

# Closure of PRA Peer Review Facts and Observations

Regulatory Information Conference  
Technical Session TH35

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# Outline

- ☐ Background: New Process for closure of F&Os Industry Guidance and Processes
- ☐ PRA Processes for Regulatory Review
- ☐ Overview of Appendix X: Closure of F&Os Process
- ☐ Industry Pilots and Staff Observations
- ☐ Staff Acceptance of Appendix X
- ☐ Post Acceptance Observations
- ☐ NRC Audits: Crediting F&O Closure
- ☐ Proposed Staff Endorsement in RG 1.200, Revision 3

# RISC Working Group 1

- **Background:** The Risk Informed Steering Committee (RISC) identified several high-priority issues to foster an environment conducive to achieving the full benefit of risk-informed regulation.
  - Common theme was difficulty associated with evaluation of Probabilistic Risk Assessment (PRA) technical acceptability in review of risk-informed licensing applications
- **Working Group 1 Issue 2 Objective:** *Improve process for documentation and closure of Peer Review Facts and Observations (F&Os)*

# Industry Guidance and Processes for PRA Acceptance

## ASME/ANS PRA Standard

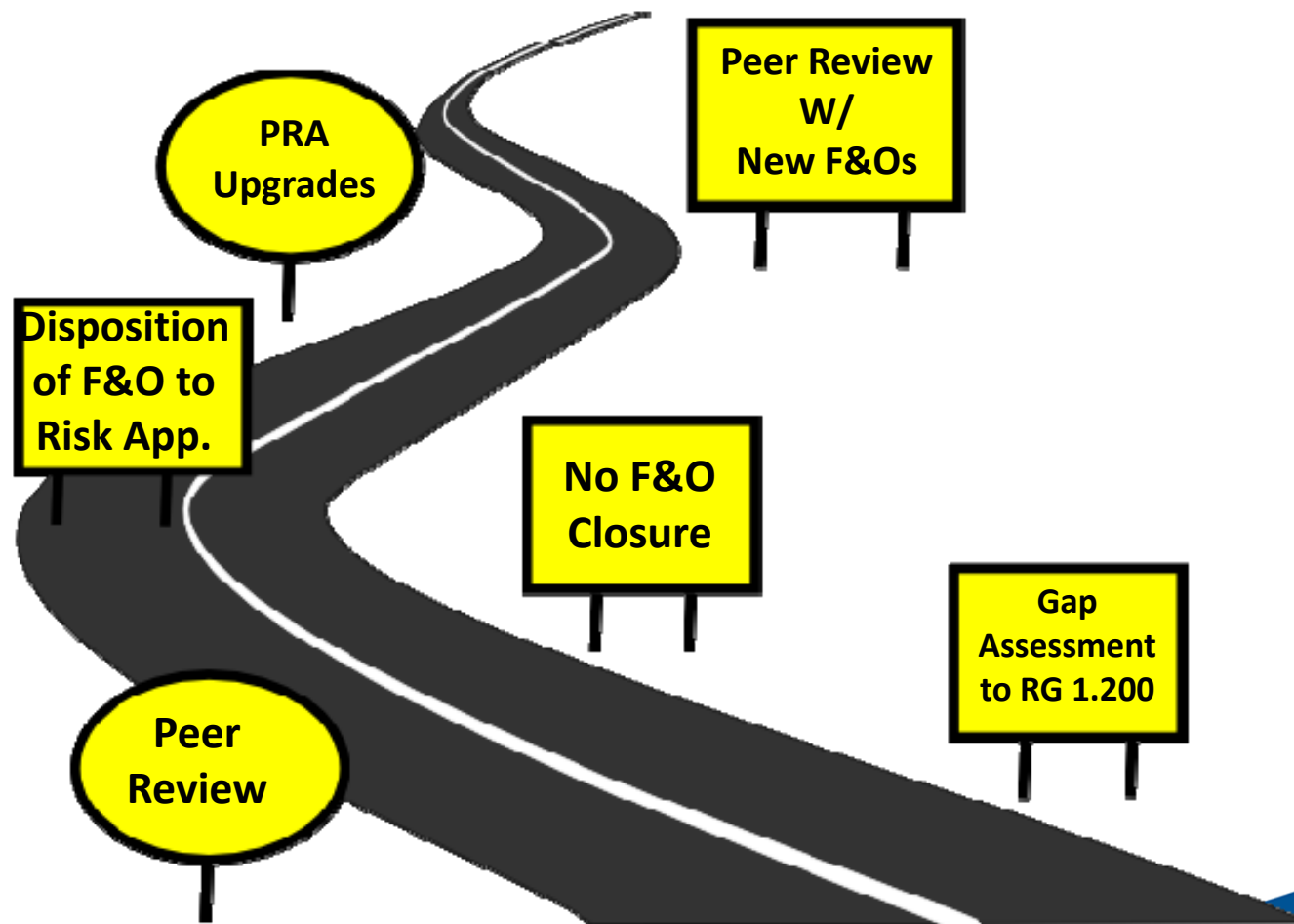
- Provides standards for peer review of a PRA to be used in risk-informed decisions for commercial nuclear power plants.
- Defines PRA upgrades and stipulates when a peer review should be performed.
- Peer Review
  - Inherently establishes PRA model-of-record (MOR)

