Program Management Office
1000 Westinghouse Drive
Cranberry Township, Pennsylvania 16066

Project 694
Docket 99902037

July 15, 2022

OG-22-132

U.S. Nuclear Regulatory Commission
Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Subject: PWR Owners Group, Risk Management Committee
PWROG Comments on "U.S. NRC Level 3 Probabilistic Risk Assessment (PRA) Project, Volume 3x: Overview of Reactor, At-Power, Level 1, 2, and 3 PRAs for Internal Events and Internal Floods" (ADAMS Accession No. ML22067A210)

The PWR Owners Group has consolidated, on behalf of its members, the attached comments on "U.S. NRC Level 3 Probabilistic Risk Assessment (PRA) Project, Volume 3x: Overview of Reactor, At-Power, Level 1, 2, and 3 PRAs for Internal Events and Internal Floods" (ADAMS Accession No. ML22067A210). The PWROG appreciates the opportunity to provide comments on the draft from NRC research.

The attached comments detailed in Appendix 1 are suggestions for the staff's consideration as the final report is prepared.

If you have any questions, please do not hesitate to contact me at (602) 999-2080 or Mr. Dewey Olinski PE, Executive Director of the PWR Owners Group, Program Management Office at (412) 374-3025.

Sincerely yours,

Michael Powell
Chairman and COO
PWR Owners Group

Appendix 1: PWROG Comments on the US. NRC Level 3 Probabilistic Risk Assessment (PRA) Project, Volume 3x: Overview of Reactor, At-Power, Level 1, 2, and 3 PRAs for Internal Events and Internal Floods (Non-Proprietary)

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cc: PWROG PMO
PWROG Risk Management Committee
PWROG Licensing Committee
B. Dolan, PWROG
M. Powell, PWROG
D. Mirizio, PWROG
C. Holderbaum, PWROG
D. Olinski, PWROG
L. Fields, US NRC
A. Kuritzky, NRC

Appendix 1 – PWROG Comments on the US. NRC Level 3 Probabilistic Risk Assessment (PRA) Project, Volume 3x: Overview of Reactor, At-Power, Level 1, 2, and 3 PRAs for Internal Events and Internal Floods

#	Comment	Affected Section	Suggested Change/Enhancement
1	The release category frequencies (2012 and 2020 cases) for sequence 1-REL-LCF seem high compared to our understanding. The highest frequency contributor to 1-REL-LCF is defined as: "A grid-related LOOP occurs. Various equipment failures contribute to a loss of onsite emergency AC power. Actions to implement FLEX strategies or extend the TDAFW pump operation fail resulting in core damage. Without containment heat removal systems available, gradual pressure increase results in containment overpressure failure. " In order to experience this sequence there must be a grid LOOP. Grid LOOP frequency estimates range from around 1E-3 to around 1E-2/yr (NUREG/CR-6928 for example suggests mean or median values around 1E-2/yr). The failure of both trains of EDGs can be estimated. Typical value may be around 1E-3, for start and run failure (independent and CCF). See plant or SPAR models to evaluate the appropriateness of this estimate. Failure of onsite FLEX strategies can be bounded, assume 1E-1.	Table 3.2-2	Provide discussion of reasons for differences between "back of envelope" estimate in comment and calculated values for 1-REL-LCF. If appropriate, update report to remove excess conservatisms.

	Therefore likelihood of core damage due to (highest frequency contributor to the release category) Grid LOOP, failure of all onsite AC power, and failure to align FLEX equipment would be on the order of 1E-2 * 1E-3 *1E-1 = 1E-6. Consider that even if core damage occurs, recovery of offsite power prior to containment failure would allow prevention of that failure and subsequent releases. Table 3.2-5 of the subject report indicates that approximately 48 hours are required before containment is expected to fail. Likelihood of failure to recover offsite power due to grid LOOP within 24 hours is perhaps 0.01. (NUREG/CR-6980 indicates likelihood is very small, probably less than 0.01). If offsite power were recovered within the first 24 hours, that would leave a margin of an additional 24 hours prior to containment failure. Restoration of containment cooling in that time would prevent containment failure and release. Therefore the likelihood of the highest frequency contributor to 1-REL-LCF release would appear to be bounded below 1E-6 * 1E-2 = 1E-8. Even considering many similar sequences binned into a single release category, the subject report appears to say that the likelihood is several orders of magnitude more likely.		
2	Section 4.1.1 of ML22067A210 describes the failure probabilities used for FLEX and manual TDAFW pump operations and notes that they were chosen by	Section 4.1.1 of ML22067A210	As part of a future effort, consider incorporating FLEX failure probabilities developed in PWROG-18042-NP [accession number ML22123A259].

	expert judgment. The conclusion that the choice of these values does not have a large impact seems reasonable and is based on a sensitivity study. However, a future effort/update could incorporate the FLEX failure probabilities developed in PWROG-18042.		
3	Even though these margins can vary for other plants due to variations in their design and siting, the estimates derived for the reference plant, when adjusted for siting and design variations, would provide useful qualitative risk insights for other U.S. operating plants. Does this mean the NRC has come up with a process to adjust the L3 PRA results for the reference plant to reflect other sites to obtain qualitative risk insights? Or is the intent of this sentence to say it would, in theory, be possible to do so?	Abstract - ML22067A210	Please expand on whether the NRC has come up with a process to adjust the L3 PRA results for the reference plant to reflect other sites to obtain qualitative risk insights, or if the intent of this sentence to say it would, in theory, be possible to do so.
4	Reducing modeling time to approximately 2 days after accident initiation reduces late containment failure to less than 20 percent of CDF. Should this sentence say “to less than 20 percent of LERF”?	Section 2 of ML22067A210	Please clarify the indicated sentence.
5	Early fatality risk was shown to be almost negligible, and latent fatality risk was shown to be “well below the QHO associated with the safety goals.” Is it reasonable to think that, assuming other (simplified?) L3 PRAs showed similar results for other plants, such assessments would provide [at least partial] justification for relaxation of CDF/LERF risk targets (e.g., the 1.0E-04/yr target in RG 1.174)?	ML22067A210 (General comment)	Consider including a discussion on the impact of risk thresholds in other regulatory documents.

6	One of the largest contributors to LCF risk is long-term reoccupation of contaminated land. This may have been discussed in other volumes, but were assumptions regarding reoccupation static, or do they change with time? For example, is the decision to allow the population to return based on current population and land-use data, or does it reflect expected changes to population and land-use within the time between the accident and the end of the intermediate phase?	ML22067A210	List assumptions used to determine reoccupation of contaminated land.