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PRA FACT AND OBSERVATION CLOSURE REVIEWS FOR RISK-INFORMED LICENSE AMENDMENT APPLICATIONS

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AGENDA

OVERVIEW OF STEPS AND RESOURCES FOR CATEGORIZATION

- History
- Purpose and Ground Rules
- Exelon Fleet Pilot Review Process
- Focused-Scope review
- Insights and Lessons Learned
- NRC interactions
- Conclusions



HISTORY

- There has been longstanding concerns about PRA Finding closeouts to support future LARs
- In 2016 Exelon and JENSEN HUGHES embarked on a process to setup closure review teams (using personnel independent of the PRA in question).
- Closure review teams were to follow a common process to reduce the number of “Findings of Record.” Options originally considered included:
 - Closeout F&Os in a peer review
 - Closeout F&Os by NRC review
 - Closeout F&Os by independent assessment



HISTORY

▪ Peer Review:

- In this option, the host utility performs another full or a focused-scope peer review, to be conducted in accordance with the NEI peer review guidance.
- During the new peer review, as part of the peer review scope, a new peer review team determines whether the previous F&Os covered by the scope of the new review have been addressed adequately to be closed out.
- Following conduct of the new peer review, the previous F&Os within the scope of the peer review are considered closed (assuming the new peer review team confirms this), and need not be addressed in risk-informed applications of the PRA.
- The supporting requirements (SRs) affected by those F&Os are also reassessed as part of the peer review, and previous assessments of in-scope SRs as less than Capability Category (CC) II are no longer relevant.



HISTORY

- **NRC Review:**

- In this option, to close out the F&Os in question through an NRC application, the host utility would:
 - Address the F&Os in question prior to the application submittal.
 - Specify in the submittal that close out of these F&Os by NRC is requested as part of the application review.
 - Submit documentation of the F&O resolution to the NRC with the application.

- **The NRC would be requested to document acceptance of the F&O resolution on the public docket as part of the application review.**

- Note that this option was not pursued as the NRC review process was believed to be too uncertain and potentially costly.



HISTORY

- **Independent Assessment**

- In this option, an independent assessment is conducted in a manner similar to a peer review, but with a scope limited to evaluating the closure of specific F&Os identified by the host utility, and no new F&Os are issued.



INDEPENDENT ASSESSMENT PURPOSE AND GROUND RULES

- Perform focused-scope independent assessments to review closeout of “Finding” level facts and observations (F&Os) from prior peer reviews
 - Used to support future License Amendment Request (LAR) submittals
 - Closed findings no longer relevant to current PRA model and need not be discussed in future LAR submittals
- Not a peer review, but some similarities
 - Reviewing past Findings, not Supporting Requirements
 - Past Suggestions are out-of-scope
 - Reviewer qualifications are same as for peer reviews
 - Two qualified reviewers per Finding
 - Findings are Resolved, Partially Resolved, Partially Resolved w Open Documentation, Open, or Not Reviewed
 - Maintenance or Upgrade
 - Recommendations and Suggestions



INDEPENDENT ASSESSMENT PURPOSE AND GROUND RULES

■ Maintenance vs. Upgrade

- PRA maintenance: the update of the PRA models to reflect plant changes such as modifications, procedure changes, or plant performance (data).
- PRA upgrade: the incorporation into a PRA model of a **new methodology or changes in scope or capability that impact the significant accident sequences or the significant accident progression sequences.**
 - This could include items such as new human error analysis methodology, new data update methods, new approaches to quantification or truncation, or new treatment of common cause failure.



