U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Regulatory Guide 1.200, Revision 3

Briefing for the
Advisory Committee on Reactor Safeguards
Full Committee

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Overview

- Purpose
- Background
- Changes incorporated into Revision 3
- ACRS Subcommittee members' feedback
- Primary regulatory driver for Revision 3
- Resolution of public comments on DG–1362
- Path forward

Purpose

To brief the ACRS Full Committee and solicit feedback on the staff's resolution of public comments on the staff's proposed revision 3 to Regulatory Guide (RG) 1.200 (i.e., DG-1362*)

* Available in the Agencywide Document Access and Management System (ADAMS) under accession No. ML19308B636

Background

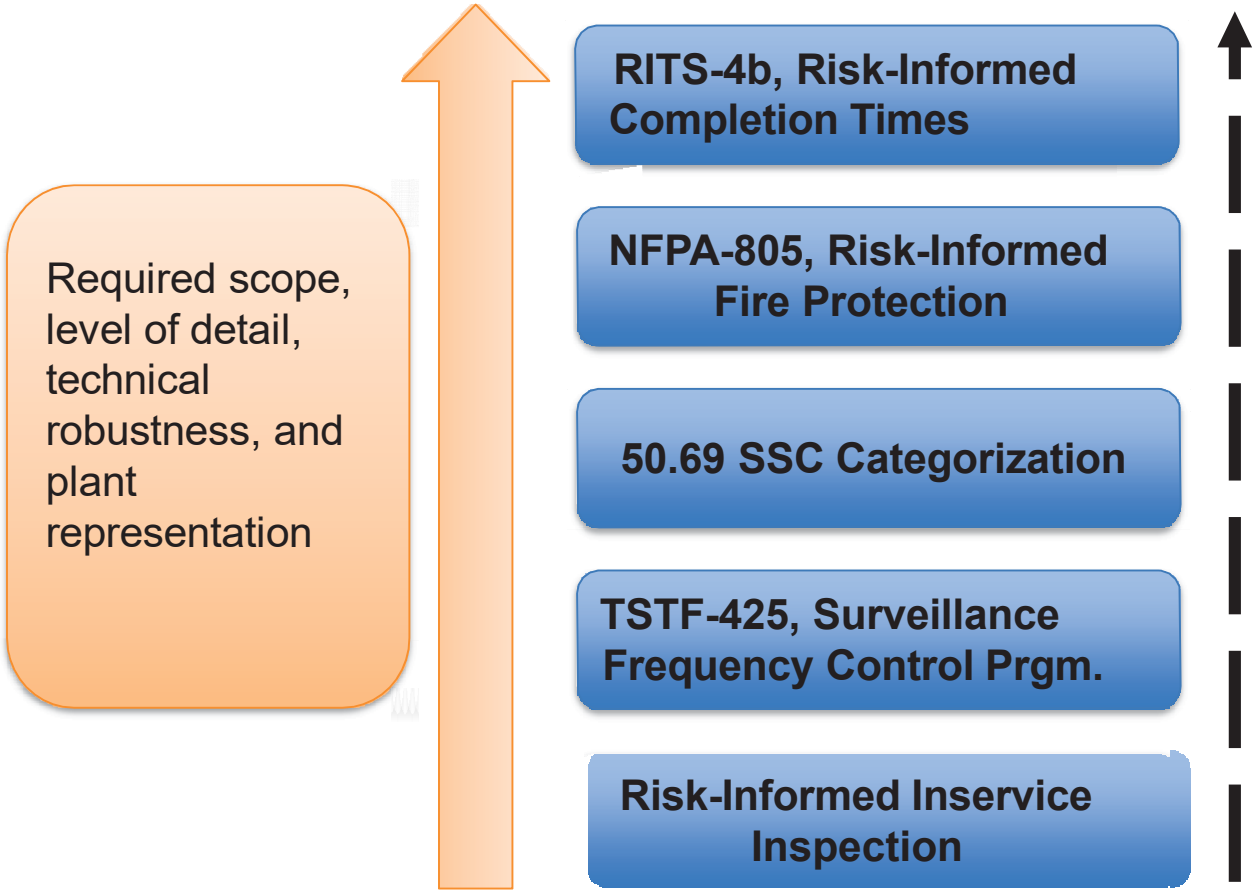
- RG 1.200 provides an approach for determining the technical acceptability of a base probabilistic risk assessment (PRA) model for use in regulatory decisionmaking for light-water reactors (LWRs)
- PRA acceptability is determined with respect to the following aspects of the base PRA:
  - Scope
  - Level of detail
  - Conformance to consensus PRA standard technical elements (i.e., technical robustness)
  - Plant representation

