Courthouse Annex
801 Clark Street, Suite #4
Ely, Nevada 89301
(775) 289-2341
Fax (775) 289-2544

White Pine County
Board of County Commissioners

5/21/03
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(50)

May 14, 2003

Mr. Michael Lesar
Chief, Rules Review and Directives Branch
Office of Administration
Mail Stop: T-6-D-59
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

RE: Comments on Spent Fuel Transportation Package Performance Study Test Protocols

Dear Mr. Lesar:

The Board of White Pine County Commissioners, through the assistance of their Nuclear Waste Project Office, has reviewed the subject protocols and offers the following comments thereto. White Pine County encourages the Nuclear Regulatory Commission (NRC) to inform the County as to how, if at all, our comments are specifically addressed in the final spent fuel transportation package performance study test protocols to be prepared and implemented by the NRC.

The County offers the following comments which we believe must be addressed in preparing the final Package Performance Study (PPS) protocols. We believe that NRC's efforts to address the following comments within the final protocol will result in a spent fuel transportation package performance study which enables NRC to determine the validity of existing models used to confirm fuel transportation package performance and to better communicate the results of said study to a variety of stakeholders.

General Comments

1. White Pine County fully supports the use of full-scale physical testing (sequential drop, puncture, fire, and immersion) to failure for both truck and rail transportation casks. We believe the information obtained will test the adequacy of NRC regulations and determine the thresholds of the casks, which can be used to help determine mitigative measures in the event of an accident or incident.
2. Physical full-scale testing of rail and truck casks using shoulder-fired weapons should be conducted.
3. Additional partial-scale or model simulations should be conducted for extra-regulatory accidents and low probability, high consequence events.

E-RFDS=ADM-03
all=A. Snyder (AM63)
A.S. Murphy (ASM1)

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4. The Package Performance Study (PPS) is highly technical. It is not clear how NRC intends to communicate the approach of the study to the general public. If the public can not understand the PPS, they are not likely to have confidence in the results. The PPS must give greater consideration as to how the study approach will be communicated to the public.
5. The PPS must also address how model results will be communicated to the general public. NEPA compliance documents are written to a 6th grade reader. NRC should consider describing PPS results in a manner understandable by a 6th grade reader.
6. NRC must demonstrate the absence of bias in model assumptions, data, cask fabrication, testing, result interpretation and presentation of results. The PPS should explain and provide mechanisms for ensuring the absence of bias in the study.
7. The "availability heuristic" of human cognition suggests that people will believe what they have read recently regarding subjects of a highly technical nature. How will NRC mitigate effects of the availability heuristic in communicating PPS results? For example, the public may remember that a corner impact produces a lid seal gap 10 times greater than an end-on impact.
8. If PPS results suggest that finite element modeling does not accurately predict cask responses to impact and/or fire, will enough data be obtained from field tests to improve the models? In such a case, will another round of model valuation result? The PPS should address these possibilities.
9. The final PPS should describe how results obtained from the PPS will be used by NRC (non-regulatory risk assessment, cask certification, public information, regulatory reform (cask design, modeling criteria and assumptions)).

Specific Comments

1. Page ix, 2nd paragraph – It appears the PPS is focused on the 99% of 1% (or very low probability) of possible transportation accidents. Are these accidents also low probability, high consequence? The PPS should provide an example of a high consequence accident and resulting economic impacts. The PPS should be clear on what type of accident it is assessing. Is the intent to demonstrate that the low probability accidents are not high consequence? The PPS should define high consequence.
2. Page ix, 5th paragraph – The previous paragraph suggests that NRC has complete confidence in its cask safety and certification program. In fact, the 5th paragraph states that the PPS is not intended to involve development of new standards. Why then is NRC undertaking the PPS? Which stakeholders and how many stakeholders have expressed concerns of sufficient stature to move NRC to undertake the PPS? Does NRC itself have doubts about the adequacy of analytical methods and data currently used for cask certification and/or risk assessment? These questions should be answered within the final PPS.
3. Page ix, 5th paragraph – Are the "extreme accidents" referred to here within or outside of the 99% of accidents referred to in paragraph 4? The final PPS should be clear on this point.

