REQUEST FOR ADDITIONAL INFORMATION 302-2327 REVISION 1

4/2/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 15.01.05 - Steam System Piping Failures Inside and Outside of Containment (PWR)
Application Section: 15.1.5

QUESTIONS for Reactor System, Nuclear Performance and Code Review (SRSB)

15.01.05-1

Question 15.1.5-1

In DCD Section 15.1.5, the applicant presents the results of a set of Steam System Piping Failure events. Case B considers a double-ended break without offsite power; however, Table 15.1.5-1 indicates that the onset of RCP coast down is delayed until 4.5 seconds after the break. This appears to be the timing of the ECCS actuation as RCP trip coincides with ECCS actuation. What is the effect of this timing delay for LOOP on the analysis of this event? What is the basis for this assumed timing of LOOP (three seconds after reactor trip at 1.5 seconds)?

15.01.05-2

Question 15.1.5-2

The supporting methodology for steam system piping failures (DCD Section 15.1.5) states that MARVEL-M is used with point kinetics and that the code produces conservative results relative to space-dependent kinetics because of the reactivity weighting functions used. Provide proof that the point kinetics model will provide conservative results relative to using TWINKLE-M or equivalent.

15.01.05-3

Question 15.1.5-3

In DCD Section 15.1.5, the applicant presents results for three cases that were analyzed for Steam System Piping Failures. Cases A and B consider a double-ended break from hot standby with and without offsite power, respectively. The applicant indicated on Pg. 15.1-87 “the minimum DNBR in Case B is less limiting than the minimum DNBR in Case A,” although the time of minimum DNBR is not presented. Since in both Case A and Case B the reactor is tripped on the same low main steam line pressure signal, it was expected that the minimum DNBR would be the same in both cases. Is this difference because the transient is from hot standby rather than from power? Please provide the reason(s) for this difference.

15.01.05-4

Question 15.1.5-4

Provide plots of DNBR verses time for Cases A and B in DCD Section 15.1.5.

15.01.05-5

Question 15.1.5-5

Section 15.1.5 indicates that the results of MSLB analyses show that DNB does not occur in all cases analyzed. However, for Case A and B, the transient DNBR data are not provided. Provide the DNBR curves to backup these results.