Background – PRA Acceptability

Each element depends on the other in order to demonstrate PRA acceptability

This paradigm obviates the need for an in-depth staff review of the base PRA model

Background – PRA Acceptability (cont')



- Greater reliance on PRA
- More flexibility for licensee
- More complex staff review

Changes incorporated into RG 1.200, Revision 3

- Endorses new industry documents:
  - NEI 17-07, Revision 2 (ML19241A615)
    - Consolidates predecessor industry PRA peer review guidance for different hazard groups
  - PWROG-19027-NP, Revision 2 (ML20213C660)
    - Includes requirements for determining acceptability of newly developed methods (NDMs) and necessary submittal documentation
    - Includes process for differentiating between PRA maintenance and a PRA upgrade
  - ASME/ANS RA-S Case 1 (i.e., the seismic code case)

Changes incorporated into RG 1.200, Revision 3 (cont')

- Provides a new glossary of terms
  - Some terms adopted directly from PWROG-19027-NP
- Provides descriptions of hazards to be considered in the development of a PRA

RG 1.200, Revision 3, retains the staff endorsement of ASME/ANS RA-Sa-2009 with an exception for terms and definitions endorsed from PWROG-19027-NP, Revision 2

ACRS Subcommittee Members' Feedback

- The staff briefed the ACRS Subcommittee on Reliability and PRA on February 5, 2020

- The staff did not identify changes based on views expressed by committee members

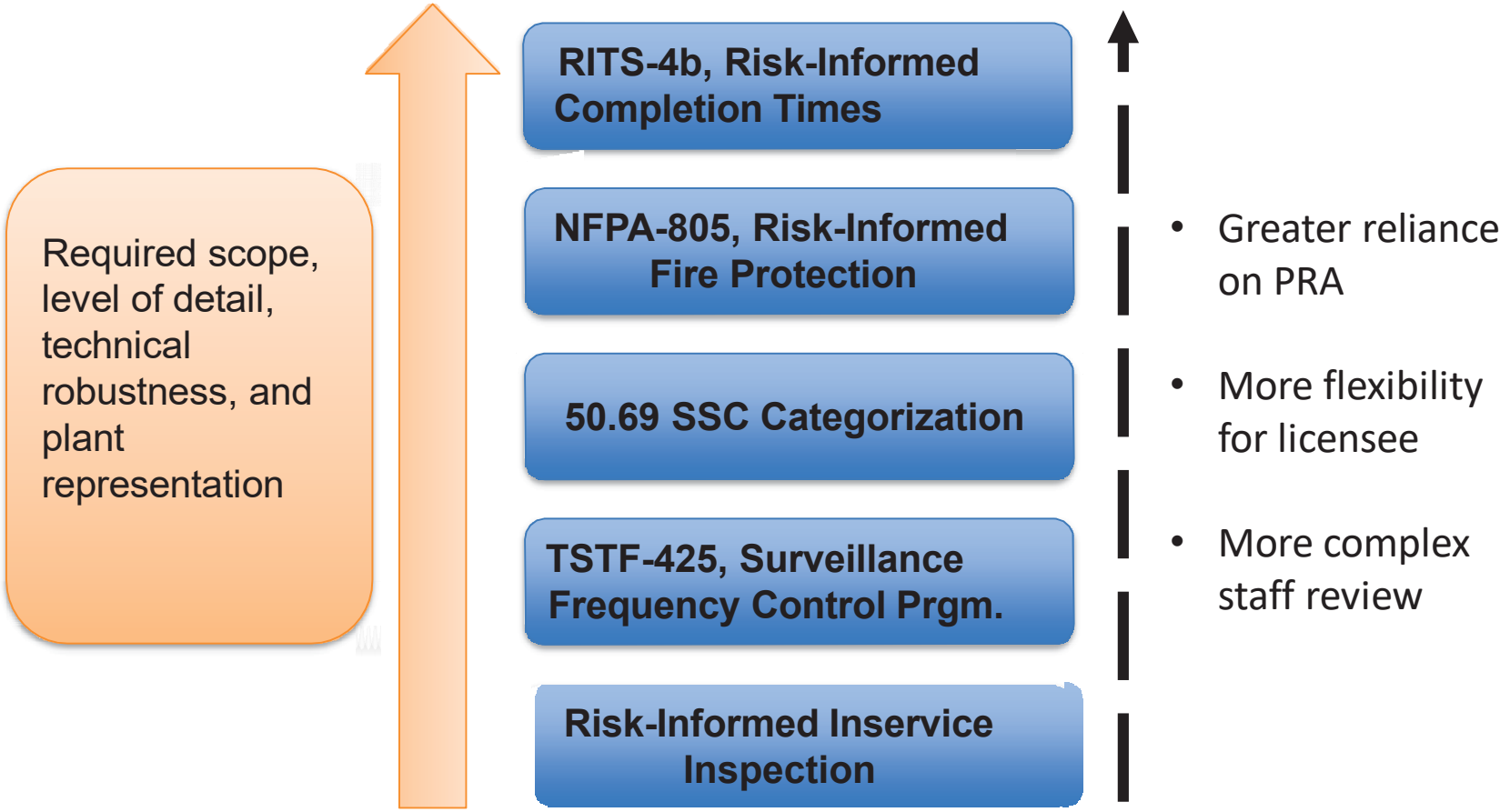
Primary Regulatory Driver for RG 1.200, Revision 3

