

REQUEST FOR ADDITIONAL INFORMATION 468-3360 REVISION 1

10/6/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 09.05.04 - Emergency Diesel Engine Fuel Oil Storage and Transfer System
Application Section: Tier 2 Section 9.5.4

QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)

09.05.04-44

Supplemental to Question No. 09.05.04-10 (RAI 9.5.4-05; RAI Set No. SBPB 318-2227, Rev. 1; MHI Ref: UAP-HF-09292, dated 6/9/09): The following MHI responses provided in the ANSI/ANS 59.51 comparison table provided in response to the referenced RAI are not acceptable and should be revised (section numbers are per the ANSI/ANS standard):

- Section 5.5.1 – The response states that “part of the pump discharge flow is returned to the fuel oil storage tank via the recirculation line.” As stated in the response to RAI 09.05.04-27 (9.5.4-22, see UAP-HF-09292, top of page 9.5.4-12), this recirculation function is only for periodic filtration and the revised Figure 9.5.4-1 shows the recirculation valve normally closed. The response to Section 5.5.1 should be revised accordingly.
- Section 6.2.4 – The response (bottom of page 9.5.4-15) states for the fuel oil storage tank enclosure that “In regions where low temperature exists for extended durations, a space heater, and/or tank heater, may also be provided to maintain fuel oil temperature within specification.” How and when will this requirement be determined? If this is a COL applicant’s responsibility, then a COL Action Item should be added. If MHI will make this determination, then the DCD should include this statement. For either approach, the criteria for when a heater is needed, should be provided in the DCD. In addition, any heating requirements for the fuel oil piping located in the pipe tunnel between the fuel oil storage tank enclosure and the GTG building should also be addressed.
- Section 6.2.4 – The response (bottom of page 9.5.4-15) states that ventilation is addressed in Section 9.5.8. However Section 9.5.8 does not address ventilation of the fuel oil storage tank enclosure. This is an accessible area and should be adequately ventilated or MHI should provide adequate justification for not providing ventilation. See also the response to Section 6.3.4 which states that “There is no ventilation provided for the fuel oil system.”
- Section 6.2.4 – The response (top of page 9.5.4-16) states that “fill and sample connections are located at grade elevation...”. However the revised Figure 9.5.4-1 shows the sample connection within the tank enclosure. Revise the response or figure to be consistent. Also, the 6.2.5 response states that “The fill line is above grade.”
- Section 6.2.5 – The response states that “fill line has a strainer located downstream of the isolation valve...” The revised Figure 9.5.4-1 identifies this as

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a duplex filter which is the ANSI/ANS requirement. Revise the response to change “strainer” to “filter”.

- Section 6.2.5 – The response to the ANSI/ANS fire protection requirements for fuel oil system does not mention fire detection or suppression for this system. According to Section 9.5.1 of the US-APWR DCD, automatic sprinklers and smoke detectors are provided in the Class 1E GTG rooms which also house the fuel oil day tanks. The provision of sprinklers in the GTG rooms meets the guidance of RG 1.189, Regulatory Position 6.1.8 for emergency diesel generators. However, the fuel oil storage tank enclosure is not addressed in Appendix 9A. Regulatory Position 7.4 notes that automatic fire suppression should be provided for aboveground oil storage, including those tanks located in separate buildings. While the US-APWR fuel oil storage tanks are not aboveground, they are located in a separate building that contains safety-related equipment. Based on the quantity of combustible material in the storage tank enclosure, the NRC staff believes that detection and automatic suppression should be provided for these areas. In addition, Regulatory Position 6.1.8 notes that automatic suppression should be provided for any lubricating oil fires. At elevation 26’-4” of the power source building there are rooms shown on Figure 9A-11 and identified as GTG Auxiliary Component Room. The Table 9A-2 indicates that these rooms contain lube oil. MHI should provide justification for not protecting these rooms with automatic suppression systems in accordance with RG 1.189.
- Section 6.3.3.1 – The response notes that “pressure indicators and a differential pressure alarm on the fuel oil transfer pump discharge strainers are provided.” This should refer to the fuel oil transfer pump suction strainers. The response should be revised to be consistent with Figure 9.5.4-1, etc.
- Revised DCD Text – A statement has been added regarding the aboveground protection for the fill and vent lines. If the sample line also extends aboveground, as noted elsewhere and questioned by the NRC staff, it should be protected as well.

Additional changes may be required based on the response to this supplemental Question/RAI.

09.05.04-45

Supplement to Question No. 09.05.04-11 (RAI 9.5.4-06; RAI Set No. SBPB 318-2227, Rev. 1; MHI Ref: UAP-HF-09292, dated 6/9/09): As noted in the discussion for Question 09.05.04-10, the termination of the sample connection is not consistently described by MHI. In addition, this response states that the sample is from the top of the tank and measures sediment and water. MHI should describe how the sample will be removed against gravity from the top of the tank and explain how a sample from the top will monitor sediment and water, both of which are most likely to be on the bottom of the tank.

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09.05.04-46

Supplement to Question No. 09.05.04-13 (RAI 9.5.4-08; RAI Set No. SBPB 318-2227, Rev. 1; MHI Ref: UAP-HF-09292, dated 6/9/09): A goose neck and screen do not necessarily prevent plugging of vents. Insects can build nests over the screen that could potentially block the flow path. Outdoor vents should be periodically inspected for any obstructions. Revise the DCD to address this inspection requirement.

09.05.04-47

Supplement to Question No. 09.05.04-22 (RAI 9.5.4-17; RAI Set No. SBPB 318-2227, Rev. 1; MHI Ref: UAP-HF-09292, dated 6/9/09): While the NRC recognizes that Figure 9.5.4-1 is a schematic diagram, the revised drawing clearly indicates that the pump suction connection on the tank is at the top of the tank and extends down internally from the top of the tank to the bottom of the tank. This diagram leaves in question the means of ensuring a flooded suction for the pumps. The check valve shown on the revised figure may maintain a flooded suction once the suction line is filled, but check valves can leak and create an air gap that could prevent the oil transfer function. The design should provide assurance that adequate suction pressure will be maintained.

09.05.04-48

Supplement to Question No. 09.05.04-42 (RAI 9.5.4-37; RAI Set No. SBPB 318-2227, Rev.1; MHI Ref: UAP-HF-09292, dated 6/9/09): While RG 1.189 permits day tanks to be located in the same room as the engine-generator, the acceptance criteria also stipulates that the tank be located within a diked enclosure with 110% capacity or a drain to a safe location. Revised Figure 9.5.4-1 indicates a curb, but does not state that the curb will hold 110% of the day tank volume or that the curbed area is drained to a safe location. The DCD should be revised to state how the spill containment design conforms to the guidance in RG 1.189.

09.05.04-49

The draft interim guidance document, "Interim Guidance on the Review of Nuclear Power Plant Designs using a Gas Turbine Driven Standby Emergency AC Power System", includes the following guidance:

The emergency gas turbine generator should be designed and built to appropriate standards such as ISO 3977 "Gas Turbine Procurement Part 3 Design Requirements," 2004. Add this standard as a design basis for the US-APWR GTGs and identify and justify any deviations from this standard. As an alternative, propose some other appropriate industry standard that is specific to the type of gas turbine generators proposed for the US-APWR and address any deviations.

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Note: This RAI also applies to the GTGs as described in DCD Tier 2 Section 8.3 and GTG support systems described in DCD Tier 2 Sections 9.5.6, 9.5.7 and 9.5.8.