

## REQUEST FOR ADDITIONAL INFORMATION 637-4988 REVISION 2

9/23/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 06.02.02 - Containment Heat Removal Systems

Application Section: 6.2

QUESTIONS for Containment and Ventilation Branch 2 (ESBWR/ABWR Projects) (SBCV)

06.02.02-58

From June 7-9, 2010 the staff conducted an audit of the US-APWR suction strainer. The strainer head loss testing for US APWR was designed to accumulate debris on the strainer with minimal debris settlement. During the test, after all the non-chemical particulate was added, the staff noted a floating, foamy layer of debris, ranging from a thin layer to several inches thick, covering a significant portion of the test tanks water surface. After completing the fiber debris additions, the staff also noted some fiber debris held up on the surface of the water in the test tank and where piping and other components penetrated the water surface. Based on observation, it appears that air ingestion (bubbles) occurred during debris introduction and was interacting directly with the debris creating the floating masses. Just as debris settlement prevents debris from contributing to strainer head loss, so too does floating debris. The staff considers floating debris in the test to be inconsistent with the test intent to address debris accumulation on the strainer. Therefore the staff requests MHI to evaluate the impact on strainer head loss if the floating debris had transported/accumulated on the strainer and address the following questions: What amounts and types of debris were floating?

What are the principal phenomena that would contribute to debris floating? Was the phenomena modeled conservatively or prototypically in the test? Explain why it is acceptable for the test to permit floating as a debris removal mechanism given how the principal phenomena were scaled.

06.02.02-59

Near the conclusion of the thin bed testing on June 9, 2010, MHI and its contractors realized that the sensing lines of the differential pressure (dP) transmitters contained air. The air was cleared from the lines upon realizing this, and immediately the head loss rose approximately 2 ft. The staff's concern is that the air introduced uncertainty in the test data. The staff requests MHI to explain the causes for the air in the sensing line and the impact of this air on test results.

06.02.02-60

During chemical effects testing on June 9, 2010 the staff was informed by the applicant that an unexpected test result occurred and that other options would be explored to meet the design basis of the strainer. The staff noted a head loss of 4.7 ft at 120°F at the time of the unexpected test result. The applicant should describe how the unexpected test result will be evaluated in order to meet the acceptance criteria described in Technical Report MUAP-08001-P, Revision 2, US-APWR Sump Strainer Performance.