## NEI 05-04/07-12/12-16

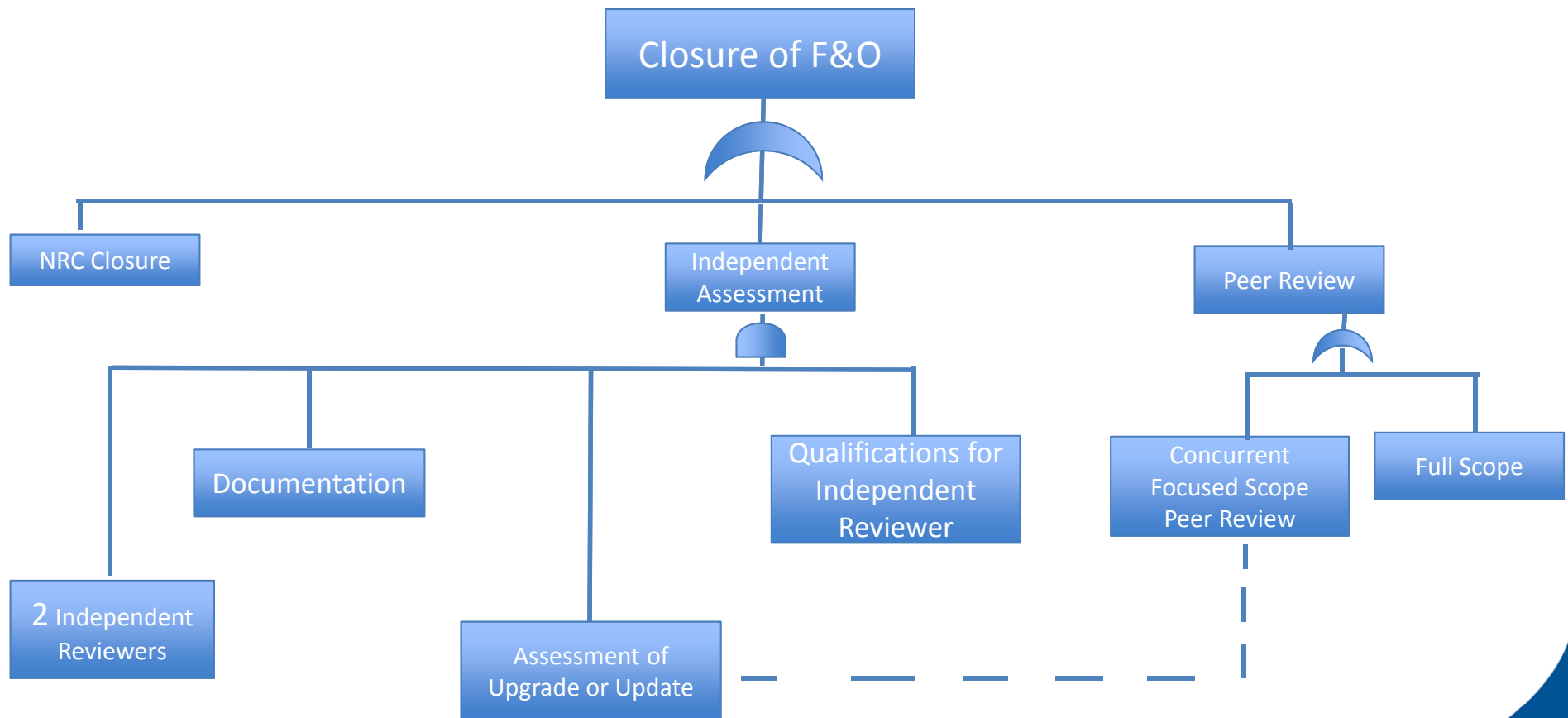
- Guidance for Peer Review Process
  - Assessment of the Capability Category (CC) of the Supporting Requirements (SR), CC-I, CC-II, CC-III
- Full Scope
- Focused Scope
- Gap Assessment to RG 1.200
- Defines levels of F&Os
  - Findings
  - Observations
  - Best Practices

