

NRR-DRMAPEm Resource

From: Mahoney, Michael
Sent: Saturday, June 1, 2019 10:25 AM
To: Art Zaremba
Subject: McGuire ESPS Status and Catawba ESPS Clarifications

Art,

The McGuire SE is still under review by OGC, no show stoppers, just a long/complex SE that is taking time. Early next week I hope to be complete. As for Catawba, we have talking about the non-PRA related questions we have, here are the PRA-related clarifications.

Question 01.a.01 – Safe Shutdown Facility (SSF) Credit for High Winds

The cutset results in Table 7-31, “Top 25 Delta Cutsets – CNS High Winds CDF,” of LAR Attachment 7, dated May 2, 2017, show the Standby Shutdown Facility (SSF) is credited in F3 high wind events [i.e., cutsets # 7, 8, 9, 13, and 25 contain either basic events HW31SSF (all high winds failure of SSF for high wind interval F3-1) or HW32SSF (all high winds failure of SSF for high wind interval F3-2)]. However, the response to RAI 01.a, dated March 7, 2019, states, “[t]he credit for the SSF is extended to F1 and F2 straight-line wind and tornado high wind-initiated events only ... [n]o credit is taken for the SSF in straight[-]line wind or tornado events higher than F2.” The response to RAI 13.c, dated March 7, 2019, indicates changes were made to the high winds probabilistic risk assessment (PRA) to credit SSF in F2 straight-line and tornado high wind events, but this response does not indicate removal of SSF credit in F3 and higher wind events. Therefore, there appears to be an inconsistency between the LAR and the response to RAIs 01 and 13.

Explain how SSF is credited for F3 high wind events in the high winds PRA used to calculate the results provided in response to RAI 13. As appropriate, provide revised responses for RAI 01 and 13 for the above explanation, including a description and justification of any changes to the Catawba high winds PRA in support of the aggregate analysis (i.e., RAI 13.c).

Question 10.b.01 – Sources of Model Uncertainty and Parametric Uncertainty

The response to RAI 10.b, dated March 7, 2019, states for the parametric uncertainty analysis, Since the SOKC [state-of-knowledge correlation] impacts are evaluated by the UNCERT code, the corrections applied to adjust the CAFTA point estimate are removed before running the [UNCERT] code. This results in the point estimate listed for the UNCERT run being reduced from the CAFTA produced point estimate. The nature of these CAFTA corrections is unclear, including why these corrections are made and why they are appropriate.

Specifically explain what is meant by “the corrections applied to adjust the CAFTA point estimate are removed before running the code” in response to RAI 10.b, dated March 7, 2019. Include in this discussion: (1) the correction values applied; (2) the purpose of these corrections in adjusting the CAFTA point estimate risk values; (3) why are these corrections removed before running the code; and (4) how they affect the final risk values provided in the LAR, as supplemented, and provide a technical justification why it is appropriate if they have more than a minimal impact.

Question 13.01 - Aggregate Update Analysis

The response to RAI 13, dated March 7, 2019, provided the risk results for the mean aggregate (sensitivity) case and best estimate case based on the most limiting plant and alignment configuration along with descriptions of PRA model updates. The following observations are noted regarding the response to RAI 13:

- The results between the mean aggregate (sensitivity) case and the best estimate case are nearly identical. However, it is not clear what the difference is between these two cases, because the response did not define or describe the differences between the mean aggregate (sensitivity) and the best estimate cases.
- The response to RAI 13.d states the aggregate risk estimates (based on the combined contribution from internal events, internal flooding, high winds, and fire) for both cases meet the risk acceptance guidelines of Regulatory Guide (RG) RG 1.177 and RG 1.174, and therefore, the licensee did not address RAI 13.e for exceeding the guidelines. However, these risk estimates excluded the seismic

contribution, which is required by RG 1.177. Including the seismic contribution, the aggregate risk estimates exceed the risk acceptance guidelines for incremental conditional core damage probability (ICCDP) and incremental conditional large early release probability (ICLERP) by about 16% and 3%, respectively. As a result, the licensee should address RAI 13.e regarding exceedance of the risk acceptance guidelines. Though the response did identify a few conservatisms in the risk analysis (e.g., FLEX is not credited in the PRA, and the high winds PRA does not credit recovery of offsite power), the response did not provide any quantifiable measures of their impact on risk. Issues associated with crediting FLEX in the PRA are discussed in NRC memorandum, "Assessment of the Nuclear Energy Institute 16-06, Crediting Mitigating Strategies in Risk-Informed Decision Making, Guidance for Risk-Informed Changes to Plants Licensing Basis," dated May 30, 2017 (ADAMS Accession No. ML17031A269).

- The response to RAI 13.c states the operator action for aligning the Emergency Supplemental Power Source (ESPS) was refined based on developed procedures and subsequently developed a dependency analysis for human failure event (HFE) combinations. The nature of these refinements is unclear (e.g., was the level of detail increased to produce more realistic results, were model uncertainties that have been introduced by assumptions removed via the development of more sophisticated models). Based on the risk assessment results presented in LAR Attachment 7 for Catawba, operator failure associated with implementing ESPS is a significant contributor to the change in risk results for this LAR. This demonstrates the importance of calculating a realistic human error probability (HEP) for this operator action. Therefore, the NRC staff has a general need to confirm the reasonableness of the updated HEP for the ESPS operator action.

To address the observations above, the NRC staff requests the following additional information.

- a) Describe the mean aggregate (sensitivity) case and how it differs from the best estimate case in the response to RAI 13.a.
- b) With regards to exceedance of the RG 1.177 risk acceptance guidelines, provide justification that the risk results in the aggregate analysis in response to RAI 13.a (i.e., aggregated ICCDP and ICLERP based on the combined contribution from internal events, internal flooding, high winds, fire, and seismic) are acceptable for this application. This justification should be of sufficient detail and may include the following: (1) provide the results of a more detailed, realistic analysis to reduce conservatism and uncertainty and describe this analysis in detail; (2) propose compensatory measures and their associated quantifiable/quantitative impact on the risk results; and (3) discuss the conservatisms in the analysis and their quantifiable/quantitative impact on the risk results.
- c) With regards to the response to RAI 13.c, describe and justify the refinements made to the ESPS operator actions, including the associated human reliability analysis and dependency analysis. Provide sufficient details to justify the basis for the revised HEP values and dependency analysis combination values, including how the time available and time required to complete operator action was estimated, walk-throughs, operator interviews, and joint human event probability (JHEP) floor values. As necessary, provide updated discussions of the ESPS operator action in those parts of the LAR and LAR supplement dated October 8, 2018 (e.g., response to RAIs 06 and 07) that are no longer current or valid.

Additionally, the NRC staff believe that Regulatory Commitment number 1 (related to severe weather) should be escalated to a license condition. This is requested to address uncertainties associated with the high winds PRA (which were identified in the March 7, 2019 response) and the fact that high winds dominate the risk profile.

Thanks
Mike

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