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State of Nevada

TO:

Chairman Meserve

FOR SIGNATURE OF : ** PRI ** CRC NO: 02-0811

Chairman Meserve

DESC:

Full-Scale Physical Testing for Spent Fuel Shipping Casks

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STATE OF NEVADA

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December 9, 2002

Richard Meserve, Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Full-Scale Physical Testing for Spent Fuel Shipping Casks

Dear Chairman Meserve:

Nevada has long urged NRC to require full-scale testing as part of the certification process for any new casks that could be used for shipments to Yucca Mountain. We understand that NRC has proposed demonstration testing of one or two "representative" shipping casks as part of the Package Performance Study (PPS) to be conducted by Sandia National Laboratories. If appropriately designed and implemented, the planned PPS tests can provide significant information for risk assessment and risk management. The PPS tests cannot, however, be considered a substitute for full-scale testing of each new cask design prior to certification.

Nevada believes that full-scale tests should be an integral part of the certification process. As we informed the NRC through our meeting statements and written comments on the PPS, Nevada proposes a four-part approach to full-scale certification testing: (1) meaningful stakeholder participation in development of testing protocols and selection of test facilities and personnel; (2) full-scale physical testing (sequential drop, fire, puncture, and immersion) prior to NRC certification; (3) additional computer simulations to determine performance in extra-regulatory accidents and to determine failure thresholds; and (4) reevaluation of previous risk study findings, and if appropriate, revision of NRC cask performance standards. Nevada also considers destructive testing of a randomly selected production cask to be a highly desirable way of ascertaining actual failure thresholds.

Nevada has previously recommended that the Commission consider full-scale testing to assess shipping cask vulnerability to terrorism and sabotage. In our 1999 petition for rulemaking , Docket No. PRM-73-10, Nevada requested a comprehensive assessment of the consequences of three types of attacks which have the potential for radiological sabotage: attacks against transportation infrastructure used by nuclear waste shipments, attacks involving capture of a nuclear waste shipment and use of high energy explosives against the cask, and direct attacks upon a nuclear waste shipping cask using antitank missiles. As part of that assessment, Nevada recommended that the Commission consider the need for physical testing, full-scale and/or scale model, to evaluate weapons capabilities, cask vulnerability to attack with high-energy explosive devices, and the response of spent nuclear fuel to such attacks (specifically, to determine fuel mass release from a cask, particle size distribution of released fuel, and special concerns associated with volatile radionuclides such as Cs-134 and Cs-137). NRC has yet to take any action on Nevada's petition, despite the added urgency brought about by the events of September 11th and their implications for potential terrorism against spent fuel and/or high-level waste shipments.

During the preliminary phase of the Package Performance Study, 1999 - 2000, the NRC repeatedly acknowledged the importance of establishing stakeholder confidence in the PPS study process and in its findings. The upcoming PPS testing program could provide an important opportunity for NRC to demonstrate its commitment to stakeholder participation. Yet the NRC has still not issued the draft PPS testing protocol for public review and comment, as promised in June-July, 2002, nor has NRC rescheduled the promised PPS public meetings in Nevada, originally planned for August-September, 2002. On the other hand, it appears that NRC presented "draft predecisional" PPS testing protocols to the Advisory Committee on Nuclear Waste (ACNW) in June 2002, but to our knowledge this document has not been provided to any of the stakeholders who previously participated in the PPS public meetings. The process to date does not inspire confidence, nor does it come close to meeting NRC stated commitment to public and stakeholder involvement in development and review of testing protocols.

We would like to take this opportunity to make several recommendations regarding the proposed PPS cask tests:

(1) Stakeholder Participation

The only way to assure that a testing program is not just an engineering exercise but has relevance to real world conditions is to provide for the substantive and meaningful participation of stakeholders not part of the NRC and DOE "family" in specifying the objectives of the tests, developing the testing protocols, selecting the testing contractors, and overseeing the implementation of the test program. A model for effective stakeholder involvement is the approach used for testing of the TRUPAC shipping container used for transporting transuranic waste to the Waste Isolation Pilot Plant facility in New Mexico. In that case, representatives from affected states as well as

outside consultants identified by the states were fully involved in the design of the test program and in overseeing its implementation. Not only did such involvement assure greater public acceptance of cask safety and the entire WIPP shipping program, but it also resulted in the identification of engineering and safety flaws that likely would not have been found absent the involvement of these "outside" participants.

(2) Selection of Cask Testing Facilities

Public statements by NRC representatives (for example, by Chester Poslusny, in Las Vegas, on 11/14/02) suggest that the decision has already been made to conduct the proposed tests at Sandia National Laboratories in New Mexico. Before a final selection of test facilities, Nevada believes that NRC should discuss the relevant issues with stakeholders. Nevada believes that the accessibility of the test facilities to stakeholders, and the willingness of facility personnel to facilitate stakeholder participation in testing, are just as important as the facilities technical testing capabilities. Nevada contractors have identified and evaluated existing cask test facilities in the United States and abroad. Nevada contractors and SNL personnel have identified limitations in SNL's capabilities to perform drop and fire tests on large rail casks.

