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December 30, 2005

Chief, Rules Review and Directives Branch  
U.S. Nuclear Regulatory Commission  
Mail Stop T6-D59  
Washington, DC 20005-0001

RE: Comments on Draft Report, Spent Fuel Transportation Package Response to the  
Baltimore Tunnel Fire Scenario (NUREG/CR-6886, PNNL-15313)

Dear Sir/Madam:

The State of Nevada Agency for Nuclear Projects is submitting additional comments on NUREG/CR-6886. We previously submitted preliminary comments on this draft report via our letter to Mr. Allen Hansen, Spent Fuel Project Office, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, on October 27, 2005. We request that our October 2005 letter and attachments be incorporated into the current record of comments on NUREG/CR-6886.

We appreciate the 60-day extension of the original comment period. Due to the complexity of this report and the supporting documents, we have still not fully completed our reviews. In order to comply with the December 30, 2005, deadline, we are submitting the following summary comments. We intend to submit additional documentation, in support of each of these comments, in about 10 days.

1. The final version of NUREG/CR-6886 should include an expanded introductory section summarizing previous NRC studies of spent fuel shipping cask response to severe fire environments, including an explanation of the relationship between this report and NUREG/CR-6672 (SAND2000-0234).
2. The final version of NUREG/CR-6886 should include a more detailed discussion of the Nation Transportation Safety Board (NTSB) investigation of the Baltimore Tunnel Fire, including the NTSB safety recommendations (R-04-15 and -16, issued

January 5, 2005) and the NTSB decision not to issue an official report on the cause and history of the fire.

3. The final version of NUREG/CR-6886 should include a detailed discussion of the 2001 analysis of the Baltimore Tunnel Fire prepared by Radioactive Waste Management Associates for the State of Nevada.
4. The final version of NUREG/CR-6886 should include a detailed discussion of the 2002 analysis of the Baltimore Tunnel Fire prepared by the U.S. Department of Energy as part of the Final Environmental Impact Statement for Yucca Mountain (DOE/EIS-0250).
5. The final version of NUREG/CR-6886 should include side-by-side fire transient results and consequence analyses of the NAC LWT cask, with and without enclosure in an ISO container. (The discussion at page 7.17 implies that these analyses were performed, but they apparently were not reported.)
6. The final version of NUREG/CR-6886 should include an additional cask analysis, parallel to the approach described in Section 5, of a General Atomics GA-4 legal-weight truck cask, shipped on a rail car without enclosure in an ISO container.
7. The final version of NUREG/CR-6886 should include an additional thermal analysis for each of the four casks, parallel to the approach described in Section 5, assuming that the cask is located 5 meters (16 feet) from the fire center.
8. The final version of NUREG/CR-6886 should include an additional thermal analysis for each of the four casks, parallel to the approach described in Section 5, assuming that the cask is located within the hottest region of the fire.
9. The final version of NUREG/CR-6886 should include a reexamination of the potential for fuel cladding failure and release of radioactive materials, including fission products, at temperatures below the projected burst temperature of 1382°F (750°C) for Zircaloy cladding. (Additional attention should be given to the presence of older fuel with brittle and/or previously failed cladding.)
10. The final version of NUREG/CR-6886 should include a reexamination of the potential for fuel cladding failure and release of radioactive materials for higher burn-up fuels, specifically addressing the issues of radiation embrittlement, pellet degradation due to thermal cycling, and fission product buildup.
11. The final version of NUREG/CR-6886 should include a reexamination of the potential for release of radioactive materials for fuel assemblies with higher levels of CRUD activity (e.g., BWR assemblies with surface concentration up to 150  $\mu\text{Ci}/\text{cm}^2$ ).
12. The final version of NUREG/CR-6886 should include a reexamination of the mechanisms for seal failure and release of radioactive materials, including seal failure long before maximum seal temperatures are reached, bolt failure, and pressure-induced blowout of failed seals.

13. The final version of NUREG/CR-6886 should include a reexamination of the role of the HI-STAR 100 train carriage and cask restraints regarding heat shielding and heat conduction.
14. The final version of NUREG/CR-6886 should include a discussion of the emergency response implications, and cask recovery implications, of the predicted damage to the neutron shielding for all three considered casks, and the loss of gamma shielding for the NACLWT.
15. The final version of NUREG/CR-6886 should include a reexamination of the uncertainties associated with the NIST FDS simulations of gas and wall temperatures 20-30 meters from the fire center. (These issues include the construction and benchmarking of the FDS code, selection of the conductivity value for the tunnel bricks, and potential inconsistencies with the materials analyses.)
16. The final version of NUREG/CR-6886 should include a comprehensive analysis of uncertainties in the following factors, and how these uncertainties might affect the results of the consequence assessment: fire size, location, and duration; gas and wall temperatures from the NIST FDS simulations; CNRWA metallurgical analyses; uncertainties in the package models; seal and cladding temperature limits; and heat transfer models for the neutron shield (including gap radiation in charred solid, and boiling heat transfer in liquid) and impact limiters.
17. The final version of NUREG/CR-6886 should include a discussion of any peer reviews conducted for this report, and any peer reviews conducted for two of the major supporting studies, NUREG/CR-6793 (NIST) and NUREG/CR-6799 (CNWRA).

Thank you for your consideration.

Sincerely,



Robert R. Loux  
Executive Director

RRL/cs

cc Governor Guinn  
Nevada Congressional Delegation  
Earl Easton, NRC