REQUEST FOR ADDITIONAL INFORMATION 287-2041 REVISION 1

3/25/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 03.02.01 - Seismic Classification

Application Section: 03.02.01

QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR Projects) (EMB2)

03.02.01-1

DCD Subsection 3.2.1, page 3.2-2, 4th paragraph, last sentence defines non-seismic (NS) SSCs that must maintain their structural integrity are designated as seismic Category II. DCD Subsection 3.2.1.1.3 defines non seismic (NS) as those SSCs not classified as seismic category I or seismic category II. Since NS is not the same as Seismic Category II, clarify why the term non-seismic (NS) is used to define seismic Category II in Subsection 3.2.1.

03.02.01-2

In DCD Subsection 3.2.3, COL 3.2(4) and 3.2(5) identify that the COL applicant is to identify site-specific SSCs. SRP 3.2.1 identifies plant features of the Ultimate Heat Sink (UHS) including (1) dams, (2) ponds, and (3) cooling towers to be Seismic Category I. Identify which site-specific SSCs are to be classified in the COLA and if these UHS plant features are site-specific SSCs.

03.02.01-3

SRP 3.2.1 allows the use of tables to identify those SSCs that are designated Seismic Category I and the table should identify all activities affecting the safety-related functions of these Seismic Category I plant features that should also meet GDC 1 and Appendix B requirements. DCD Table 3.2-2 identifies which SSCs apply 10 CFR 50 Appendix B, but Table 3D-2 does not identify what QA requirements apply to seismic Category I or II SSCs. Explain how the DCD Tables identify all activities affecting safety-related functions, as described in the SRP.

03.02.01-4

10 CFR Part 52.47 identifies that the Commission will require prior to design certification, that information normally contained in certain procurement specifications and construction and installation specifications be completed and available for audit. The applicant is requested to clarify if the design basis information on seismic classification for all important to safety SSCs within the scope of the DCD, including structures, is included in specifications and if this information is now available for audit.

03.02.01-5

The risk insights report for the APWR (Risk Insights for the Review of US APWR Design R0) identifies the Leak Detection System (LDS) for the Reactor Coolant Pressure Boundary (RCPB) as having a high importance. DCD Subsection 3.1.2.5.1states: "Instrumentation is provided to detect significant leakage from the RCPB with indication in the MCR (see Section 5.2)." However, Section 5.2.5.5 states: "Leak detection monitoring has no safety-related function." DCD Table 17.4-1 identifies risk-significant SSCs, but the LDS does not appear to be included. Clarify the risk significance of the leak detection system and if the RCPB LDS belongs under the Phase 1 D-RAP program as discussed in section 17.4 of the DCD.

Also, if this system does belong under the Phase 1 D-RAP program, discuss where in DCD Subsections 3.2, 17.4.7.1 and Table 17.4-1 this system has been identified and if augmented requirements such as a graded approach is to be applied to the seismic design and QA.

03.02.01-6

R.G. 1.29 states in Regulatory Position C.2 that SSCs whose continued function is not required but whose failure could reduce the functioning of SSCs required to function should be designed and constructed so that the SSE would not cause failure. In addition, R.G. 1.29 states in Regulatory Position C.4 that pertinent quality assurance requirements of Appendix B to 10 CFR Part 50 should be applied to these SSCs. Subsection 3.2.1.1.3 of the DCD, last paragraph states that "For NS items located in the proximity of safety-related SSCs that are upgraded to seismic category II, the pre-assigned equipment class remains unchanged". This could result in a lower level of QA requirements than is what is required for seismic category II, which would not be acceptable. For example, Table 3.2-2, sheet 41 states that the PCCV polar crane is Equipment Class 5, Seismic Category II, but indicates that 10 CFR50 Appendix B is not applicable. Clarify how the NS items upgraded to Seismic Category II meets the pertinent QA requirements in Appendix B to 10 CFR Part 50.

03.02.01-7

R.G. 1.29 states in Regulatory Position 4 that the pertinent quality assurance requirements of Appendix B to 10 CFR Part 50 should be applied to SSCs which Section 3.2.1.1.2 of the DCD defines as Seismic Category II. In addition, Section 3.2.1.1.2 states that pertinent QA requirements of 10 CFR 50, Appendix B will be used for Seismic Category II. However, Table 3.2-2, page 3.2-17 and page 3.2.56 for example, indicates that 10 CFR 50, Appendix B is not applicable for numerous systems and components that are seismic category II. Clarify to what extent 10 CFR 50 is applicable to Seismic Category II SSCs.

