NRR-DMPSPEm Resource

From: Miller, Ed
Sent: Wednesday, January 24, 2018 3:25 PM
To: Miller, Ed
Subject: Jan 24, 2018, Public Meeting with NEI Re: New PRA Methods
Attachments: NRC staff slides Jan 24 2018 Public Meeting.pdf

NRC presentation slides for the subject meeting attached.

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Newly Developed Methods

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Newly Developed Methods Overview

- Currently not directly addressed in ASME Standard
- RG 1.200 calls for submittal and staff review of key assumptions, i.e., key sources of model uncertainty
  - Guidance defines selecting from alternative consensus methods as key source of uncertainly when the results can be affected

Newly Developed Methods Overview

- Once a LAR authorizing use of future PRA estimates is issued, acceptability of future new PRA method changes are not addressed by RG 1.200 or the current ASME Standard
- NRC review of newly developed methods can be requested with a topical, a FAQ, a LAR, or other submittal
- NRC experience has been that acceptability necessitated modifying or constraining most industry proposed new methods

Examples of major PRA methods modified by NRC Review

- Fire escape from well-sealed robustly secured MCC cabinets > 440V
  - FAQ 14-0009 changed practice from assumption of 0 probability that fire escapes a well-sealed cabinet to a 0.23 bounding value and range of values down to 0.04 depending on types of cables within and above the cabinet.
- Weighting factors for transient and hot work fire modifications
  - Original NUREG/CR-6850 provided only three integer weighting factors
  - FAQ 12-0064 provided greater resolution without any “adjustment factors”
  - FAQ 14-0007 incorporating floor area into factors.

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Examples of major PRA methods modified by NRC Review

- Failure of “traditional” RCP seals in original Internal Events PRA, i.e., IPE and IPEEEs in the late ‘80s and 90s.
  - Failure of RCP seal cooling leading to failure of RCP seals is an important but complex time versus leakage issue
- NRC approval of WCAP-15603 (WOG-2000) model in 2001 changed, among others,
  - Increased third stage seal failure probability given second stage has failed from 0.54 to 1.0,
  - added requirement to demonstrate capability to rapidly cool down or to change 0 O-ring failure probability to 0.5,
  - moved initial leakage from 30 minutes to 13 minutes,

Definitions of New Method

"A PRA method is new if it has not been reviewed by the NRC staff." (NRC Acceptance On NEI Appendix X to Guidance 05-04, 07-12, And 12-13, Close-out of Facts and Observations (F&Os) ML17079A427)

Acceptance of Newly Developed Methods

- Risk-Informed Steering Committee Working Group 1 (RISC WG 1) was tasked to develop guidance on newly developed methods
  - Resulted in Vetting Panel process as path forward
  - RISC WG 1 included input from staff in NRR, NRO, and RES
- Revisiting process for accepting newly developed methods would require reconvening RISC WG 1

Future Options under Consideration for 4b

- Option 1: Improve NRC Review and approval of newly developed PRA methods (i.e., vetting panel process)
- Option 2: Develop guidance that only significant newly developed methods need to be reviewed and approved
- Option 3: Conceptual Industry Proposal for Newly Developed Methods

Option 1: Pilot Vetting Panel Process

- Strengths:
  - Consensus approach limits resources required from both NRC and Industry
  - Resources already expended to review industry guidance and 3 pilot methods already received fee waiver
  - Provides central repository of acceptable methods (formal documents in ADAMS)
- Weakness:
  - Unclear how resource reduction over current processes can be achieved
  - Approval criteria need to be developed and added to guidance document
  - Fee waiver took several months to issue for the pilot methods

Option 2: Limit License Condition to "Significant" Methods

- Strengths
  - Focuses review resources on significant methods and away from insignificant methods
  - Less resource burden on both NRC and industry
- Weaknesses
  - Significance difficult to define (e.g., %, risk metric)
  - Significant would likely vary from plant to plant
  - Cumulative effect will also be difficult to include

Option 3: Conceptual Industry Proposal for Newly Developed Methods

- Peer Review of PRA upgrades (includes newly developed methods). Licensee provides summary of scope of upgrades to NRC before use
- Necessitates a framework that does not currently exist
  - Undefined criteria and timeline regarding reporting, and NRC review, acceptance, and non-acceptance
  - Fee schedule would have to be established (Licensee pay for the review, would licensee request a fee waiver, etc.?)
  - Undefined NRC/Licensee interaction after (possibly delayed) determination of un-acceptable methods

Summary

- PRAs are increasingly important in the licensing bases (4b, 50.69)
- NRC needs reasonable confidence that plant PRAs will retain technical acceptability in the future
- A license condition that only allows use of NRC accepted PRA methods will provide this confidence
- Addressing unreviewed and unacceptable methods after implementation requires investigation
- Options 2 and 3 will require resources to develop and reconvening RISC WG 1 to establish framework
- Industry should provide justification for the expenditure of NRC resources