(3) Selection of Casks to Be Tested

Nevada believes that the PPS should test the actual cask designs most likely to be used for spent nuclear fuel and HLW shipments to the proposed Yucca Mountain repository. Highest priority should be given to testing a truck cask, since legal-weight truck is the only transport mode for Yucca Mountain that is currently feasible. All 72 power plant sites and all 5 DOE sites can ship by legal-weight truck. At present, there is no railroad access to Yucca Mountain., and the feasibility of long-distance heavy haul truck (HHT) transport of rail casks in Nevada is unproven. Based on the information presented in DOE's Final EIS for Yucca Mountain, the General Atomics GA-4 cask, designed to transport 4 PWR assemblies, is the most appropriate choice for testing. The GA-4 could be used for about two-thirds of all shipments under DOE's "mostly legal-weight truck" national shipping scenario. To our knowledge, no GA-4 casks have yet been fabricated, although NRC has certified the design.

Selection of the appropriate rail cask for PPS testing is also important. Although DOE has not yet formally selected a preferred mode, DOE representatives have stated that DOE intends to issue a Record of Decision designating rail as the preferred mode for shipments to Yucca Mountain. DOE's FEIS identified a number of potential rail cask designs for repository shipments, some similar and others dissimilar to rail casks currently certified by the NRC. Nevada strongly recommends that NRC defer selection of a rail cask for PPS testing until after extensive discussions with the affected stakeholders.

(4) Selection of Test Scenarios

Nevada strongly supports the position that the PPS tests should evaluate cask performance in extra-regulatory accident environments, that is, performance under accident conditions that could cause failure of both the cask and the spent fuel cargo. Nevada has not yet, however, made final decisions on precisely what test scenarios the PPS should evaluate. Based on NRC commitments made in 2000 and 2001, Nevada expects NRC to defer final decisions on the PPS test protocols until after extensive discussion with the affected stakeholders.

Nevada is currently reexamining its position on full-scale fire testing, based on analyses of the July 2001 Baltimore rail tunnel fire, and we urge NRC to likewise. Previous contractor studies sponsored by Nevada assessed the potential consequences of severe fire accidents involving truck and rail casks. Preliminary analyses of the July 2001 Baltimore accident by Nevada consultants and by the NRC both conclude that fire temperatures in the Baltimore tunnel reached or exceeded 1500°F, although estimates of the fire duration at this temperature vary from seven hours to more than 24 hours. Performance envelope analyses indicate that large rail casks involved in such fire environments (temperature exceeding 1500°F) for more than 20 hours could result in failure of cask seals and oxidation of fuel pellets.

Nevada is also reviewing historical accidents involving high-speed collisions and massive infrastructure failures and potential accident conditions along shipping routes identified in the DOE FEIS in order to more precisely characterize maximum credible, "real-world" accident scenarios. As we have previously stated in our comments during the PPS public meetings, and in our comments on NRC documents such as NUREG/CR-6672, we believe that NRC and SNL have failed to adequately characterize potential severe accident conditions based on "real-world" experience and on the specific hazards along potential routes identified by DOE. One example that we have previously brought to the NRC's attention in the 10CFR71 proposed "Harmonization" rulemaking concerns DOE's proposal for barge shipments on Lake Michigan, where maximum depths exceed the IAEA 200 meter immersion performance standard.

Conclusion

In your testimony before Congress last summer, you indicated that NRC was committed to a meaningful compliance testing program for casks intended for shipping spent fuel and high-level waste to Yucca Mountain. That, however, does not appear to be what NRC is proposing in the package performance study. While it has been difficult to ascertain exactly what NRC hopes to accomplish in the study, it seems from public pronouncements by NRC staff that the planned cask test program will be little more than a one-time public relations exercise designed to produce dramatic videos, with questionable utility for testing the tolerances and survivability of new cask designs. Nor

does the NRC proposal represent a commitment to requiring full-scale tests as part of the cask certification process.

Nevada believes that comprehensive full-scale testing would not only demonstrate compliance with NRC performance standards. It would improve the overall safety of the cask and vehicle system and generally enhance confidence in both qualitative and probabilistic risk analysis techniques. It could potentially increase acceptance of shipments by state and local officials and the general public, and potentially reduce adverse social and economic impacts caused by public perception of transportation risks.

It nears noting that none of the SNF shipping casks currently used in the United States have ever been tested full-scale. This fact was confirmed by you in letters to Senator Harry Reid dated April 2, 2002 and April 24, 2002. As DOE has no plans to require full-scale testing of new casks that would be used for shipments of spent nuclear fuel to Yucca Mountain – and is actively resisting calls for such tests, the country could be faced with a situation where no meaningful full-scale tests of spent fuel shipping containers are conducted, despite the potentially massive shipping campaign DOE will need to implement as part of the Yucca Mountain program.

Because of serious credibility problems related to past federal government-sponsored cask testing, Nevada will be proposing a testing program, concurrent with NRC's propose package performance study, using Nevada universities to carry out an independent series of full-scale regulatory compliance and failure threshold cask tests as a way of overseeing and verifying NRC's findings.

I would urge the NRC to reassess its planned cask testing demonstration and commit to undertake a truly meaningful approach to full-scale cask testing as an integral part of the cask certification process.

Sincerely,

Robert R. Loux
Executive Director

RRL/cs
cc. Governor Guinn
Nevada Congressional Delegation
Nevada Commission on Nuclear Projects
George Hornberger, ACNW