# PRA Processes for Regulatory Review

## RG 1.200 and RG 1.174



# Overview of NEI Appendix X

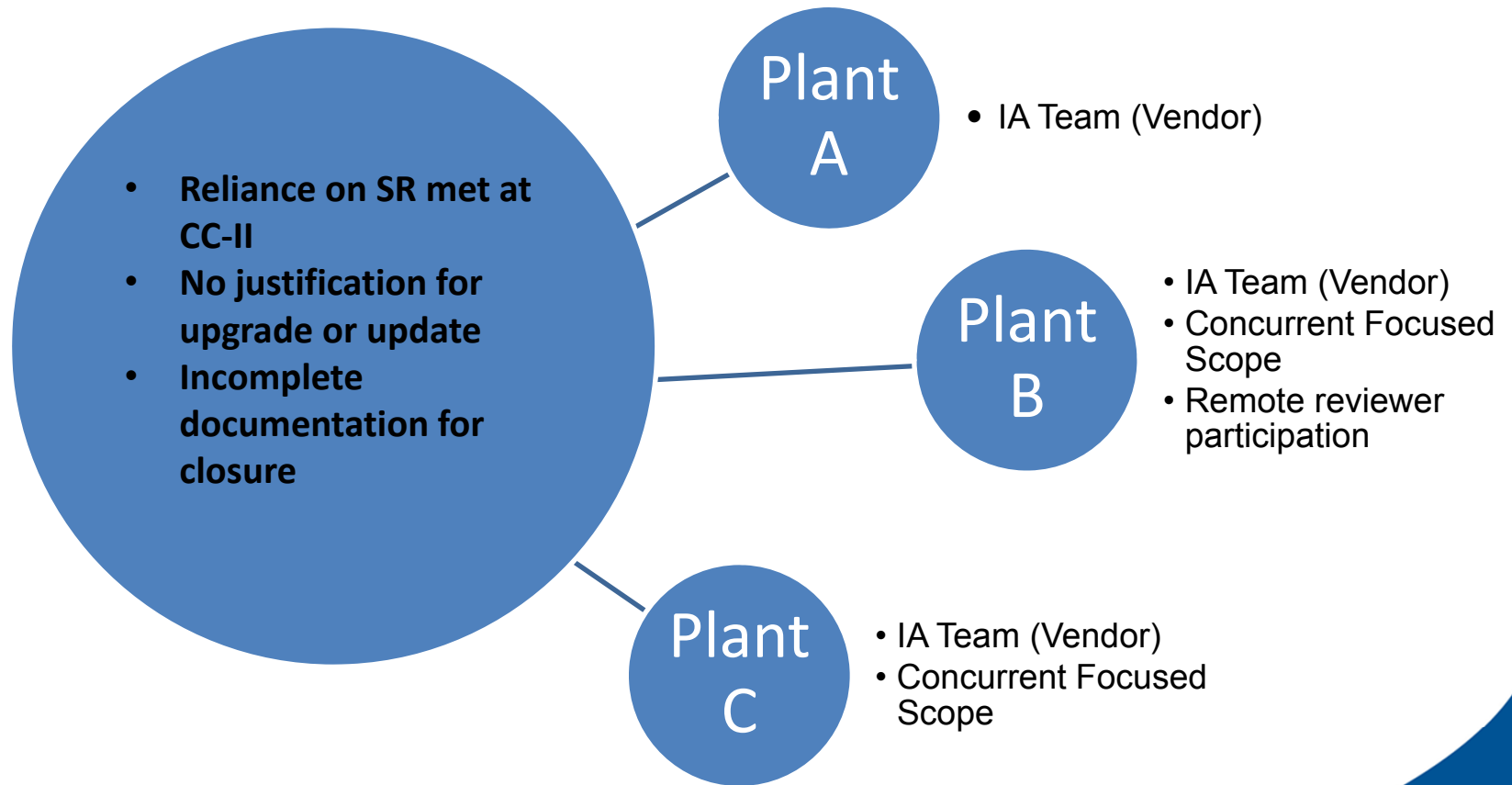


*Note: The final Appendix X process is documented in ADAMS Accession No. ML17095A252.*

