportation regulations.
2. Demonstrate the safety of spent fuel and other radioactive material shipments.
3. Advance the knowledge base of cask and spent fuel behavior in transport accident environments.

The PPS supplements the existing knowledge on the safety of transporting spent nuclear fuel, which has an excellent operating record and is based on extensive research, analysis, and testing (see References).

The proposed report uses the results of NUREG-6672, "Reexamination of Spent Fuel Shipment Risk Estimates - Main Report," dated March 2000 and the "Spent Nuclear Fuel Transportation Package Performance Study Issues Report," dated June 2000 to help define the program.

OBSERVATIONS

We have the following observations regarding the proposed PPS Test Protocols.

- Testing casks to deformation and fuel to failure, when the test conditions significantly exceed realistic accident conditions, provides little benefit for assessing the risk associated with shipping spent fuel and other radioactive materials.

- Full-scale cask testing under realistic accident conditions may be a suitable demonstration to increase public confidence in the safe transportation of spent fuel and other radioactive materials, but will not contribute significantly to existing knowledge base.
- Testing to validate computer codes should be performed, but the approach in the proposed report is not an efficient use of resources. For example, codes can be effectively, economically, and accurately validated into the plastic deformation range using scale models.

RECOMMENDATIONS

We recommend the following items be considered regarding the proposed PPS Test Protocols.

- The approach should be designed to provide risk-insights; tests to validate codes should be separate from other tests performed to provide safety insights unless such tests do not distort the risk insight objective.
- The approach should utilize realistic accident situations, not unrealistic and extreme test conditions.

DISCUSSION

The ACNW reviewed the proposed PPS Test Protocols and determined that the tests focused too heavily on unrealistic testing designed to result in deformation of transportation casks and failure of the test fuel. We further determined that these tests were not consistent with the NRC's philosophy regarding risk-informed regulation. We are concerned with the lack of a risk assessment, that should include an uncertainty analysis, on which to base the tests.

The proposed PPS Test Protocols utilizes extreme conditions, well beyond those that would be encountered in actual transportation. The results of tests performed under an artificial set of extreme accident conditions could be misinterpreted and may lead to unwarranted changes in the transportation regulations.

We observed that the guidance for the proposed PPS Test Protocols is "test to failure" for fuel elements. Such information may add to the understanding of fuel response to extremely severe and hypothetical conditions, but does not provide risk-informed insight regarding the safety of transporting spent nuclear fuel.

The proposed PPS Test Protocols specifies test conditions that substantially exceed what is required to achieve the stated goals of the PPS. Therefore, the goals of the PPS were not all met because a program, designed to cause cask deformation under extreme accident conditions, does not validate cask safety under the realistic accident conditions that the cask was designed to meet. We believe the approach used in the proposed PPS Test Protocols

should be reformulated to focus on realistic, risk-informed test methodologies and protocols, not unrealistic test-to-failure scenarios.

Sincerely,

/RA/

George M. Hornberger
Chairman

References:

1. U. S. Nuclear Regulatory Commission, NUREG-0170, "Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes," December 1977.
2. U. S. Nuclear Regulatory Commission, NUREG/CR-4829, Vols. 1 and 2, "Shipping Container Response to Severe Highway and Railway Accident Conditions - Main Report," February 1987.
3. U. S. Nuclear Regulatory Commission, NUREG/CR-6672, Vol 1, "Reexamination of Spent Fuel Shipment Risk Estimates," Main Report, March 2000.
4. Sandia National Laboratories, "Spent Nuclear Fuel Transportation Package Performance Study Issues Report," June 30, 2000.
5. U. S. Nuclear Regulatory Commission, NUREG/CR-XXXX, Draft report prepared by Sandia National Laboratories, "United States Nuclear Regulatory Commission Package Performance Study Test Protocols," June 2002 (Draft Predecisional).