4. Page x, 1st paragraph – Why is data obtained from item 1 not being used to inform the design of tasks 2 and 3? When will said data be available? The PPS needs to do a better job of explaining the linkage between data obtained from item 1 and the study to be completed through the PPS. Again, it would appear that the results of item 1 are important to the study described in the PPS.
5. Page x, 4th paragraph – The PPS should describe the probability of drop damage versus horizontal damage as a basis for selecting one source of damage over another for analytical purposes. The final PPS should indicate whether the results of Task 1 (see paragraph 1 of Page x) will inform the selection of drop damage versus horizontal damage tests.
6. Page xi, Figure on page – It appears as though the choice of a rounded versus square surface (against which the "back-breaker" test will be performed) should be informed by the results of Task 1 (see paragraph 1 of Page x). The PPS should indicate why Task 1 is not being used for this purpose or Task 1 results should be incorporated into the final PPS.
7. Page xii, 1st full paragraph – NRC is encouraged to consider exposing the cask to fire for a duration resulting in seal failure. Testing to failure will provide important insights as to where the threshold of failure exists.
8. Page xii and xiii, 3rd paragraph, 4th-9th bullets – Again, the results of Task 1 (see paragraph 1 of Page x) should inform these answers. The PPS should indicate when the results of Task 1 will be available for review.
9. Page xiii, 3rd bullet – The PPS should provide an overview of NRC's risk-informed regulatory initiatives. NRC has already determined there to be little risk of release from a shipping cask under the existing regulatory framework. Because the PPS will not involve development of new regulations, it is not clear how PPS results can be considered relevant to risk-informed regulatory initiatives. In fact, is it not possible that undertaking the PPS serves to undermine (by implying some deficiency with existing analytical models) the validity of NRC risk-informed initiatives? A better justification for implementing the PPS appears to be needed.
10. Page 1, 1st paragraph – The PPS should describe how a 9 meter drop compares to actual accident histories.
11. Page 1, 1st paragraph – The final PPS should indicate how a 30 minute, 800 degree fire compares to Baltimore Tunnel fire conditions.
12. Page 1, 3rd paragraph – The final PPS would benefit from a detailed schedule and budget for the six-year work plan. Given that Yucca Mountain licensing may be concluded prior to the six-year timeframe and that there may be only seven years until the first Yucca Mountain related shipments, will the results be available in time for effective use in "risk-informed" decision making by NRC? The final PPS should relate the timing of results to application in managing risk of real shipments to Yucca Mountain. Of particular concern to White Pine County is the potential for PPS results to suggest the need for regulatory reform, a process which may take up to 24 months. Given the need for regulatory reform, enhanced safety benefits may not be available for the first few years of shipments to Yucca Mountain. The final PPS must consider these timing issues.
13. Page 2, Section 1.1 – In addition to "raising a number of technical issues about the performance of spent fuel packages during extreme accidents," NUREG/CR-

6672 also concluded that the risks of transporting SNF/HLW were lower than estimated in previous NRC studies. Will new data from the PPS further reduce what NRC has already determined to be acceptable levels of risk? Given this situation, is the PPS really needed? A better case for the PPS must be included in the final document.

14. Page 4, Section 1.2 – The PPS is not clear as to whether finite element analysis is currently used by NRC for cask certification. If finite element analysis is not currently used, the final PPS should explain why NRC is considering use of the technique now. If finite element analysis is currently utilized for cask certification, the PPS should describe existing deficiencies in current models that can be remedied through the PPS.
15. Page 4, Section 1.2 – The final PPS should explain what information will be provided to whom and in what timeframe and where the public outreach objective will be accomplished.
16. Page 4, Section 1.2 – The final PPS should indicate NRC's hypothesis regarding estimates of risk from incorporation of empirical data or new or updated transport statistics into existing analytical models.
17. Page 5, 1st paragraph – The final PPS should indicate whether detailed test plans will be revised to reflect National Academy of Science comments.
18. Page 5, Section 1.3 – The final PPS should describe how casks to be tested will be selected for test and by whom. The PPS must demonstrate how NRC will guard against apparent bias in the selection/manufacturing of test casks. To enhance public confidence in the testing program, NRC might consider selecting casks for testing that have already been certified and are now in service. In addition, NRC should consider random selection of casks for testing from among those now in service.
19. Page 7, 1st paragraph – The final PPS should indicate whether finite element analysis is currently used by NRC or those seeking NRC certification in modeling cask performance and/or in cask certification proceedings. If not, the PPS should describe the current analytical framework in use and why the current system is being evaluated. If finite element models are in use by NRC, the final PPS should indicate whether a determination that such models are accurate was reached previously by NRC as a means to support their past use by NRC.
20. Page 9, 4th paragraph – White Pine County encourages NRC to require that any new drop facility and unyielding target be constructed and operated at the Nevada Test Site. Such a Nevada-based facility would enhance the ability of those living in the transportation funnel to best access PPS tests. The final PPS should describe how NRC intends to allow stakeholders to observe the tests.
21. Page 11, 2nd paragraph – The final PPS should describe what degree of uncertainty will be associated with the PPS and how NRC will manage and communicate uncertainty. Uncertainty will erode public confidence in test results. Opponents of SNF/HLW transportation will highlight uncertainty in test results to erode public confidence in the PPS.
22. Page 11, 3rd paragraph – The final PPS should explain if, and how frequently, the MPC will be used in SNF/HLW rail and truck transportation. Does incorporation of the MPC reflect the most common transportation scenario for the future? Is

there merit in considering a non-MPC scenario? The final PPS should answer these questions.