03.02.01-8

In DCD Table 3.2-2, page 3.2-47, the Equipment Class 6 (RWMS components) systems and components refer to RG 1.143 for the seismic category, which is in accordance with the SRP 3.2.1. DCD Table 1.9.1-1 identifies compliance with RG 1.143. However, RG 1.143 defines three hazard levels with different seismic design requirements for each level. Identify the specific hazard level for the Equipment Class 6 RWMS systems and components so that seismic requirements are identified.

03.02.01-9

R.G. 1.29 states in Regulatory Position C.1.I that the spent fuel storage pool structure, including the fuel racks should be Seismic Category I. DCD Table 3.2-2, page 3.2.55, specifies that the new fuel storage rack and spent fuel storage rack are Equipment Class 4 and Seismic Category I. However, DCD Subsection 3.2.2.4 states that Equipment Class 4 SSCs are classified as NS or Seismic Category II. Clarify the basis for this apparent discrepancy.

03.02.01-10

DCD Table 3.2-2, page 3.2-55, states the new and spent fuel storage racks will be seismic Category 1 but will not be subject to 10 CFR 50, Appendix B requirements. DCD Subsection 3.2.1.1.1 states Seismic Category 1 SSCs will meet the QA requirements of 10 CFR 50, Appendix B. Provide justification for these exceptions to the criteria in Subsection 3.2.1.1.1.

03.02.01-11

10 CFR Part 50, Appendix S, IV(a)(2)(i)(B)(I) states that SSCs necessary for continued operation without undue risk to the health and safety of the public must remain functional and within applicable stress, strain, and deformation limits when subject to the effects of the Operating Basis Earthquake (OBE) Ground Motion. SRP 3.2.1 states that, if the applicant has set the OBE Ground Motion to the value one-third of the SSE Ground Motion, then the applicant should also provide a list of SSCs necessary for continued operation that must remain functional without undue risk of the health and safety of the public and within applicable stress, strain and deformation, during and following the OBE. DCD Table 3.2-1 includes a list of nonsafety components needed for normal shutdown. Clarify why the list of SSCs included in Table 3.2-1 are only SSCs needed for shutdown rather than all SSCs needed for continued operation during and following OBE. Also explain how these nonsafety-related SSCs are classified such that they will be seismically qualified for OBE to remain functional.

03.02.01-12

GDC 2 of 10 CFR Part 50, Appendix A states the SSCs important to safety shall be designed to withstand the effects of natural phenomena, including earthquakes. Section 3.1.1.2.1 of the DCD uses the term safety-related and Section 3.2.1 uses both terms to identify the SSCs that must be designed to satisfy the requirements of GDC 2. Refer to

definitions in 10 CFR 50, memo to NRC Staff dated 11/20/81 from Harold Denton (accession numbers 8201200446 and 8201200448) and ANS 58.14 regarding application of these terms. Clarify the application of the terms "safety-related" and "important to safety" to the seismic classification of SSCs and compliance with GDC 2. Also clarify to what extent those SSCs that are important to safety that are not considered safety-related are seismically classified so that they are designed to withstand earthquakes.

03.02.01-13

DCD Tier 1 Chapter 2 and DCD Tier 2 Subsection 14.3 describe various ITAAC to confirm the ability of safety-related seismic Category I SSCs to withstand a design basis seismic event. It is not clear if there is a proposed ITAAC or DAC to address nonsafety-related Seismic Category II SSCs. Identify if there is an ITAAC or DAC to address Seismic Category II SSCs or explain why an ITAAC or DAC is not required.

03.02.01-14

It is not clear that all structures, systems and components (SSCs) that are within scope of the DCD and are not site-specific are included within scope of DCD Table 3.2-2. Certain potentially important to safety items such as non safety-related reactor vessel internals and the reactor vessel insulation do not appear to be specifically identified in Table 3.2-2. The applicant is requested to review the entire scope of SSCs that are not site-specific and include any missing items in Table 3.2-2. Also clarify if there is an ITAAC for such nonsafety-related, but important to safety SSCs such as non safety-related RPV internals and seismic Category II SSCs.