



Department of Energy  
Washington, DC 20585

JUL 20 1992

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Division of High-Level  
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Office of Nuclear Material  
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U.S. Nuclear Regulatory Commission  
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Dear Mr. Holonich:

This is in response to your letters dated June 10, 1992, and June 25, 1992, transmitting the summaries for the U.S. Department of Energy (DOE)/U.S. Nuclear Regulatory Commission (NRC) Technical Exchanges on Waste Form: Spent Reactor Fuel held February 25-26, 1992, and on Air and Vapor Movement Due to Thermal Gradients held on March 17-18, 1992. The summaries, labeled as Enclosure 1, were jointly signed by DOE and NRC. NRC also provided a comprehensive NRC staff summary as Enclosure 2 of each transmittal.

The draft of Enclosure 2 to the Spent Reactor Fuel Technical Exchange had been previously provided to DOE for review and DOE verbally indicated "technical inaccuracies" in the summary. However, the detailed staff summary was included, unrevised, as Enclosure 2. DOE was never informed of the detailed summary prepared by the NRC staff for the Thermal Gradients Technical Exchange and, thus, was not provided with the opportunity to review the summary for technical accuracy.

DOE believes that it was inappropriate for the NRC to include these enclosures. However, we understand that the summaries were prepared because, at these two Technical Exchanges, there were no hardcopies provided of the viewgraphs used during the presentations. The procedure followed in conducting Technical Exchanges has since been modified and from now on, hardcopies of presenters' viewgraphs will be distributed to all Technical Exchange participants, and will be enclosed with jointly signed Technical Exchange summaries.

DOE is currently reviewing the staff summary for the Thermal Gradients Technical Exchange and will inform NRC of any technical corrections. For the record, the following corrections are

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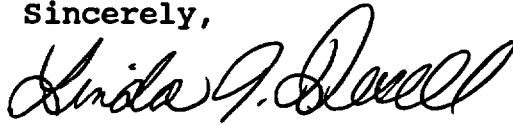
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provided to the information in the NRC staff summary for the Waste Form: Spent Reactor Fuel Technical Exchange:

- 1) Page 1, third paragraph. DOE has not formally established an approach to spent fuel modeling. The items discussed at the Technical Exchange represent the current direction of Lawrence Livermore National Laboratory in this area. Also, modeling is not limited to the worst case scenario; but lack of data in some areas may lead to conservative, bounding assumptions.
- 2) Page 1, fourth paragraph. The presentation was meant to illustrate the time-temperature dependence of oxidation. Given an infinite amount of time, it is expected that the  $\text{UO}_2$  will convert to  $\text{U}_3\text{O}_8$  and possibly hydrated  $\text{UO}_3$  at temperatures both above and below 250 °C. In the process, the fuel will pass through the  $\text{U}_4\text{O}_9$  state that results in slight contractive cracking. It remains to be determined whether the rate of oxidation is sufficient at the lower temperatures to transform the  $\text{U}_4\text{O}_9$  to  $\text{U}_3\text{O}_8$  in a repository-relevant time frame. Current DOE programs are in place to address this problem.
- 3) Page 2, second paragraph. The focus was on degradation of cladding due to different oxide film thicknesses, not oxide film degradation. The C-14 discussions concerned release of C-14 due to cladding degradation, not effects of C-14 on cladding degradations. Finally, hydride reorientation was not dismissed as unimportant; rather, little information is currently available and hydride reorientation may be an important degradation mechanism warranting further exploration.
- 4) Page 2, fourth paragraph. The presentation of these numbers implies that these are absolute limits on time and temperature profiles for lag storage. This type of conclusion is premature. These temperature limits were given as an illustration of how conservative assumptions could be applied to a currently incomplete data base to provide preliminary operating conditions. The talks also stated that with more realistic assumptions, these temperature limits are probably quite a bit higher.

DOE hopes that the above corrections clarify any misunderstanding that the NRC staff had regarding the information presented during the Technical Exchange on Spent Reactor Fuel. If NRC feels that a teleconference with DOE and affected parties to further clarify questions stemming from the presentations is necessary, please contact Cori Macaluso of my staff at (202) 586-2837.

Sincerely,



Linda J. Desell, Chief  
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