



United States Nuclear Regulatory Commission

Protecting People and the Environment

Examples of U.S. Research Reactor Safety Analysis and Safety Review

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Introduction (1/1)

- This presentation will cover two examples of safety analysis and safety evaluation
 - Pennsylvania State University research reactor (PSBR) step reactivity accident
 - National Institute of Standards and Technology test reactor (NBSR) loss of primary coolant flow accident

PSBR Overview (1/1)

- **TRIGA reactor licensed to operate at 1 MW steady-state and pulse to 2,000 MW**
- **Pool-type reactor cooled with natural convection**
- **TRIGA fuel elements clad with stainless steel**



PSBR Step Reactivity Accident (1/2)

PSBR Step Reactivity Accident (2/2)

- The safety evaluation states the safety analysis is reasonable
- The safety evaluation states the TS requirements that make the accident unlikely to occur
- The safety evaluation concludes that there will be no fuel damage

NBSR Overview (1/1)

- Test reactor licensed to operate at 20 MW steady-state
- Tank-type reactor cooled with forced convection
- Plate-type fuel elements clad with aluminum

NBSR Loss of Flow Accident (1/2)

- The accident analysis considers multiple initiating events
- The safety analysis uses a benchmarked computer code to analyze the accident progression
- The safety analysis contains conservative assumptions

NBSR Loss of Flow Accident (2/2)

- The safety evaluation states that the safety margin will protect the safety limit
- The safety evaluation states that the analysis is conservative
- The safety evaluation concludes that none of the analyzed loss of primary coolant flow accidents will cause fuel damage

Conclusion (1/1)

- Questions?
- Thank you for your attention.