

November 8,
2022 public
meeting

RG 1.247: ACCEPTABILITY OF PRA RESULTS FOR NLWR RISK INFORMED ACTIVITIES

BACKGROUND

- RG 1.247 endorses :
 - ASME/ANS RA-S-1.4-2021, “Probabilistic Risk Assessment Standard for Advanced Non Light Water Reactor Nuclear Power Plants”
 - NEI 20-09, “Performance of PRA Peer Reviews Using the ASME/ANS Advanced Non-LWR PRA Standard”
- Provides guidance on one acceptable approach the NRC staff has developed for determining whether a design-specific or plant-specific PRA used to support an application is sufficient to provide confidence in the results.
- ACRS Full Meetings- SC September 20, 2021; FC October 5, 2021.
 - ACRS concluded that RG 1.247 was acceptable for release on a trial basis.
- RG issued for trial use in March 2022
- Public comment period ended May 23, 2022
- FRN published October 17, 2022 (87 FR 62894)

COMMENT PERIOD

- Comments received from Nuclear Energy Institute (NEI) and X-energy
- Staff considers the comments on HLR-HR-E and HR-E₄ significant to the extent they warrant a response to clarify the record.
- No changes made to the TRG
- NRC staff will consider other comments in preparing a final draft of RG 1.247, and will consider the experience obtained through trial use of the RG.

COMMENTS ON ERRORS OF COMMISSION

- RG 1.247 takes exceptions to the ASME and ANS NLWR PRA standard regarding the treatment of errors of commission (EOCs) in a PRA.
- The exceptions provide for consideration of EOCs that result in adverse safety impacts for Capability Category I, (CC-I). CC-I defines the minimum capability needed for a PRA element. In contrast, Capability Category II (CC-II) defines the minimum capability needed to meet current good practice standards for each PRA element.
- The comments indicate that these exceptions are not consistent with the current PRA state of practice, and broadly considering EOCs goes above and beyond the requirement for the current operating fleet.

COMMENT ON ERRORS OF COMMISSION - STAFF RESPONSE

- The staff is keeping the exceptions related to EOCs in this trial use RG.
- Because there is limited operating experience regarding EOCs for NLWRs and the scope of the ASME/ANS NLWR PRA standard is broader than the scope of the ASME/ANS Level 1/LERF LWR PRA standard, EOCs may play a more important role in NLWR PRA than for LWR PRA and, therefore, NLWR PRA developers will need to address that EOCs are not an issue before eliminating them from consideration.
- The staff notes that such identification of EOCs is generally expected to apply to a PRA developed for the operational phase of a plant's lifecycle. Related staff guidance on the treatment of such EOCs during pre-operational phases of a plant's lifecycle is currently under development.
- Various studies, methods and references have been used to provide guidance on the use of EOCs (e.g., NUREG-2198, NUREG/CR 7017, ATHEANA, IDHEAS-ECA).

TRIAL USE COMMENTS

No.	Requirement	comment
1	HL-HR-E, HR-E ₄	The clarifications on HLR-HR-E and HR-E ₄ (EOCs) are not consistent with the current PRA State of practice and represents a new requirement above and beyond the requirement for the current operating fleet
2	POS-A8	Suggests POS review by operations personnel even for early pre-operational PRAs. Some PRA developers may not have operations personnel available at earlier phases in the design process.
3	HR-D ₄	The clarification may be appropriate for operating plants but not for plants in the early design phase where procedures may not be fully developed.

TRIAL USE COMMENTS

No.	Requirement	comment
4	WFR-I1	The clarification on WFR-I1 is redundant to item b) of WFR1. Documentation of the dominant failure mode covers f, the method of analyses covers g and the sources of information covers h.
5	General sections	Guidance on PRA acceptability for construction permit applicants would be appreciated.
6		The analysis elements in the RG do not align with the high level requirements in the standard. The RG separates the standard sub-element for Protective Action Parameters and Other Site Data Analysis into site characterization and protective action analysis. The 50 mile site characterization will not be required for all risk-informed applications.

TRIAL USE COMMENTS

No.	Requirement	comment
7	Sect.2.2	The definition of feasible provided here may be appropriate for the HRA requirements within the standard, HLR-DA-D also uses the word feasible in a manner not consistent with the proposed definition
8	IE-C9	Editorial- missing parenthesis
9	HR-G1	Added expectations of feasibility studies
10	HR-E4	Errors of commission- inconsistency with current state of the practice
11		Addressing NRC's non-endorsement of supporting requirements addressing reporting thresholds

NEXT STEPS

- RG Trial Use period
 - Approximately two years
 - Allow time to incorporate any changes related to revision of the NLWR Standard
 - Incorporate changes/comments that arise from trial use
 - Potential PRA peer review observations