

Industry Perspectives on Spent Fuel Pool Criticality Evaluations: Issues and Recent Developments

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Motivations for Amendments

- **Management of neutron absorber degradation in spent fuel pools (e.g. Boraflex, Carborundum, poison inserts)**
- **Reracking**
- **Power uprates (depending on analysis)**
- **New fuel designs (depending on analysis)**

Licensing

- **Regulatory predictability is essential for:**
 - **Efficient processing of licensing actions**
 - **Appropriate resource planning and scheduling**
- **Spent fuel pool criticality licensing actions have suffered from a reduction in regulatory predictability**

Elements of Regulatory Predictability

- **Consistent application of guidance**
- **Conservative engineering analyses**
- **Previously approved technical positions**
- **Defined and adhered to schedules**

Application of Guidance

- **1998, Kopp memo: “Guidance on the Regulatory Requirements for Criticality Analysis of Fuel-Storage at Light Water Reactor Power Plants”**
- **Additional guidance in other documents – single guidance does not exist**
- **Requests for Additional Information are not guidance**

Conservative Engineering Analyses

- **PWR pools contain soluble boron**
 - **If ignoring presence of soluble boron in analysis: $k\text{-eff} < 0.95$**
 - **If considering presence of soluble boron**
 - **$k\text{-eff} < 0.95$**
 - **$k\text{-eff} < 1.0$ under hypothetical complete loss of all soluble boron**
 - **Analysis to demonstrate that dilution of soluble boron would be detected and stopped**

Previous Technical Positions

- **Previous approved analyses**
- **NRC Safety Evaluations**
- **Examples of previous positions**
 - **Code to code comparison acceptable**
 - **Approved k-eff greater than 0.995**
 - **Credit for cell blockers**

Scheduling

- **Stated schedules adhered to by both applicant and NRC**
- **All questions on submitted analysis should be provided in first round of request for additional information**
- **Second round of questions should be reserved for follow-up questions**

The Future

- **Industry engaging EPRI to perform generic criticality studies**
- **Industry looking forward to commenting on ORNL studies**
- **Industry committed to working with NRC to develop guidance and ensure efficiency in the licensing process and regulatory predictability**