
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

1/31/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 660-5134 REVISION 2
SRP SECTION: 03.07.02 – Seismic System Analysis
APPLICATION SECTION: 3.7.2
DATE OF RAI ISSUE: 11/15/10

QUESTION NO. RAI 03.07.02-34 (03.07.02-61):

This request for additional information (RAI) is necessary for the staff to determine if the application meets the requirements of 10 CFR Part 50, Appendix A, General Design Criteria 2; 10 CFR Part 50 Appendix S; and 10 CFR Part 100; as well as the guidance in NUREG-0800, 'Standard Review Plan for the Review of Safety Analysis for Nuclear Power Plants,' Chapter 3.7.2, "Seismic System Analysis."

In MHI's Topical Report, MUAP-10006 (R0), the last paragraph of Section 3.5 and also Table 3-13 indicate that the vertical in-structure response spectra (ISRS) for the three gas turbine generators (GTGs) and the GTG panels are developed by averaging the vertical response at two representative nodes within the GTG footprint area. This is in contrast to the other ISRS presented in Table 3-13 where the ISRS are developed as an envelope of representative nodal responses. The staff requests that the applicant provide the technical justification for using an averaging process instead of an enveloping process when developing the vertical ISRS for the GTGs and panels.

ANSWER:

This answer revises and replaces the previous MHI answer that was transmitted by letter UAP-HF-10355 (ML110040071).

The US-APWR standard plant design has been updated such that power source buildings (PS/Bs), the auxiliary building (A/B), and the essential service water pipe chase (ESWPC) are integrated to the reactor building (R/B) structure to form the updated design configuration of the R/B complex on a larger common basemat foundation. Section 03.3.6 of Technical Report MUAP-10006, Rev. 3 describes the methodology used to develop in-structure response spectra (ISRS) that are used for the design and qualification of category I and II equipment, piping and components. ISRS are developed based on the responses calculated for the nodes within the footprint/support of the equipment for which the ISRS are considered. The methodology used to develop the vertical ISRS for the gas turbine generators (GTGs), and for the GTG panels, has been revised. These ISRS are developed using the same methodology as the rest of the design ISRS, by enveloping the responses at the grouped nodes in order to capture effects of the potential non-uniform input at their support locations including the rocking and torsional effects.

For example, Figures 3-A.2.0-7 and 3-A.2.0-8 of MUAP-10006, Appendix 3-A depict the locations of the two groups of five nodes used for development of ISRS for A-AAC and B-AAC GTGs, respectively. The nodal coordinates are listed in Table 3-A.1.1-1 of MUAP-10006. Figures 3-B.1.0-19 through 3-B.1.0-24

present the revised design ISRS for A-AAC and B-AAC GTGs that represent the envelope, not the average, of the response from all five nodes within each GTG footprint.

Impact on DCD

There is no impact on the DCD.

Impact on R-COLA

There is no impact on the R-COLA.

Impact on S-COLA

There is no impact on the S-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Technical/Topical Report

There is no impact on a Technical/Topical Report.

This completes MHI's response to the NRC's question.