

REQUEST FOR ADDITIONAL INFORMATION 687-5394 REVISION 2

1/27/2011

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 15 - Introduction - Transient and Accident Analyses

Application Section: 15.0.0.7 and 8.2.3

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

15-24

Question No. 15.0.0-24

The NRC staff notes that there is an inconsistency between Chapter 8 and Chapter 15 with respect to the basis for the 3 second time delay between a reactor trip and the loss of offsite power (LOOP). Per DCD Section 15.0.0.7, the safety analyses assume that a LOOP occurs a minimum of 3 seconds after a reactor/turbine trip to account for the time it would take for grid instability, caused by the turbine-generator trip, to propagate through the grid to the plant offsite power source. However, Section 8.2.3 states that in the event of a LOOP concurrent with reactor/turbine trip, the main generator remains connected to the grid powering reactor coolant pumps (RCPs) thru the UATs and that the large inertia of the turbine-generator will maintain voltage and frequency for more than 3 seconds.

Remove the apparent inconsistency between Chapter 8 and chapter 15 and provide the following:

- a) If the statement in Section 8.2.3 provides the relied-upon basis, describe in detail how the large inertia of the turbine generator would maintain adequate voltage and frequency to the RCPs for an additional 3 seconds, assuming that a LOOP occurs concurrently with a reactor/turbine trip. The staff is concerned that during this event the main generator would attempt to power the grid and may not be able to support adequate voltage and frequency for the RCPs for 3 seconds to satisfy the Chapter 15 safety analysis assumptions. Therefore, the applicant needs to show that adequate voltage and frequency will be maintained during this scenario before the generator is separated from the grid.
- b) If the statement in Section 15.0.0.7 of the DCD provides the relied-upon basis, provide an analysis that demonstrates that a LOOP occurs a minimum of 3 seconds after a reactor/turbine trip to support this assumption. As part of this analysis, provide the basis for the conclusion that this is a bounding situation given the site-specific nature of such analysis.