## Industry Appendix X: IA Process Strengths

- Simplified process compared to the alternative process in the ASME/ANS PRA Standard for peer reviews
- IA Team has direct access to model of record (MOR) and supporting documentation.
- IA Team has access to Peer Review Report(s) including text of the original F&O.
- Process appears suitable for closure of F&Os addressing:
  - Documentation issues
  - Individual modelling and method errors
  - Incorrect F&O's
- When using both webinar and teleconference (shared screen, and voice connectivity) performing a limited scope IA remotely, appeared to be a suitable and capable manner to support IA reviewers role and responsibilities.
- The IA provides guidance for closure of the F&Os to be documented with a pedigree for retention during auditing and inspection purposes.

# Industry Pilots: NRC Staff Observations During Appendix X Development



*Note: The NRC staff observation report is documented in ADAMS Accessions No. ML17095A252.*



# Staff Acceptance of Appendix X

The NRC staff accepted the final version of the Appendix X guidance in a letter to NEI May 3, 2017 with the following conditions of acceptance (ADAMS Accession No. ML17079A427).

## **Conditions of Acceptance:**

- 1) Independent Assessment process does not include review of the closure of F&Os that include PRA upgrades: Focused scope peer review still required for PRA upgrades.
- 2) The licensee should adhere to the guidance in Appendix X in its entirety to obviate the need for an in-depth review and/or submittal of F&Os in licensing actions

# Post Acceptance: NRC Staff Observations

## 1. NEI 05-04, Appendix X, Section X.1.3: Use of Remote Reviewers

Participation of remote independent reviewers was not planned and scheduled.

## 2. NEI 05-04, Appendix X, Section X.1.3: Host Utility Preparation

- A written assessment and justification of explaining why each finding was either a PRA upgrade or maintenance update was not performed.
- Scope of F&Os included in the review and provided to the independent assessment team not clearly understood.

## 3. NEI 05-04, Appendix X, Section X.1.3: Close Out of F&Os by IA

- Unclear independence between review teams and work originators
- IA team did not review MOR with changes incorporated

Note: Note: The NRC staff observation report is documented in ADAMS Accessions No. ML17265A812.

# NRC Staff Audits: Crediting F&O Closure in Licensing Actions (RG 1.200, RG 1.174, SRP 19.1)

- Staff review of LARs and closure reports identified incomplete information for a streamlined review across regulatory guidelines (i.e., RG 1.200, RG 1.174, and SRP 19.1):
  - Scope of IA review (e.g., F&Os, self-assessment findings)
  - Concurrent focused scope performed
  - Timeline of peer reviews and IA performed
  - Written justification for if closure of F&O constituted an upgrade or maintenance update
  - IA team assessment of the closure of F&Os against the SR for Met at CC-II

# F&O Disposition in Licensing Applications

- IA F&O closure process has (so far) resulted in 60 – 80% reduction in number of open F&Os
- RG 1.200 guidance for open F&Os still applicable. LAR should include:
  - discussion of resolution of applicable F&Os
  - OR
  - Justification that demonstrates accident sequences or contributors significant to application decision not adversely impacted

## Endorsement of Appendix X in RG 1.200, Revision 3

- Endorsement of Closure of F&Os will further address:

1. Summary of information to be provided in the LAR when crediting Appendix X for closure of F&Os
2. Defined Terms for:
  - Model of Record
  - Base Model
3. Conditions of Acceptance

- Audits and Acceptance of F&O Closure process

- ☐ NRC staff will continue to perform audits and observations to provide continued monitoring and oversight of the Appendix X process.

- Appendix X Process should be standardized for reliance to:

- ☐ Foster efficiency in staff reviews.
- ☐ Improve adherence to guidance and staff endorsement of the Standard.
- ☐ Establish pedigree for training materials and qualifications.
- ☐ Promote consistency across guidance documents

# List of Acronyms

- Facts and Observations (F&Os)
- Independent Assessment (IA)
- Probabilistic Risk Analysis (PRA)
- American Society of Mechanical Engineers (ASME)
- American Nuclear Society (ANS)
- Regulatory Guide (RG)
- Nuclear Energy Institute (NEI)
- Internal Events (IE)
- Internal Flood (IF)
- Seismic Probabilistic Risk Analysis (SPRA)
- Model of Record (MOR)
- Fire Probabilistic Risk Analysis (FPRA)
- Capability Category (CC)
- Risk-informed Completion Time (RICT)
- Integrated Risk-Informed Leak Rate Testing (ILRT)