- Evolution of the peer review process
  - "Gap" in Rev. 2 of RG 1.200 with respect to peer review of NDMs
  - Significance of closing this "gap," specifically for (Risk-Informed Technical Specification (RITS)-4b)
  - Strategy to close this "gap" using PWROG-19027-NP and NEI 17-07

A “Gap” in RG 1.200 and the ASME/ANS Level 1/LERF PRA Standard

- For each technical element, the ASME/ANS Level 1/LERF PRA standard provides high-level requirements (HLRs) and supporting requirements (SRs).
- 2009 version of the ASME/ANS Level 1/LERF PRA standard endorsed via Revision 2 to RG 1.200 does not provide HLRs or SRs for NDMs; Furthermore, there is no definition of what constitutes an NDM.
- This “gap” resulted in inefficiencies in the staff’s review of NFPA 805 applications and loss of confidence of the peer review method to adequately peer review NDMs.

Importance of Closing the "Gap"; Base PRA Acceptability for an Application



Current Solution to the "Gap"

- For RITS-4b applications, staff has imposed the following Administrative Technical Specification (TS)/License Condition:

  "...and any change in the PRA methods to assess risk that are outside these approval boundaries require prior NRC approval."

Leveraging the Commission Endorsed Peer Review Process to Close Gap

- SECY-99-256: "Rulemaking Plan for Risk-Informing Special Treatment Requirements," October 29, 1999
- COMNJD-03-0002, "Stabilizing the PRA Quality Expectations and Requirements," September 8, 2003
- SECY-04-0118, "Plan for the Implementation of the Commission's Phased Approach to Probabilistic Risk Assessment Quality," July 13, 2004
- SRM-SECY-04-0118, "Plan for the Implementation of the Commission's Phased Approach to Probabilistic Risk Assessment Quality," October 6, 2004.
- Establishment of the peer review process using RG 1.200 and consensus standards
- Peer review process acknowledged in regulations (10 CFR 50.69, November 2004)

Approach to Close the "Gap" in RG 1.200, Revision 3

- PWROG-19027-NP, Revision 2:
  - Provides definitions related to NDMs, PRA maintenance, and PRA upgrade.
  - Provides 6 HLRs and 21 SRs for peer review of NDMs (Are being considered for inclusion in the next edition of the ASME/ANS Level 1/LERF PRA Standard)

- NEI 17-07, Revision 2:
  - Delineates the process that peer reviewers must use to peer review NDMs in addition to other technical elements of the PRA.
- Emphasis has been added to *close* as opposed to *disposition* peer review finding relating to NDMs prior to using them in PRA models.

Public Comments on DG–1362: Summary

- DG-1362 issued for public comment on 07/01/2020
  - 30-day comment period ending 07/31/2020
- Received 19 public comments
  - Nuclear Energy Institute (NEI; 15 comments including text in transmittal letter)
  - Pressurized Water Reactor Owners Group (PWROG; 3 comments)
  - Individual (1 comment)
- Public comments included responses to two questions in *Federal Register* notice (FRN) on the closure of peer review findings using an NRC-endorsed approach
- PWROG submitted updated report PWROG-19027-NP, Revision 2, with its public comments

Changes to DG-1362 Based on Public Comments

Synopsis of Comment	Synopsis of Change to DG-1362
Peer review of PRAs that credit planned modifications	Added guidance for PRAs of operating plants that credit planned modifications – Considered as a special circumstance – Staff will address on case-by-case basis – Peer review and submittal documentation should clearly identify and describe such modifications and design changes

