

release
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slides

Status of SFP Evaluation

- **Background**
- **Recently completed analysis and testing**
 - MELCOR code results
 - ANL air oxidation testing
- **New activities**
 - NAS review
 - Analysis
 - Testing

Ex 21-5, pollution

H/3

Information in this record was deleted
in accordance with the Freedom of Information
Act, exemptions 215
FOIA 2004-D-2226

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LFS

Ex. 2

Michelle

SFP – Background



- **NRC Vulnerability Project**



Alvarez

SFP – Background

Ex 2

- **Preliminary evaluation (cont)**

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- **Initiated work at ANL to address air oxidation kinetics for preoxidized, hydrided fuel**

- **Review of ‘Alvarez paper’**

Recent Analysis & Testing

- **Completed testing of Zircalloy and Zirlo preoxidized fuel cladding specimens to evaluate oxidation kinetics**
 - Improved data base over the range of 300 – 900 C
- **Ongoing testing addressing hydrided fuel cladding**

New Activities

- **NAS review**
- **Follow up analysis of BWR pool**
 - **Scenario variations**
 - **Geometry changes**
 - **Mitigation strategies**
 - **Consequences analysis**
- **PWR pool analysis**
- **Development of generalized screening criteria**
- **Confirmatory Testing**

2003/12/03

New Activities

- NAS Review

Preliminary public mtg- 12/3/03

Ex. 2

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Ex 5

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Ex 5 [

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NAS Review

- **Proposed 1st Mtg – 2 days**
 - **Opening presentation**
 - **NRC position summary & summary of activities underway (including reactor vulnerability)**
 - **Threat environment and additional security measures**
 - **DBT**
 - **Past spent fuel pool studies**
 - **Assumptions and conservatisms in NUREG- 1738, NUREG/CR-6451 etc**
 - **NRC review of Alvarez paper**

NAS Review

- **Proposed 1st Mtg (cont)**
 - New NRC spent fuel pool studies
 - Analysis of pool damage
 - New NRC cask studies
 - Analysis of cask damage
 - Analysis of fuel response

Ex. 2

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- **Analysis of fuel response**
 - Improved methods
 - Scenarios
 - Analyses (results, insights)
 - Mitigation

New Activities-Testing

- **New testing proposed for confirming spent fuel pool modeling of T/H and accident progression**
- **Confirmation of modeling adequacy**
 - **Natural circulation flow – air flow case**
 - **Laminar flow losses (initial and degrading fuel conditions)**
 - **Base plate and bypass region modeling**
 - **Convective heat transfer**
 - **Radiation heat transfer**
 - **Transient oxidation behavior**

Testing/Preliminary Plans

- **Prototypic configuration**
- **Full scale unfueled assemblies with heater rods**
 - Full height , Natural circulation scaled with same fluid
 - Heater rod vs fuel thermal capacitance
 - Axial power distribution
 - Integral testing with 5 assembly array
 - Pool resistance roughly scaled , downcomer and below rack losses
 - Identical to SE calc configuration
 - Single assembly or sub-assembly for detailed T/H
 - Water addition provisions- confirmation of recovery