recd 4/19/99

Working Group
Technical Basis Outline

I. Introduction

II. Spent Fuel Pool (SFP) Accident Scenarios

- A. Potential initiating events and accident scenarios that could lead to spent fuel uncovery. (Kelly/Cheok)
- B. Description of each accident scenario. (Jackson)
- C. Human Factors for initiating events and accident scenarios. (Throm)

III. Probabilities of SFP accident scenarios.

- A. Probabilities of accident scenarios that could lead to spent fuel uncovery [based on Susquehanna model]. (Kelly/Cheok)
- B. Seismic hazard curves for sites (Bagchi)
- C. Frequency of heavy load drops and why they happened (Throm)

IV Consequences of SFP accident scenarios.

- A. Dose assessments for time-dependent offsite consequences for a zircaloy fire [based on Millstone 1, and a fire that covers all spent fuel]. (Schaperow)
  1. 30 days with offsite EP and without offsite EP
  2. 90 days with offsite EP and without offsite EP
  3. One year with offsite EP and without offsite EP

  value of this? Cheok: "It's in the

~~A. Evaluation of release fractions due to a zircaloy fire (Schaperow)~~

- B. Consequences of other SFP accident scenarios. (Jackson)
- C. Evaluation of existing accident dose assessments to determine if they represent current operating and storage practices and if they are applicable to decommissioned plants. (O'Brien)

V. Overall Risk of SFP accidents at Decommissioned Plants

- A. Risk at 30 days with offsite EP and without offsite EP
- B. Risk at 90 days with offsite EP and without offsite EP
- C. Risk at one year with offsite EP and without offsite EP

VI. Spent Fuel Pool Heatup Analysis Following Loss of Water

- A. Evaluation of the phenomena of a zircaloy fire (Connell/Eaton)
  1. NRC documentation on zirc fires
  2. UM library for zirc & similar metal fire data

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3. NIST FIREDOC database for zirc & similar metal fire data
4. Contact DOE for data & experience w/fuel cladding fires
5. Contact foreign entities for experience/research w/zirc fires

B. Fuel Failure Criteria (Staudenmeier)

1. Evaluation of 565 degrees C as an appropriate acceptance criterion for analysis and/or,
2. Recommendation on an appropriate temperature

C. Evaluation of existing spent fuel heat up analyses (Jackson/Staudenmeier)

1. Evaluation of GSI-82, SHARP Code, and NUREG-6451
2. Determine if they represent current operating and storage practices, and if they are applicable to decommissioned plants

D. Heatup Calculation Uncertainties and Sensitivities (Staudenmeier)

1. Evaluation of existing computer codes:
2. Determine if they could be used to analyze the heat up of the SFP

C. Critical Decay Times for Reaching a Zirc Fire (Staudenmeier/Boyd)

1. Perform a 2 year/4 year decay time simulation of a generic BWR using the Fluent Code
2. Evaluation of the generic decay times associated with SFP configurations

VII. Structural integrity of the SFP structure (Bagchi)

VIII. Potential for criticality (Kopp)

A. Evaluation of the potential for criticality from accidents
B. Evaluation of the potential for criticality from personnel actions in response to an accident
C. Evaluation of the worst case criticality scenario (i.e., no boral)

IX. Recovery and Mitigative Controls

A. Identify the backup systems that would be available in the event of a loss of SFP water. (Kelly)

B. Effects of mitigative actions on the probabilities of the scenarios (i.e., instruments, procedures, staffing). (Kelly)

C. Evaluation of potential fire protection mitigating controls. (Connell/Eaton)

C. Evaluation of RTM-96 actions for SFP damage (Jackson)

X. Effects of other Programs (Scott)

A. Maintenance Rule
B. Quality Assurance Programs

XI. Comparison of design considerations for Wet-Basin ISFSIs (Jackson)

C. Defense-in-depth
D. Minimum decay time
E. Design events
D. Controls

Independent Spent Fuel Storage Installation (Dry cask onsite and wet storage away from site)

XII. Technical basis for reviewing exemption requests for emergency preparedness at decommissioned plants. (ALL)

A. Identify risk-informed criteria
B. Recommend any administrative or other controls (i.e., enhanced Tss for level, temperature, etc.), if necessary

XIII. Follow up research or other technical support which need to be performed to address any large uncertainties in the available information. (ALL)

A. Internal to the NRC (NRR, NMSS, RES)
B. External to the NRC (i.e., INEL, PNNL, etc.)