

REQUEST FOR ADDITIONAL INFORMATION NO. 70-1152 REVISION 0

9/8/2008

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants

Application Section: 14.2 Initial Plant Test Program

CQVP Branch

QUESTIONS

14.02-87

RAI 1152, Question 3969 addresses MHI's original response to RAI 550, Question 1895. RAI 550, Question 1895 was originally forwarded to MHI as RAI No. 27, Question No. 14.02-9. The subject of RAI No. 27, Question No. 14.02-9 was MHI's designation of the Natural Circulation Test documented in DCD Subsection 14.2.12.2.3.9 as a "First-Plant-Only Test."

The NRC staff does not agree with MHI's response to RAI No. 27, Question No. 14.02-9. MHI's response reiterates that natural circulation testing for the US-APWR is a first-plant-only test. On the basis stated below, the NRC staff requests, once more, that MHI revise the relevant portions of the US-APWR DCD to require natural circulation testing to be conducted on every plant.

The primary objectives of a suitable initial test program are to (1) provide additional assurance that the facility has been adequately designed and, to the extent practical, to validate the analytical models and verify the correctness or conservatism of assumptions used to predict plant response to anticipated transients and postulated accidents, and (2) to provide assurance that construction and installation of equipment in the facility have been accomplished in accordance with design. Other key objectives are to familiarize the plant's operating and technical staff with the operation of the facility and to verify by trial use, to the extent practical, that the facility operating procedures and emergency procedures are adequate.

Appendix A, 4.t, of RG 1.68 recommends the performance of natural circulation tests of the reactor coolant system to confirm that the design heat removal capability exists, or to verify that flow (without pumps) or temperature data are comparable to prototype designs for which equivalent tests have been successfully completed.

In Westinghouse's AP1000 design, natural circulation heat removal to cold conditions using the steam generators is not relied upon as a safety-related design feature unlike current PWR plants. Because of its "passive" nature, natural circulation in the AP1000 is achieved through the passive residual heat removal (PRHR) system. Because the PRHR heat exchanger serves as the safety-related heat sink for the AP1000 design, the staff determined that natural circulation testing through the PRHR, rather than the

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reactor coolant system and steam generators, met the intent of Appendix A, 4.t, of RG 1.68.

Regarding the US-APWR design, the staff notes that natural circulation is not a design feature in the US-APWR design, nor does it constitute a new, or unique design feature as confirmed by MHI's original response to RAI 550, Question 1895. In traditional PWR designs, natural circulation test demonstration not only provides benchmark data (temperature, flow) for the operator simulator, but also allows for operator training and familiarity of plant behavior under these unique circumstances. This is consistent with TMI Action Item I.G.1, that requires the development and implementation of procedures and training programs during the low-power testing phase of the initial test program. The goal of these programs is to increase the capability of shift crews to operate facilities in a safe and competent manner by assuring that the training for plant changes and off-normal events was conducted. These programs provide "hands on" training for plant evaluation and off-normal events for each operating shift.

Therefore, the staff disagrees with MHI's determination that natural circulation testing for the USAPWR is a first-of-a-kind test as defined in RG 1.68, Appendix A.6. Please revise the relevant portions of Subsections 14.2.8.1, 14.2.8.1.2 and 14.2.12.2.3.9 of the US-APWR DCD to reflect that this test will be conducted on every plant.