

Thermal Margins RIRP Crosswalk, Prioritization, and Links to PIRTs

Performance Margins Recommendations

Aladar A. Csontos
Technical Executive

Workshop on Spent Fuel Performance Margins

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NUCLEAR

Overarching Thermal Margins RIRP Objectives

- Objectives:
 - Develop technically defensible consensus-based regulatory guidance to:
 - Establish durable and up-to-date fuel performance metrics to meet NRC regulations requiring protection of cladding from gross ruptures
 - Create a risk-informed graded approach for systems loaded to less than approved licensed limits for operational worker safety improvements
 - Gross rupture PIRT to provide clarity to regulatory expectations prior to loading and for unexpected contingencies during short term operations
- Overall Benefits:
 - Streamlined and more efficient licensing with alternative metrics
 - Greater operational flexibilities with safety enhancements

Thermal Margins RIRP: Licensing vs. Operations

- Develop technically defensible consensus-based topical report to:
 - Licensing: establish durable and up-to-date fuel performance metrics to meet NRC regulations requiring protection of cladding from gross ruptures
 - Operations: create a risk-informed graded approach for systems loaded to less than approved licensed limits for operational worker safety improvements
- Objective not to make licensing more complicated with additional analyses, but, develop a risk-informed and graded approach based on how far the loaded canisters are from design basis limits:
 - How to credit loaded systems with less than design basis heat loads to improve worker safety, e.g. additional shielding blankets, etc.?
 - Minimize delays in loading campaigns for unexpected contingencies during loading and short term operations, e.g. IN 2018-01 events, etc.?

Thermal Margins RIRP Path Forward: Value of PIRTs

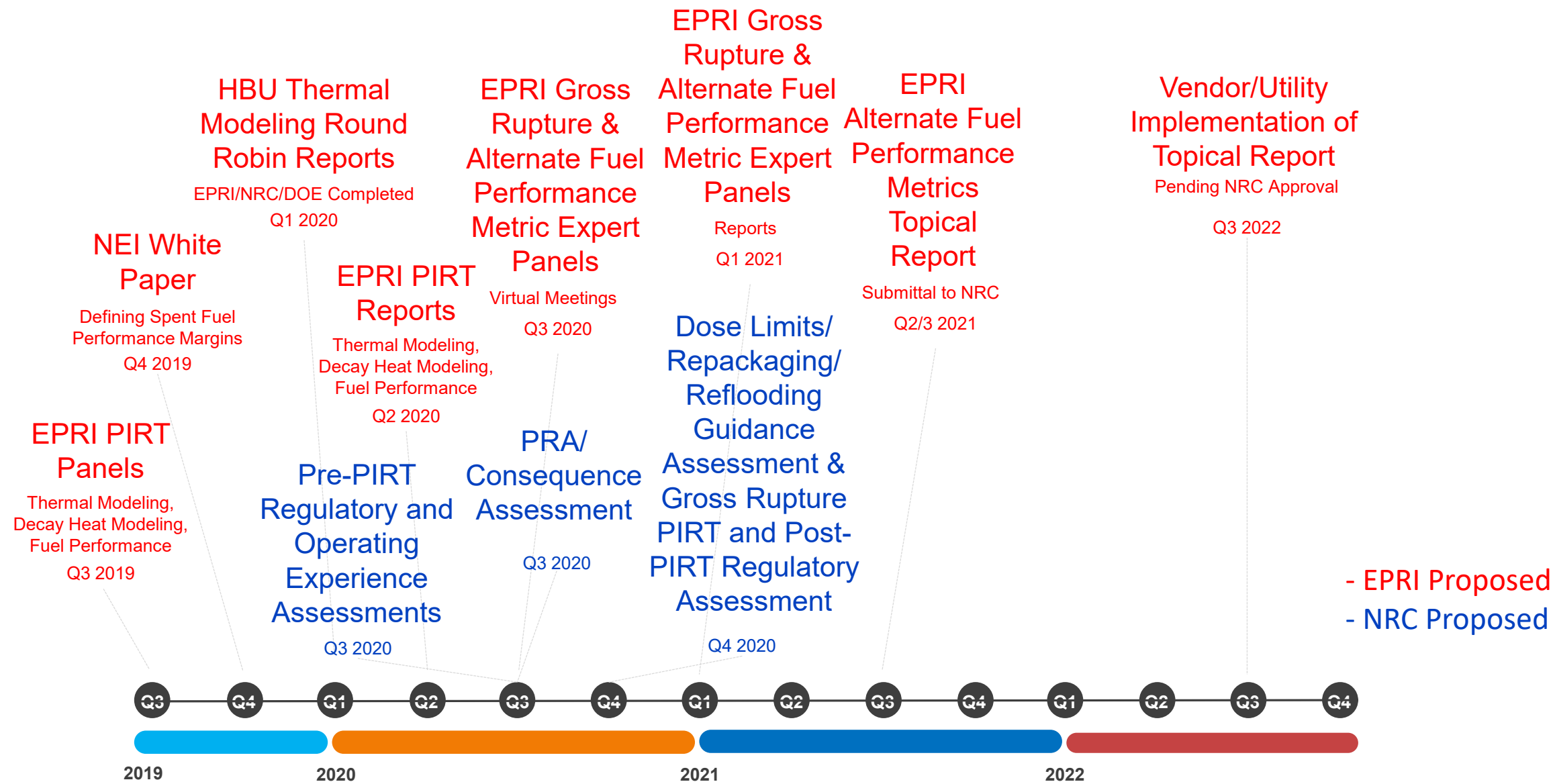
- Phenomena Identification and Ranking Table (PIRT)
 - Structured Expert Elicitation process to identify and rank knowledge gaps
- NRC: White Paper Guidance for Expert Elicitation*
 - Decisions to be made or to develop a decision support model
 - Advantageous to perform an expert elicitation to accelerate development
- To reduce burden, EPRI led the Thermal Modeling, Decay Heat, and Fuel/Cladding Performance PIRTs with NRC and DOE support
 - Followed past NRC established methodology for PIRT expert elicitation
 - Process, structure, and experts vetted by the ESCP Steering Committee
 - EPRI PIRT reports to be publicly available at publication

*NRC, “White Paper: Practical Insights and Lessons Learned on implementing Expert Elicitation,” ML16287A734, October 13th, 2016

Thermal Margins RIRP Path Forward: Gross Rupture PIRT

- Clarification:
 - EPRI and industry seeking clarity on a durable regulatory definition of “gross rupture” for the purpose of establishing up-to-date spent fuel performance criteria to protect the cladding from “gross rupture”
 - Current metric non-actionable with evolving regulatory interpretation
- Benefits of the Gross Rupture PIRT:
 - Inputs to Alternative Fuel Performance Metrics PIRT and topical report
 - Provide clarity to regulatory expectations prior to loading (IN 2018-01) and for unexpected contingencies during short term operations
- To reduce burden, EPRI proposes to moderate the PIRT with the same accepted process to prior PIRTs with NRC and DOE support

High-Level Roadmap



- EPRI Proposed
- NRC Proposed

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