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April 15, 2003

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Mr. Michael Lesar
Chief, Rules & Directive Branch
Office of Administration
Mail Stop T6-D-59
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Mr. Lesar:

These are comments on NRC's proposed Spent Fuel Transportation Package Performance Study (PPS) Test Protocols.

I was an invited participant at the PPS Public Meeting at Las Vegas, NV on March 12, 2003 and expressed most of these comments at that time. However, I believe it would be useful to reiterate my conclusions in a concise, yet complete manner. These are my personal views, not necessarily those of my employer, the New Mexico Environmental Evaluation Group (EEG).

First, I believe that all packages seeking certification by NRC should be subject to the full-scale hypothetical accident drop, puncture, and fire tests specified in 40 CFR Part 71. This was required for the TRUPACT-II package in 1988-1989 and resulted in slight improvements to the final design. More importantly, it gave those of us in EEG (which provides independent technical oversight on all aspects of the WIPP Project) confidence that this was a robust package whose use we could support and defend to those still skeptical. Modeling and extrapolation of results from less than full scale tests would have left us more uncertain. The acceptance of TRUPACT-II by New Mexico and other Western States has been good and we believe this is mostly due to the full scale testing. EEG has never requested extra-regulatory testing of TRUPACT-II and has told some members of the public we did not think it was necessary.

Objectives of PPS

The primary purposes of the study should be to confirm finite element analyses, to provide data to refine dose risk estimates from extra-regulatory accidents, and to improve the certification process. In all of our analysis over the years we have calculated possible releases from severe accidents without any emperical data to guide us.

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Add - A. Snyder (AMS3)
A.S. Murphy (ASMA)

Mr. Michael Lesar
April 15, 2003
Page 2

The PPS may not increase public confidence because some are likely to conclude that any release from a 75 mph accident proves the casks are not safe (even though we have always predicted such releases could occur).

The statement in section 2.2 of NUREG-1768 that the PPS "is not intended to validate or confirm the process with which the NRC certifies spent fuel packages" is disconcerting. Does this mean that if either of the two casks fails to pass the full scale hypothetical accident tests that their certification will not be reevaluated? Prudence suggests a cask that fails to pass these tests should not be certified.

General Testing Issues

One truck and one rail cask should be sufficient for the proposed regulatory tests. This should give a good indication of the adequacy of the finite element analysis and improve dose risk estimates.

Consideration should be given to using two or three surrogate fuel assemblies in the packages rather than just one. NUREG/CR-6672 predicts an average failure rate of about 45% at 60 mph and it may be difficult to interpret the results from only one surrogate assembly (if it fails, do you assume 100% failure? If it does not fail do you assume 0% failure?) Failure of spent fuel assemblies is an important element of risk estimates because there must be assembly failure before a release can occur and this portion of the PPS should not be slighted.

Impact Test Issues

The 75 mph impact speed for the truck and rail casks is appropriate. Your analysis indicates questionable deformation at 60 mph and deformation is needed for model verification and risk estimates. The probability of a 75 mph accident ($\leq 1\%$) is low enough to be concerned about.

Dropping from a tower onto an unyielding surface is preferable because the velocity of impact is accurately known and it avoids analyses and speculation of how much of the energy was actually absorbed by the vehicle.

I have no specific recommendations about the orientation of the package for the impact tests.

Consideration should be given to performing an extra-regulatory puncture test even though NUREG/CR-6672 (page 5-26) gives a reasonable explanation of why this may not be necessary. In TRUPACT-II (a different type of package) the puncture tests were more challenging than the drop tests.

Mr. Michael Lesar
April 15, 2003
Page 3

The need to test a package to destruction was discussed at the March 12 Las Vegas meeting. I do not believe this is necessary. However, to obtain the best data from the PPS it will be necessary to have some package deformation and failure of assemblies and seals.

Fire Test Issues

There should be a regulatory fire test after the drop and puncture tests and containment should be verified after the fire test. An extra-regulatory fire test should also be performed for a long enough period to expect seal failure in order to refine risk estimates.

There appears to be some uncertainty in how the fire tests will be conducted and whether it would be on the same cask that had been subjected to a 75 mph impact test. A comment is made about not being able to check containment on a cask that had already been deformed.

I believe that both the regulatory and extra-regulatory fire tests should be performed on casks that have been subjected to the regulatory drop and puncture tests and that containment should be determined. It is possible that the same cask that had been subjected to the regulatory fire test could, at a later time, be subject to the extra-regulatory fire test (because the regulatory test shouldn't cause permanent damage).

The opportunity to participate in the Las Vegas meeting is appreciated. I agree with the intents of the PPS and (with the exceptions noted above) the proposed protocol. The data obtained should be useful in verifying finite element models, refining risk analyses, and (if necessary) improving the cask certification process. Please call if there are questions.

Sincerely yours,



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