Changes to DG-1362 Based on Public Comments

Synopsis of Comment	Synopsis of Change to DG-1362
Correcting the definition of "PRA acceptability"	Added context to the definition of "PRA acceptability" – Determined for each risk-informed application – Considers staff positions in RG 1.200, in application-specific regulatory guidance, and any related requirements

Changes to DG-1362 Based on Public Comments

Synopsis of Comment	Synopsis of Change to DG-1362
Clarification of peer review of PRA upgrade(s)	Added guidance for peer review of PRA upgrade(s) – Performed prior to using the upgraded PRA model in support of a PRA application – Either for an approved risk-informed program or in the submittal of a risk-informed PRA application for NRC review – Use of a newly developed method (NDM) in a PRA is considered a PRA upgrade

Changes to DG-1362 Based on Public Comments

Synopsis of Comment	Synopsis of Change to DG-1362
Clarifying when differences between the 2005 and 2009 version of the Level 1/LERF PRA standard should be identified in support of a license amendment request	Clarified that differences between the 2005 and 2009 version of the Level 1/LERF PRA Standard need to be addressed only if 2005 version used to demonstrate base PRA acceptability

Changes to DG-1362 Based on Public Comments

Synopsis of Comment	Synopsis of Change to DG-1362
Ensuring consistency of Appendix D to RG 1.200, Revision 3, "Other Hazards," with Part 6 of the 2009 version of Level 1/LERF PRA Standard (ASME/ANS RA-Sa-2009)	Revised Appendix D, "Other Hazards" to be consistent with Part 6 of the 2009 version of Level 1/LERF PRA Standard (ASME/ANS RA-Sa-2009)

Changes to DG-1362 Based on Public Comments

Synopsis of Comment	Synopsis of Change to DG-1362
Removal of a clarification to NEI 17-07, Revision 2, on the documentation of the resolution of peer review findings	Public comment identified guidance in NEI 17-07, Revision 2, that addressed a clarification in the public release version of DG-1362
Submission of PWROG-19027-NP, Revision 2	Removal of clarification regarding PRA upgrade determination process because PWROG-19027-NP, Revision 2, addressed the clarification

Changes to DG-1362 Based on Public Comments

Synopsis of Comment	Synopsis of Change to DG-1362
Closure of peer review findings (answers to FRN questions)	Agreed that the F&O closure decisions should be based on cost and benefit for licensee F&O closure helps ensure PRA acceptability and reduces resources for licensee as well as staff Added guidance for disposition of peer review findings from any peer reviews – Findings should be evaluated for their impact on risk-informed application – Addressed with documented justification and necessary changes to the PRA – Prior to use of PRA in risk-informed application

Public Comments Resulting in No Changes to DG-1362

Synopsis of Comment	Synopsis of Change to DG-1362
Availability of RG 1.200, Revision 2 for use after issuance of Revision 3	– Comment was addressed via publicly available NRC staff response; It explicitly states that Revision 2 is not being withdrawn and, therefore, there is no need to modify DG. – This practice is consistent with other RG revisions – Staff, however, anticipates one revision of RG 1.200 to be followed for a given PRA application – Deviations from the referenced revision of RG 1.200 used in an application submitted to the NRC, including alternatives from other revisions of RG 1.200, should be identified and justified

Public Comments Resulting in No Changes to DG-1362

Synopsis of Comment	Synopsis of Change to DG-1362
Change use of the term “application” to narrower term "licensing application" throughout DG-1362	– The term “application” is used in RG 1.200 consistent with the definition of the term “PRA application” from ASME/ANS RA-Sa-2009, as endorsed by the NRC – Application-specific staff positions on PRA acceptability exists in corresponding guidance (e.g., Integrated Leak Rate Test)

Path Forward

- Staff considers ACRS Full Committee feedback
- Final reviews and concurrence
- Final publication late-2020/early-2021

Path Forward (cont')

- Revision 4 of RG 1.200 expected to include endorsement of the following LWR PRA standards:
  - Next edition of the ASME/ANS Level 1/LERF PRA standard; and
  - ASME/ANS Level 2 PRA standard
  - Advanced LWR PRA standard
- Advanced non-LWR PRA standard to be endorsed in a new RG

Path Forward (cont')

- Considerations for update of guidance on the treatment of uncertainty in PRA:
  - Update to reflect references to the next edition of the ASME/ANS Level 1/LERF LWR PRA standard
  - Consideration of application-specific guidance
  - Expansion of guidance on uncertainty in risk-informed decisionmaking
  - Uncertainty issues related to PRA for advanced reactor designs