

REQUEST FOR ADDITIONAL INFORMATION 441-3461 REVISION 1

8/18/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 10.04.06 - Condensate Cleanup System

Application Section: 10.4.6

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects)
(CIB1)

10.04.06-8

Background

The DCD (Table 10.3.5-3) gives concentration limits for the impurities Na, Cl, and SO₄ during heatup which are higher than the limits specified in the EPRI Guidelines (Reference 1). In RAI 10.04.06-6 (Reference 2), the staff requested that the applicant provide justification for these higher limits. The applicant responded (Reference 3) with a detailed defense of the higher limits. The EPRI Guidelines (Table 5-3) define both limits and consequences for violation of those limits. Because MHI has chosen a different standard, the consequences for violation of concentration limits are not well defined. In addition, their reply appears slightly inconsistent with the information in DCD Table 10.3.5-1 (Note 4).

Requested information

- 1) Describe the consequences or corrective actions for violation of the limits in Table 10.5.3-3. If these consequences are different from the analogous consequences in the EPRI Guidelines (Table 5-3), the applicant should supply a thorough justification.
- 2) Justify the wording of DCD Table 10.3.5-1 (Sheet 4 of 4), Note 4, where it states that damage occurs for pH > 10, but the recommended limit is pH < 11. Reconcile these limiting values with those mentioned in Reference 3.

References

1. *Pressurized Water Reactor Secondary Water Chemistry Guidelines*, Rev. 6, Electric Power Research Institute (December 2004).
2. "Request for Additional Information No. 383-3002 Revision 1, SRP Section: 10.04.06 – Condensate Cleanup System, Application Section: 10.4.6" dated June 8, 2009. (ADAMS Accession No. ML091620122)

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3. Letter from Yoshiki Ogata, MHI, to NRC dated July 6, 2009; Docket No. 52-021 MHI Ref: UAP-HF-09364; Subject: MHI's Response to US-APWR DCD RAI No. 383-3002 (ADAMS Accession No. ML091910255).

10.04.06-9

Background

In RAI 10.4.6-7 (Reference 1), the staff requested that the applicant justify inconsistencies for control values in DCD Tables 10.3.5-1, 10.3.5-2, and 10.3.5-3 with the Action Levels 1, 2, and 3 values recommended by the EPRI Guidelines. In response to RAI 10.4.6-6 (Reference 3), the applicant explained differences in the limits for DCD Table 10.3.5-3, as noted above. Also, in response to RAI 10.4.6-7 (Reference 2), the applicant compared control values from all three DCD tables to analogous values from tables in the EPRI Guidelines, noting that there was general agreement. In fact, as the staff has previously noted, limits for EPRI Action Level 1 are fully consistent with values in the DCD. However, the EPRI Guidelines mention Action Level 2 and 3 limits and consequences during normal operation for several parameters, and these are not mentioned in the DCD, nor in the applicant's response to any of the RAI that have requested such information.

Requested Information

Supply Action Level 2 and 3 limits during normal operation that would be recommended to COL applicants for blowdown concentrations of Na, Cl, and SO₄, and feedwater dissolved O₂. Supply Action Level 2 limits for condensate dissolved O₂. Also, supply a description of the recommended consequences and corrective actions to be taken by plant personnel for violations of these limits.

References

1. "Request for Additional Information No. 383-3002 Revision 1, SRP Section: 10.04.06 – Condensate Cleanup System, Application Section: 10.4.6" dated June 8, 2009. (ADAMS Accession No. ML091620122)
2. Letter from Yoshiki Ogata, MHI, to NRC dated July 6, 2009; Docket No. 52-021 MHI Ref: UAP-HF-09364; Subject: MHI's Response to US-APWR DCD RAI No. 383-3002 (ADAMS Accession No. ML091910255).

10.04.06-10

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Background

The EPRI Guidelines (Table 5-5) recommend measurement of pH, cation conductivity, hydrazine, pH-control agent, and silica in blowdown water (Reference 1). The applicant's response to RAI 10.6.4-7 (Reference 2) described applicant's justification for eliminating measurement of pH, cation conductivity, hydrazine, and silica in blowdown samples. The applicant reasons that the first three quantities are adequately accounted for by continuous sampling of the feedwater. They do not specify any measurements for silica in recirculating water (i.e., blowdown, feedwater, or condensate), although they describe monitoring makeup water to ensure silica entering the system is low. However, the DCD (10.3.5.2) states that a major source of contaminants into the secondary system occurs through the condenser, and this plan would not monitor silica ingress through this route, or any pathway other than makeup water. Finally, the applicant does not mention any direct measurement of the pH control agent, whose value is used to check for consistency in other variables.

Requested information

1. What successful operating experience can be cited to verify the lack of blowdown sampling for pH, cation conductivity, hydrazine, and silica?
2. How will silica ingress from sources other than make-up water be monitored and controlled?
3. What direct measurements will be conducted for pH-control agent?

References

1. *Pressurized Water Reactor Secondary Water Chemistry Guidelines*, Rev. 6, Electric Power Research Institute (December 2004).
2. Letter from Yoshiki Ogata, MHI, to NRC dated July 6, 2009; Docket No. 52-021 MHI Ref: UAP-HF-09364; Subject: MHI's Response to US-APWR DCD RAI No. 383-3002 (ADAMS Accession No. ML091910255).