REVIEW PROCESS

▪ Exelon fleet pilot process

- List of findings to be reviewed are developed
- Select review team members with proper qualifications
- Develop review assignments and schedule
- Initial documentation provided to review team
 - » Peer review reports
 - » Self assessment/roadmap to resolution of findings
 - » PRA notebooks
 - » Models
- Initial review and questions (question form)
- Onsite review, questions, and daily consensus sessions (flexible based on scope)
- Post-visit review exchanges (weeks, not months)
- Issue final report



FOCUSED-SCOPE REVIEW

- **Embedded focused-scope peer review (Exelon second pilot)**
 - Exelon identified that the way the site addressed certain findings constituted an Upgrade
 - » THIEF to determine time to cable failure instead of a prior method which utilized a damage accrual method with data from NUREG/CR-6850 Appendix H.
 - » FLASHCAT credits cable tray burn duration in some fire modeling calculations whereas it previously did not
 - » Automatic Detection Time Calculations calculates the time to automatic detection actuation whereas it previously did not
 - In accordance with the requirements of the ASME/ANS standard and Exelon procedures, a focused-scope peer review was needed
 - Peer review was conducted in accordance NEI 05-04 / 07-12
 - » Exelon identified affected HLRs
 - » Peer review team identified affected SRs within the HLRs
 - » Assessment of each affected SR performed and F&Os issued as appropriate



INSIGHTS

- **Several insights and lessons learned from Exelon pilots**
 - Piloted both remote review and embedded focused-scope review
 - » More difficult than anticipated
 - Detailed self-assessment and roadmap helpful
 - » What exactly was done
 - » Where to find the “string” (specific sections and tables of documents, gate names, BE names, etc.)
 - Although the focus is on the specifics of the Finding, the SR words are very important
 - F&O closure review teams’ assessment of the adequacy of the station’s Finding resolution can be easy to difficult
 - Have a review plan and pre-job briefing to align everyone on assignments, timelines and expectations



MORE INSIGHTS

■ Off-site review and multi-part F&Os:

- Piloted an off-site review (for one element - the circuit analysis) with a WebEx consensus session with the entire team.
- Difficulty dedicating blocks of time to support the remote review. Remote reviewers likely to be in demand for other projects.
 - » On-site review forces dedicated review time.
- Need accurate estimate of hours required for review time for multi-part F&Os.



MORE INSIGHTS

▪ Additional Insights:

- Posting model files and notebook well in advance helpful
- Have the right host technical staff and working model on computer
- Inconsistent interpretations of the standard going back many years is an issue
- Retain a database of the questions and responses
- NRC Observation: When is a resolution an upgrade? Is this F&O closure review the appropriate process if that is the case?



INTERACTING WITH NRC DURING F&O CLOSURE REVIEWS

▪ NRC Participation

- The host should designate a liaison person to interact with the NRC observers during the closure review.
- The liaison should communicate early with the NRC through an NEI representative to understand NRC needs and expectations for the review week to allow adequate time to make necessary arrangements and supply requested information.
- NRC should receive a copy of the closure review plan, including the review schedule; the names of the F&O Technical Review Team members and their assigned areas of review, and the list of Finding level F&Os supplied by the host utility.



INTERACTING WITH NRC DURING F&O CLOSURE REVIEWS

■ NRC Participation

- NRC would likely want to be situated in the same conference room as the review team during the review week to observe the process.
- One key discussion point during NRC's exit meeting was whether the review team, in resolving a particular Finding, was in fact approving a PRA upgrade.
- The NRC commented that the review team should not be precluded from issuing a Finding if the review team considered that warranted.
 - » Recommendations and suggestions were included in the review teams' disposition of issues as appropriate.
- The NRC reiterated that the team should re-review the associated Supporting Requirement for Findings that are resolved to ensure that any re-categorization of Capability Categories are appropriate.



CONCLUSION

SUMMARY

- “Finding” level F&O closure reviews are recommended to support risk-informed license amendment applications
- Exelon fleet pilot process successful and used to help develop NRC-endorsed closure review guidance (i.e., “Appendix X”)
- Consider whether resolution of a Finding constitutes an “Upgrade” as defined in the PRA Standard
- Planning for the review is very important



QUESTIONS?

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