23. Page 12, 5th paragraph – As stated previously, the final PPS should consider utilizing existing certified casks which are in service for the tests.
24. Page 12, 5th paragraph – The final PPS must explain how NRC will model various aspects of uncertainty.
25. Page 15, 2nd full paragraph – The design operational relationship (relational performance) of the contents and the canister, the canister and inner shell, the lid and the cask body, and the cask body and the impact limiter must be better explained in the final PPS. The document must indicate whether NRC has considered said operational relationship in specifying assumptions regarding friction.
26. Page 15, 2nd full paragraph – The final PPS should indicate for which aspects of the problem is neglecting friction not conservative.
27. Page 16, 2nd paragraph – Whether a more detailed bolt model will result in a better model for assessment of bolt bending should be specified in the final PPS.
28. Page 16, 2nd paragraph – The final PPS should clearly indicate whether bolt bending is a source of lid displacement (both vertical and horizontal). The draft document is unclear in this regard.
29. Page 16, 3rd paragraph – Whether the proposed analysis will consider displacement of re-alignment of sealing surfaces should be specified in the final PPS. Such consideration would be an important component of the analysis.
30. Page 19, 1st paragraph – The final PPS should specify what the maximum final thickness was following crushing.
31. Page 22, 1st paragraph – The PPS should include an estimate of the extent to which bolt preload would be expected to reduce the closure lid gap resulting from the 96 kph CG-over-corner impact.
32. Page 23, Figure 12 – The final PPS should clearly indicate whether the pre-test lid seal gap is 0 mm. Figure 12 should be clarified as to whether it suggests a closure lid gap separation around the entire circumference of the lid. Why is the lid seal gap for the 180-360 degree portion of the lid not shown on Figure 12?
33. Page 23 – The data here suggests that CG-over-corner impacts pose the greatest risk of closure lid seal gap. NRC is encouraged through the PPS to consider methods to reduce the frequency of CG-over-corner impacts as a means to reduce risk. NRC's intent to give such consideration to this issue should be described in the final PPS.
34. Page 29, 3rd paragraph – The final PPS should indicate whether NRC has considered the extent to which the use of modeling assumptions to avoid numerical complications introduces uncertainty and suggests a possible loss of modeling accuracy. Greater elaboration on managing uncertainty in the final document is required.
35. Page 48, Section 2.6 – The final PPS should explain the basis of the panel's recommendation to use the Holtec Hi-Star 100 and GA-4 casks. A description of other casks that were considered and why their use in testing was not supported should be incorporated into the final PPS.

36. Page 48, Section 2.7 – The final PPS should indicate whether the actual velocity achieved at impact will be known and how said velocity will be determined.
37. Page 52, 4th paragraph – The final PPS should describe how long after initiation of the test the temperature of the outer surface of the package started to approach the temperature of the fire.
38. Page 53, 3rd paragraph – The PPS should indicate whether a test of a calorimeter the size of a rail cask has ever been conducted before and if not, what unique testing problems the scale of the cask might impose. If so, the PPS should describe how the results of such previous studies have been considered by NRC in preparing the PPS.
39. Page 53, 4th paragraph – It is not clear in the PPS whether either of the rail cask positions to be used in the test are the same as that position used for regulatory purposes. The final PPS should clarify this matter.
40. Page 53, 4th paragraph – The final PPS should explain the effect, if any, of the water layer on heat generation.
41. Page 53, 4th paragraph – Whether the heat loss due to the water layer is more or less than heat loss associated with soil and pavement should be explained in the final PPS.
42. Page 53, 4th paragraph – The final PPS should indicate why the truck cask fire test is not being conducted over pavement (the likely surface under a cask fire).
43. Page 54, 1st paragraph – The final PPS should indicate whether any of the models described here are acceptable for use by NRC for cask certification purposes.
44. Page 55, 3rd paragraph – Whether NRC has considered introduction of simulated fuel decay heat to the interior of the cask should be explained in the final PPS. The final PPS should address whether excluding simulated fuel decay heat will result in underestimation of time to seal failure.
45. Page 58, 2nd paragraph – The final PPS should include consideration of evaluating the temperature of seals and time to seal failure.
46. Page 60, 2nd paragraph – See comment #45.
47. Page 64, 4th paragraph – The final PPS should offer an elaborated explanation of how NRC plans to perform the improved estimates of seal degradation and rod failure by burst under extreme fire conditions as described here.
48. Page A-1, 2nd paragraph – The NRC should consider the value of the data described here as informing decisions regarding design of high-speed collision tests and engulfing fire tests. When will said data be available? How will NRC involve stakeholders in review of staff decisions regarding beyond-design-basis accident? These issues need to be addressed within the final PPS.
49. Page A-2, 1st partial paragraph – The statement regarding consistency with information and views during scoping is not true. Views expressed during scoping suggested that the PPS was not needed and would not be an effective means for building public confidence in SNF/HLW transportation. It is not clear how NRC considered such views in drafting the PPS.
50. Page A-2, 2nd paragraph – The final PPS should clarify how tested casks will be chosen to avoid the appearance of selection bias.
51. Page A-3, 3rd paragraph – Given that the annual probabilities associated with the PPS test protocol impact test compare favorably to the probabilities considered in

Part 63 safety or performance assessments, the final PPS should clarify why NRC is proceeding with the PPS given the apparent "acceptable" level of risk associated with extreme transportation accidents.

Please feel free to contact Ms. Josie Larson (775) 289-2033, Director of the White Pine County Nuclear Waste Project Office, should you have any questions regarding these comments.

Sincerely,

David Provost
Chairman

Cc: AUG
State
file