

REQUEST FOR ADDITIONAL INFORMATION 875-6211 REVISION 3

12/5/2011

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 08.04 - Station Blackout

Application Section: 08.04

QUESTIONS for Electrical Engineering Branch (EEB)

08.04-15

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10 CFR 50.63, "Loss of all alternating current power," requires that the design must be able to withstand for a specified duration and recover from a station blackout. Indicated in responses to RAIs 3170 (Question 10.04.09-24) and 1848 (Question 10.04.09-8) the evaluation that addresses the scenario identified in NUREG-0635 and 0611 in which a loss in EFW pump room cooling occurs would not fail the EFW turbine-driven pumps during the first hour because room heatup calculations show the room temperatures would not exceed the equipment qualification limits during the first hour. Since the EFW pump rooms contain equipment used to respond to Station Blackout, and there is substantial heat generation in the rooms, and no operational heat removal systems during the first hour of the SBO, reasonable assurance of EFW room equipment operability should be provided.

- a. Provide the heatup calculations for the EFW pump rooms for a station blackout induced loss of ventilation event in which the turbine-driven EFW pumps begin to operate at the onset of the station blackout and the EFW pump room cooling is not available during the first hour after the onset of SBO. Information provided should include the transient ambient air temperature of the room over the SBO coping period (8 hours), initial environmental conditions assumed, time dependent heat loads, details of room geometry, humidity assumptions, thermal stratification, thermo-physical properties of materials, major assumptions and boundary conditions used in the analysis, and the identification of any operator actions necessary, and assumptions regarding equipment which may be out of service due to routine maintenance or LCO conditions.
- b. Provide documentation in the FSAR to support the determination that in the event of a Station Blackout, that reasonable assurance of EFW room equipment operability is provided for both mechanical and electrical equipment. (include documentation of the turbine control system environmental qualification that justify why TDEFW pumps will continue to operate stably at least one hour after loss of all room cooling).
- c. Provide in the FSAR the EQ room temperature envelope for the EFW (T/D) pump room, showing both the calculated transient room temperature, and the EQ envelope temperature.

Provide sensitivity studies of the heatup calculations for the EFW pump rooms including an analysis extending to the first two hours after onset of SBO, with no ventilation, and identify the time that ambient room temperature reach the EQ maximum temperature for the EFW pump rooms.