



**US-APWR  
Design Centered Working Group  
Risk-Informed Technical Specifications**

November 3, 2010

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## **Meeting Purpose**

**The purpose of the meeting is to present and discuss the implementation of risk-informed guidance with respect to new reactor risk-informed Technical Specifications (RITS) initiatives, including the development of a detailed plant-specific and broad scope PRA to support RITS initiatives.**

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## Background

MHI and Luminant propose including RITS Initiatives in the DCD and Comanche Peak (CP) RCOL TS applications, including:

- RITS Initiative 4b, Risk-Informed Completion Times (RICT); and,
- RITS Initiative 5b, Surveillance Frequency Control Program (SFCP).

RITS Initiatives 4b and 5b rely on:

risk metrics presented in RG 1.174, RG 1.177, NEI 06-09 & NEI 04-10, and a plant specific PRA.

The CP RCOL TS and SCOL TS must be complete such that the staff can support the Commission's safety finding at COL Issuance, in accordance with existing guidance in DC/COL-ISG-8\*.

\* DC/COL ISG-8, "Technical Specification Information that Combined License Applicants Must Provide in Combined License Applications"

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## Issues with Available Guidance for Operating Reactors

Several issues have been identified in using available guidance in the implementation of programmatic risk-informed applications, such as RMTS, for new reactors. These issues stem from

- Preservation of the enhanced safety of new reactors
- Differences in the timing of the review and approval process between new and operating reactors
- Lack of operational experience for novel features of new reactors (i.e., gas turbines)
- New regulations that require COL licensees to upgrade their PRA to cover initiating events and modes of operation contained in NRC-endorsed consensus standards

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## Implementation Issues for New Reactors

- Preservation of the enhanced safety of new reactors (Modifying the Risk-Informed Regulatory Guidance for New Reactors, SECY-10-0121)
- PRA technical adequacy
- Application-specific infrastructure
- PRA scope and standard
- Uncertainties and performance measurement strategy

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## Proposed Options for Modifying the Risk-Informed Regulatory Guidance for New Reactors

- Option 1: Status Quo; No changes to existing risk-informed guidance.
- Option 2: Implement enhancements to existing guidance to prevent significant decrease in enhanced safety.
- Option 3: Develop lower numeric thresholds for new reactors.

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## Implications of Proposed Options

- Option 1 entails no additional or revised guidelines.
- Option 2 may require and Option 3 will require modifications to requirements documents, regulatory guides, and any supplemental documentation.
- If associated requirements documents, regulatory guides, and supplemental documents need to be revised or developed it will not be possible to complete them in time to support the current RCOL review schedule.

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## Implications of Proposed Options (continued)

- Commission guidance pending.
- However, to minimize the impact to schedule, the COL applicant can propose an acceptable alternative (bounding) approach.
- Regardless, any Option will require addressing the remaining issues, such as an acceptable approach for developing a PRA that will be referenced in the TS. This is likely to be achievable within the current RCOL schedule.

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## **PRA Technical Adequacy**

Risk-informed applications require the availability of a PRA model which realistically reflects, to the extent practicable, the “as built, as-operated” plant

- The required PRA capability depends on the specific application and is identified in application-specific guidance
- The PRA is peer-reviewed according to NRC-endorsed guidance
- Typically, operating reactors requesting NRC approval of programmatic risk-informed applications (e.g., RMTS) have plant-specific PRA models with the required capability available

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## **PRA Technical Adequacy (Continued)**

New reactors requesting NRC approval of programmatic risk-informed applications as part of the COL will not have at the time of the COL issuance a PRA model that is capable to support these applications

- “As built, as operated” information is not available
- DC and COL PRAs are typically not detailed enough to support programmatic risk-informed applications
- Risk-informed applications may have specific PRA requirements (e.g., for RMTS the PRA should be capable of assessing configuration-specific impacts)
- A plant-specific PRA with the required capability must be available prior to fuel load

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## **PRA Technical Adequacy (Continued)**

There must be reasonable assurance at the time of COL issuance that a PRA model capable to support the proposed RMTS programs will be available before fuel load.

This reasonable assurance could be provided by a COL applicant specifically addressing the unavailability of information at the COL stage with respect to the criteria in application-specific guidance.

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## **Application-Specific Infrastructure**

New reactors requesting NRC approval of programmatic risk-informed applications as part of the COL will not have at the time of COL issuance the infrastructure needed to support the implementation of these applications

- An example of needed infrastructure of the RMTS program is a tool to calculate configuration-specific impacts
- All needed infrastructure must be available prior to fuel load
- NRC inspection of infrastructure

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## **PRA Scope and Standard**

For new reactors, 10 CFR 50.71(h)(1) requires that the PRA must cover those initiating events and modes of operation for which NRC-endorsed consensus standards on PRA exist one year prior to the initial loading of fuel

Consensus standards are available for external events and internal fires and floods and are being developed for level 2 PRA and other modes of operation

Current application-specific guidance applicable to operating reactors, regarding initiating events and modes of operation lacking detailed PRA modeling, must be addressed.

This issue can be addressed by a COL licensee using the available detailed PRA model in the implementation of RMTS programs

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## **Uncertainties and Performance Measurement Strategy**

Important elements of risk-informed decision-making are

- Identify and address important sources of uncertainty
- Monitor the impact of changes

Although available guidance applies also to new reactors, additional guidance is needed to account for the lack of plant-specific operational experience and experience with novel design features

This issue can be addressed by expanding the scope of the identification of key sources of uncertainty for new reactors to include the lack of plant-specific experience and the lack of significant experience with some novel design features

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## Summary

- NRC staff is considering the following options for COL applicants considering the adoption of the RMTS Initiatives 4b and 5b, in accordance with DC/COL ISG-8 :
  - any necessary revisions to the conditions, guidance and requirements presented in NEI 06-09 and NEI 04-10, Regulatory Guide (RG) 1.174, and RG 1.177, and an acceptable approach for developing a PRA to comply with 10 CFR 50.71(h)(1) to be referenced in TS, must be completed by the time of COL issuance;OR
  - the COL applicant must develop an alternative approach and any supplemental documentation that are acceptable to the NRC;OR
  - consider a license amendment after COL issuance.