From:	Carolyn Lauron
To:	Justin Hawkins
Cc:	Greg Cranston; Andrew Brenner; Jordan Glisan; Michael Dudek
Subject:	NRC Staff Response to Follow-up Questions regarding the Scope of PRA and Turbine Missiles (RG 1.115)
Date:	Wednesday, January 4, 2023 3:26:00 PM

Hi Justin –

Below is the NRC staff response to the follow-up questions regarding the scope of the PRA and Turbine Missiles (RG 1.115).
If you have questions or need more information, please let us know.

Thanks,
Carolyn Lauron
US NRC

Previous Question/Answer:

Q: If the orientation of the turbine is unfavorable for essential SSCs and the applicant does the analysis in RG 1.115 to ensure the probability of failure is below RG 1.115 and associated SRP 3.5.1.3 criteria (1x10-7 per year), can the applicant screen out the turbine generated missile hazard from the plant design PRA?

Note that RG 1.115 considers plants designed with no essential SSCs within the low-trajectory hazard zone to have a favorable turbine orientation. Unfavorable turbine orientation has essential SSCs within the low-trajectory hazard zone. RG 1.115, Section C, Position 5 states that, "The NRC will review turbine designs that are significantly different from the current 1,800-rpm machines on a case-by-case basis to determine the applicability of the strike zones."

A: An advanced LWR applicant has the option of screening out a hazard, such as turbine generated missiles, from its PRA **or** include the hazard in the PRA and demonstrate its impact on risk insights and PRA results. The NRC staff expects detailed technical justification supporting the selected option, especially if the orientation of the turbine is unfavorable for essential SSCs. The applicant should include key assumptions from the analysis in Chapter 19 of the FSAR, as necessary. The applicant should note that Regulatory Guide (RG) 1.200, Revisions 2 and 3, states that "it is recognized that for those new reactor designs with substantially lower risk profiles (e.g., internal events [core damage frequency] CDF below 1x10-6 per year), the quantitative screening value should be adjusted according to the relative baseline risk value.

Follow-up Question(s):

Q's: We are confused about purpose of the RG 1.115 and, **IF and/or HOW** the RG unfavorable orientation probability screening applies to the PRA. For a new passive LWR design, with a much smaller potential CDF when compared to the existing fleet of LWRs (E-7 vs E-5), it seems like the PRA screening threshold becomes **so low** (**our understanding is *2 orders of magnitude lower than the current fleet 1E-6/yr screening threshold, down to 1E-8/yr, for an ALWR design***) that it is almost

impossible to screen out a potential turbine missile IE from the PRA.

1. Is our understanding of the above, correct?

2. Can the staff provide clarity and/or insights into the highlighted sentence from the initial ANSWER above?

NRC Staff response:

1. Based on the NRC staff review of PRAs submitted with 10 CFR Part 52 applications, applicants have not used a quantitative screening criterion. Instead, consistent with the Commission's 1985 Severe Accident Policy Statement for new reactors and the requirement for 10 CFR Part 52 applicants to report the results and insights of a design specific PRA, applicants report risk significant sequences and/or risk significant cutsets. Consistent with RG 1.200 Revision 3, a significant accident sequence or cutset, when ranked by risk contribution from highest to lowest, compose 95 percent of the CDF or the LERF/LRF for a given hazard or plant operating state, or that individually contribute more than 1 percent to the CDF or LERF/LRF for a given hazard or plant operating state.

2. The highlighted sentence in the initial answer was included for the applicant's awareness in the context of the original question on screening hazards from a PRA.