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SMR-300 Reliability Assurance Program

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[Not Export Controlled]

Meeting Agenda

- Introductions
- Purpose & Outcome
- Guidance
- Overview of SMR-300 Reliability Assurance Program
- Open Forum

Introductions

- NRC Staff
- Holtec Staff

Purpose and Outcome

- To provide a high-level overview of the SMR-300 of the Design Reliability Assurance Program (RAP)
- To describe how QA is applied to RAP SSCs
- Obtain feedback from NRC staff

Guidance

- Section 17.4 of NUREG-0800, “Reliability Assurance Program”
  - “Should be implemented according to recommendations of SECY-95-132, “Policy and Technical Issues Associated with the RTNSS in Passive Plant Designs,” Item E, “Reliability Assurance Program,” approved by the Commission in the SRM to SECY-95-132 (June 28, 1995).”

Question for NRC Staff:

- Are there additional guidance documents available for RAP for Part 50 applicants? Anything in development?
- What can SMR-300 expect from the NRC for review of the scope and implementation of RAP for non-safety-related SSCs within that program (e.g., timeline and relevant IPs)?

Interpretation of SRP 17.4 for Part 50

- A.1/B.1, Description of Plant-Specific RAP
- A.2, Programmatic Controls of RAP
- A.3, Methodology for Identifying SSCs within RAP scope
- A.4, Expert Panels
- A.5, SSCs within RAP scope
- A.6, Process for Determining Dominant Failure Modes (*Deferring to FSAR/OLA)*
- A.7/B.2, QA Associated with Design and Construction Activities
- B.3, Integration of Reliability Assurance Program into Operational Programs (*Deferring to FSAR/OLA*)
- ~~A.8/B.4, ITAAC for RAP~~ (*not applicable to Part 50 applications*)
- ~~A.9, COL Action Items~~ (*not applicable to Part 50 applications*)

A.1/B.1, Description of RAP

- Purpose and Objective
  - Identify applicable SSCs (i.e., risk significant SSCs)
    - Risk significant SSCs identified using a combination of probabilistic, deterministic, and other methods of analysis to identify and quantify risk. Qualitatively screened through Expert Panel.
  - Maintain and control the RAP SSCs
    - Implement appropriate QA programs during design and construction activities
    - Provide reasonable assurance the plant is designed and constructed in a manner consistent with risk insights and key assumptions
    - Ensure risk significant SSCs do not degrade to an unacceptable level of reliability or availability and function reliably when called upon

➢ Identifying, maintaining, and controlling SSCs commensurate to risk significance during design and construction

A.2, Programmatic Controls

- Organizations
- Design Control
- Procedures and Instructions
- Corrective actions process
- Records
- Audits

Question for NRC Staff:

SMR-300 QAPD Licensing Topical Report (under NRC review) includes these items. Part II of the QAPD will be applied to safety-related RAP SSCs, while Part III of the QAPD will be applied to non safety-related RAP SSCs. Does the NRC Staff expect additional programmatic controls beyond the QAPD be applied to RAP SSCs?

A.3, Scoping Methodology

- Risk-Significance Methodology Licensing Topic Report (HI-2230875, under NRC review)
  - ✔ Internal and external hazards (fire, seismic, flood, etc.)
  - ✔ Normal power operations
  - ✔ Low power and shutdown
  - ✔ Safety-related and non safety-related SSCs
- Severe Accident Evaluations
- Operating Experience
- RTNSS (SRP 19.3)
- Expert Panel (A.4)

Question for NRC Staff:

Some SSCs (e.g., Fire Protection) may not meet the RAP scoping criteria but would be subject to the SMR-300 non-safety-related QA program (Part III of SMR-300 QAPD), should these be explicitly identified as RAP SSCs?

A.4, Expert Panels

- At a minimum, PRA/PSA, DSA, Operations, Systems, Mechanical, and Electrical/I&C groups will participate in SMR-300 Expert Panel
  - Will discuss qualification requirements
  - Responsible for verifying risk-significant/RAP SSCs and making changes as needed
  - Functional requirements clearly provided for decision-making
  - Specific requirements specified in procedure and instructions, with documentation
- Analogous to Maintenance Rule Expert Panel
  - Expertise oversight, insights, approval, documentation

Question for NRC Staff:

Is there guidance for RAP Expert Panel formation or responsibilities outside of SRP 17.4? Does the NRC Staff assess the guidance available for Maintenance Rule Expert Panel (RG 1.160/NUMARC 93-01) as a reasonable comparison?

A.5, RAP SSCs Identified

- Provide the following in the PSAR:
  - List of RAP SSCs including bases for selection
  - SSC boundaries, as applicable

Questions for NRC Staff:

Additional SSCs may be identified and added to the RAP subsequent to CPA submittal and/or approval (e.g., additional insights become available for expert panel consideration during simulator development). SMR does not intend to identify updates to the RAP SSC list to the NRC outside of future licensing submittals (i.e., OLA). Does the NRC Staff have any concerns with this?

A.6, Dominant Failure Modes

- SMR intends to defer these aspects to the FSAR/OLA based on usage in future operational programs (e.g., MRule performance goals)
- Process for determining dominant failure modes leveraging:
  - Operating experience
  - PRA importance measures
  - Root cause analysis
  - Failure Modes and Effects Analysis

- Dominant failure modes will be identified in the FSAR to provide input to operational programs (MRule)

Question for NRC Staff:

Does the NRC Staff have a concern with deferring this scope to the FSAR/OLA?

A.7/B.2, Quality Assurance

- Safety-related RAP SSCs will be subject to SMR QAPD Licensing Topical Report (HI-2230815, under NRC review) Part II

- Nonsafety-related RAP SSCs will be subject to SMR QAPD Licensing Topical Report Part III

B.3, Transition from RAP to Operations

- SMR intends to defer these aspects to the FSAR/OLA
- RAP to be integrated into operational programs, program and layout are to align with MRule approach
  - ✓ System functions and designations remain (permits smooth integration)
  - ✓ Dominant failure modes used to identify reliability assurance activities
  - ✓ Performance criteria and monitoring goals added

Question for NRC Staff:

- SRP 17.4 details transition upon initial fuel load, which is consistent with the expected start of MRule. Is there an expectation for a separate "operational" RAP (O-RAP) after transition to MRule?
- SMR does not intend to integrate all RAP SSCs within MRule by default. MRule SSCs will be scoped in accordance with 50.65(b). Is the NRC Staff's expectation that all RAP SSCs will be in the MRule?

Open Forum