Dr. Dana Powers, Chairman
Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
Washington D.C., 20555-0001

December 16, 1999

SUBJECT: SPENT FUEL FIRES ASSOCIATED WITH DECOMMISSIONING

Dear Chairman Powers:

Thank you for your letter of November 12, 1999, on the views of the Advisory Committee on Reactor Safeguards (ACRS) regarding the staff's technical study on spent fuel pool accident risk at decommissioning plants. The Office of Nuclear Reactor Regulation has reviewed your comments and recommendations related to the deterministic and probabilistic aspects of the staff's study and offers the following response.

We agree with the ACRS statements regarding the uncertainties related to oxidation kinetics and heat rejection mechanisms. Both the resolution to Generic Safety Issue 82 and the technical working group draft report acknowledge that these two modeling areas represent a significant source of uncertainty. Since we do not plan to conduct experimental research on oxidation kinetics in air or using bouyancy-driven natural circulation, we will employ conservative assumptions for decay times to account for the uncertainty.

The ACRS states that the uncertainties in the analysis for the critical temperature for the onset of runaway oxidation need to be quantified. We will perform limited sensitivity calculations to estimate the uncertainty in critical decay time and critical temperature due to uncertainties in oxidation and heat removal mechanisms. If needed, we will adjust the critical temperature and decay time to compensate for the lack of knowledge in these areas.

We agree that probabilistic risk assessments (PRAs) should be as realistic as possible in order to provide appropriate insights to the decision making process. Accordingly, we are reassessing the parameter values used in the PRA model and placing emphasis on human error assumptions. Our preliminary risk assessment was intended to scope out areas of potential concern that would then be discussed among the stakeholders. Since that time, we have continued to refine the analysis based upon receipt of additional information, including industry commitments on how spent fuel pool operations will be conducted in the future.

The ACRS suggested the use of probability distributions rather than point estimates as a better way to address the uncertainties in the risk assessment. We plan to develop an approach consistent with the acceptance guidelines in Regulatory Guide (RG) 1.174. This RG proposes that the mean values of the distributions representing the impact of the parameter uncertainties be used to compare with the acceptance guidelines.

The ACRS agreed with the choice of uncovery to the top of the fuel as an appropriate end state for the PRA consequence analysis. However, the staff remains open to alternative end states that may be more realistic and can be justified. Additionally, the ACRS suggested that an

acceptable frequency for this end state would be the same as that for a large, early release frequency (LERF) in RG 1.174. While we have not completed our assessment on risk informed decision making, as we continue to develop our approach in accordance with RG 1.174, we will consider using LERF as you suggest.

Your letter states that this issue may be a good candidate for applying the rationalist regulatory approach as was discussed in your May 19, 1999 report. The appropriate regulatory approach will be decided when rulemaking is initiated and we will consider your suggestion at that time. For our study, we are following the guidelines in RG 1.174 with an emphasis on addressing the most safety significant aspects of the issues. Our study should be compatible with both approaches.

We appreciate the insights the ACRS has provided on the spent fuel pool accident study for decommissioning plants.

Sincerely,

/RA/

William D. Travers
Executive Director for Operations

cc: Chairman Meserve
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
SECY
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