

## 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)



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### 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



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## Elements of Regulatory Predictability

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

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## 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

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## 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

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## 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

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## 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

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## 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

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