

REQUEST FOR ADDITIONAL INFORMATION 640-5051 REVISION 2

9/27/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 19 - Probabilistic Risk Assessment and Severe Accident Evaluation
Application Section: 19.1.5.3

QUESTIONS for PRA and Severe Accidents Branch (SPRA)

19-466

It appears that the calculated US APWR internal flooding CDF is higher than the total internal events CDF, contributing approximately 33% to the plant total at-power CDF. Thus, please describe, to the extent practicable, why US APWR internal flooding is a significant contributor to plant risk. Did MHI consider design changes or other actions to minimize the risk due to internal flooding? If so, what did MHI consider?

19-467

In accordance with guidance provided in SRP Appendix A, Section 19.1.3.4, please explicitly describe in the US-APWR DCD the uses of the US-APWR internal flooding PRA in the design process to reduce or eliminate the weaknesses/vulnerabilities in current reactor designs, indicating the effect of new design features and operational strategies on plant risk, and identifying and using the PRA-based insights and assumptions to develop design requirements to improve the US-APWR design safety profile.

19-468

In the US-APWR DCD Section 19.1.5.3.1 (for example), which discusses the internal flooding PRA models, the floor drain system is credited to drain fluid and minimize the impact of flooding. Is the potential drain system blockage considered in the PRA model? If yes, please describe, otherwise, justify the exclusion.

19-469

The internal flooding insights provided in Table 19.1-119 of US-APWR DCD are limited to the design insights but not risk insights. The phrase "risk insights" refers to the results and findings that come from the internal flooding PRA. Thus, please update and enhance this table to include the internal flooding risk insights such as:

- Which rooms are more significant to internal flood risk and why
- Which systems are more significant to internal flood risk and why
- Which systems are more significant to internal flood frequency and why
- Flood isolation/mitigation insights

REQUEST FOR ADDITIONAL INFORMATION 640-5051 REVISION 2

- Propagation insight
- Operator action insights
- Major contributors to the uncertainty associated with the risk estimates
- Etc.

19-470

Please revise the DCD to include a combined license (COL) action item or similar commitment that ensures the COL applicant that references the US-APWR design certification will perform as-designed and as-built information verification and will conduct walk-downs to confirm that the assumptions used in the PRA remain valid with respect to the internal flooding events.

19-471

Please explain why the number of internal flood PRA components shown in Table 22.3-2 of the US-APWR PRA is much greater than the fire PRA components provided in the Appendix 23F given that the flooding and fire zones include the same areas.

19-472

The staff identifies multiple inconsistencies between the updated internal events US-APWR PRA submitted in the current DCD Revision 2 and the internal flooding PRA (i.e., flood-induced LOFF CCDP in US APWR PRA Table 22.6-2 is less than the internal events LOFF CCDP in US APWR DCD Table 19.1-23). It appears that the internal flooding PRA currently presented in the US-APWR DCD Revision 2 is quantified using the internal events PRA provided in the DCD Revision 1. Please describe the plan for updating the internal flooding PRA to be consistent with the most recent internal events PRA.