

REQUEST FOR ADDITIONAL INFORMATION 769-5797 REVISION 3

6/14/2011

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 15 - Introduction - Transient and Accident Analyses
Application Section: 15.0

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

15-25

MUAP-07010, "Non-LOCA Methodology" includes sample transient analysis of six events to demonstrate event specific methodology. These same events are also analyzed in the DCD, but for each transient, the times in the "Sequence of Events" tables differs between MUAP-07010 (Sections 6.1 – 6.6) and the DCD (Sections 15.4.2, 15.3.1, 15.4.8, 15.1.5, 15.2.8, and 15.6.3). In order to determine if the event specific findings made on MUAP-07010 are applicable to the DCD analysis, explain the differences between the two analyses for each event.

15-26

Table 15.0-5 identifies the time delays for mitigation systems. Provide the source for each of these values. Are these time delays measured from when the instrumentation reaches the actuation limit (i.e. time delays in Table 15.0-5 already include the signal time delay identified in Table 15.0-4) or are they measured from when the mitigation system receives the signal (i.e. signal time delays from Table 15.0-4 should be added to the mitigation system delays from Table 15.0-5)?

15-27

DCD 15.0.0.2.2 states that the steady-state errors of $\pm 4^{\circ}\text{F}$ for average RCS temperature and ± 30 psi for pressurizer pressure are conservative. In accordance with SRP 15.0 I.6.C.ii, please provide the bases for these values so the staff can assess the degree of conservatism.

15-28

DCD 15.0.0.2.2 states that steady state errors are added to the nominal plant parameters to determine the initial conditions for departure from nucleate boiling (DNB) limited events not analyzed using the revised thermal design procedures (RTDP). The analyses described in 15.1.4, Inadvertent Opening of a Steam Generator Relief or Safety Valve, and 15.1.5, Steam System Piping Failure Inside or Outside Containment, are DNB limited events that do not use the RTDP, so it is expected the initial conditions would be based on nominal values plus measurement uncertainties. However, Table

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15.0.0-10.1 (included in the response to RAI 15.0.0-10) indicates that nominal values are used for RCS pressure and temperature. Please explain this apparent inconsistency.

15-29

Per Table 15.0.0-10.1 (included in the response to RAI 15.0.0-10), the increase in heat removal transients analyzed in Sections 15.1.1 through 15.1.5 assume 10% of the steam generator tubes are plugged. This appears to be non-conservative because it reduces the heat transfer from the primary to secondary system, lessening the severity of these cool-down events. Please justify this assumption.