

## Jeff Ciocco

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**From:** Jeff Ciocco  
**Sent:** Tuesday, July 01, 2008 7:35 AM  
**To:** us-apwr-rai@mhi.co.jp  
**Cc:** Andy duBouchet; Juan Peralta; Ngola Otto; Larry Burkhart; Harrison Botwin  
**Subject:** US-APWR Design Certification Application RAI No. 27  
**Attachments:** US-APWR DC RAI 27 CQVP 550.pdf

MHI,

Attached please find the subject request for additional information (RAI). This RAI was sent to you in draft form. The schedule we are establishing for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule. Please submit your RAI response to the NRC Document Control Desk.

Thanks,

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# REQUEST FOR ADDITIONAL INFORMATION NO. 27 REVISION 0

7/1/2008

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

14.02-8

Standard Review Plan (SRP) Section 14.2, Revision 3, and Regulatory Guide (RG) 1.68, Revision 3, describe the scope and detail the NRC staff considers acceptable for an applicant's Initial Test Program (ITP). SRP Section 14.2 provides specific acceptance criteria for Design Certification (DC), Combined License (COL), and Operating License (OL) applicants. The NRC staff documented this guidance based on previous acceptance criteria that required a general description of the plant administrative controls in the DC application and a detailed description of the plant administrative controls in the COL application. Based on recent experience with DC reviews, the NRC staff now considers that the majority of the plant administrative controls can be described in the DC application. Augmenting MHI's US-APWR DC with this additional information would enable greater standardization of the COL ITPs and permit more efficient NRC staff reviews of the COL ITPs.

Section 14.2 of MHI's US-APWR DC application documents general administrative controls for the ITP and provides test abstracts for each individual test conducted during the ITP. The NRC staff recommends that Section 14.2 of MHI's US-APWR DC application be augmented to establish the majority of the requirements COL licensees will use to conduct an ITP. This additional information would address all or parts of the combined license information items COL 14.2(2) through COL 14.2(8) currently documented in MHI's US-APWR DC Section 14.2.13. Each COL holder would then use Section 14.2 of MHI's US-APWR DC application to establish the site-specific procedures or instructions required to implement an ITP.

In order to address, on a generic basis, the administrative controls that will be implemented during the execution of the ITP, MHI should describe the general methodology that will be implemented by applicants that reference the US-APWR DC in the following areas:

- ITP objectives
- Organizational and staffing responsibilities
- A process for test procedure development, issuance, review, approval, distribution, control, and modifications
- Conduct of the ITP (including plant modifications and prerequisites)

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- Review, evaluation, and approval of test results (including methods and schedules for approval of test data for each major phase and methods used for reviews of individual parts of multiple tests)
- ITP planning and scheduling
- Initial fuel loading, initial criticality, low-power testing, and power ascension tests
- Conformance with Regulatory Guides (RGs)
- Utilization of reactor operating and testing experience in test program development
- Trial use of plant operating and emergency procedures

Although MHI can address the majority of these areas on a generic basis, the staff recognizes that only the COL applicant can address certain site-specific or licensee-specific areas. Section 14.2 of MHI's US-APWR DC application should, therefore, identify the following areas as COL information items:

- A description of the site-specific organizational structure, including the identification of principal participants and the degree of participation of each organizational unit, based on the general requirements contained in Section 14.2 of the US-APWR DC application.
- A site-specific schedule, relative to the fuel loading date, for conducting each major phase of the ITP, based on the general provisions contained in Section 14.2 of the US-APWR DC application.
- The submittal of test specifications and test procedures for review by NRC onsite inspectors at least 60 days before their intended use.

MHI's incorporation of a generic set of detailed administrative controls in the US-APWR DC application will increase the level of standardization of the DC material that future COL applicants will reference. Using this approach would allow the NRC staff to reduce the number of COL information items in MHI's US-APWR DC application and provide a clear description of the areas where COL applicants need to provide information to address site-specific or licensee-specific areas. Except for ITP-related license conditions that will be identified by COL applicants referencing the US-APWR DC, the staff anticipates that the detailed plant administrative controls in Chapter 14.2 of the US-APWR DC will be identified as Tier 2\* information. Accordingly, the NRC requests that MHI incorporate a greater level of detail into the plant administrative control sections of Chapter 14.2 of the US-APWR DC application consistent with the objectives outlined above.

### 14.02-9

Section 14.2.8.1 of the US-APWR DCD designates the Natural Circulation Test documented in DCD Section 14.2.12.2.3.9 as a "First-Plant-Only Test."

DCD Section 14.2.8.1.2 indicates that:

"The natural circulation test using steam generators (SGs) is performed in the startup test phase of the first US-APWR as a prototype test. It is unnecessary for following

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plants to compare flow and temperature data (without reactor coolant pumps [RCPs]) and temperature data to that of this plant because no design differences exist that would significantly affect natural circulation capabilities.”

As stated in Appendix A.6 to RG 1.68, first-of-a-kind (FOAK) tests are defined as new, unique, or special tests for new design features associated with SSCs that are part of a new reactor design under 10 CFR Part 52. Further, Appendix A.6 to RG 1.68 states that the NRC staff accepted the natural circulation test proposed by Westinghouse for the AP1000 plants as a FOAK test to be performed for the first-plant-only. This test will be performed to verify natural circulation of reactor coolant through the steam generators and the passive residual heat removal heat exchanger (PRHR HX) during the low-power test phase. The PRHR HX is considered a new and unique design feature within the AP1000 design.

With regards to the US-APWR, the NRC staff notes that the natural circulation mode for the US-APWR does not include new, unique, or special design features that require FOAK-like testing. Rather, the natural circulation mode demonstrates decay heat removal capability of the US-APWR through natural circulation by tripping the Reactor Coolant Pumps and utilizing the automatic actuation of the Emergency Feedwater System.

MHI needs to provide additional information to justify that natural circulation is a new, unique, or special design feature in the US-APWR that warrants treatment as a “First-Plant-Only Test,” or otherwise revise the US-APWR DCD to conduct the requisite testing consistent with the guidance in Appendix A.4.t to RG 1.68.