

REQUEST FOR ADDITIONAL INFORMATION 667-5235 REVISION 0

11/29/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 03.02.02 - System Quality Group Classification

Application Section: 3.2.2

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

03.02.02-17

GDC 1 of 10 CFR Part 50, Appendix A states in part that structures, systems, and components important to safety shall be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed. Section 3.1.1.1.1 of the DCD uses the term "safety-related" and Section 3.2.2 uses both terms to identify the SSCs that must be designed to satisfy the requirements of GDC 1. Refer to definitions in 10 CFR 50, the memo to NRC Staff dated November 20, 1981 from Harold Denton and ANS 58.14 regarding application of these terms. In RAI 03.02.02-7, the applicant was requested to clarify the application of the terms "safety-related" and "important to safety" to the quality group classification of SSCs and compliance with GDC 1. The applicant was also requested to clarify to what extent those SSCs that are important to safety that are not considered safety-related are classified so that they are designed to appropriate quality standards.

The definition of the term important to safety pertains to risk and the memorandum from Denton clarifies that safety-related and important to safety are not synonymous. Consistent with GDC 1, all SSCs that are important to safety are to be designed with appropriate quality standards commensurate with their safety function. Further, where generally recognized codes and standards are used, they shall be identified and evaluated to determine their applicability, adequacy, and sufficiency and shall be supplemented or modified as necessary to assure a quality product in keeping with the required safety function. A quality assurance program shall be established and implemented in order to provide adequate assurance that these structures, systems, and components will satisfactorily perform their safety functions. Based on DCD Chapter 19, risk-significant SSCs are to be determined by the PRA and are not limited to safety-related SSCs. The RAI 03.02.02-7 response does not mention risk significant SSCs or the PRA process to classify nonsafety-related risk-significant SSCs in regard to quality group. In RAI 03.02.02-14, the applicant was requested to provide clarification of how SSCs that are non-safety-related, but are risk-significant and important to safety, are identified and classified with respect to the determination of appropriate quality standards and any special treatment. The applicant was also requested to replace the term "safety-related" with the term "important to safety" in DCD 3.2.2 and 3.1.1.1 in order to be consistent with GDC 1.

The RAI response states that based on the PRA process described in Section 17.4, the risk-significant, non safety-related SSCs that are listed in Table 17.4-1 for Seismic Event (SM) in the "Rational" column will be categorized as Seismic Category I and classified as Equipment

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Class 5 and references the response to RAI 03.02.02-10 concerning changes made to the DCD.

Various industry documents such as NEI 04-01 and ANS 58.14 address the need for special requirements for important nonsafety-related SSCs. NEI 04-01 specifically identifies that the NRC/Industry issue of how and which Appendix B requirements will be implemented for important to safety equipment remains unresolved and GL 84-01 did not resolve the issue. The NEI document further states that some portion of this issue was resolved in the design certification process, if equipment quality classes were part of the certification approval. Although the RAI 03.02.02-14 response appropriately references the PRA process to identify risk-significant SSCs and PRA for consideration of seismic events, NRC Staff is concerned that the RAI response does not address changing the term “safety-related” to “important to safety” in DCD subsection 3.1.1.1 and has not clearly explained the process to apply the terms important to safety and safety-related to the classification process to satisfy GDC 1.

Therefore, the term “safety-related” should be replaced with the term “important to safety” in DCD subsection 3.1.1.1 and the applicant should clearly explain the process to apply the terms important to safety and safety-related to the classification process to satisfy GDC 1. For example, there could be a unique classification or explanatory notes added to Table 3.2-2 to identify risk-significant nonsafety-related SSCs for special treatment. Other than for Seismic Category II SSCs, no QA requirements or any special treatment requirements are identified in DCD Tables 3.2-2 and 3.2-3 for Equipment Class 4 and 5 components that may be risk-significant.

03.02.02-18

ASME Section III Code Class' are included in Tier 1 ITAAC design descriptions. DCD Subsection 14.3.4.4 identifies that ITAAC are specified to verify ASME Code Classifications. DCD Table 3.2-3 correlates ASME Section III Code Class 1, 2 and 3 to NRC QG A, B and C, respectively. As a result, it is understood the as-built QG classifications A, B, C will be verified for safety-related pressure retaining systems, components and their supports. Based on the changes to the QA Program described in DCD Chapter 17, it is also understood that there are to be ITAAC for nonsafety-related risk-significant SSCs included in D-RAP. However, it is not clear which specific ITAAC are to be used to verify as-built classification of ASME Code Class and nonsafety-related QG D systems and components that may be important to safety. In RAI 03.02.02-15, the applicant was requested to confirm that QG classifications for all important to safety SSCs, including those considered risk-significant that are not safety-related, will be verified and to identify the specific ITAAC used for these verifications.

The RAI response clarified that DCD Section 14.3 identifies the key design features which are based on SRP 14.3 guidance. The response noted that SRP 14.3 does not identify Seismic Category II as criteria for safety significant design features and does not require a generic Seismic Category II ITAAC although some non-safety SSCs were determined to require an ITAAC to verify the as-built design is Seismic Category II based on the review of design documents or on a basic walk-down inspection. An example where a non-safety SSC is verified as seismic II is identified in Tier 1 Section 2.7.6.4, Light Load Handling System, Table 2.7.6.4-2, ITAAC 2B.

Although the response identified examples of ITAAC for nonsafety-related SSCs, the RAI response did not address an ITAAC for verification of nonsafety-related risk-significant QG D systems that may be important to safety. The requirement for an ITAAC for a seismic systems interaction walkdown is to be considered in the review of Sections

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3.7 and 14.3.2. Staff believes that an ITAAC is appropriate for this verification of important to safety SSCs, including Seismic Category II SSCs, that are not considered safety-related. Until it is demonstrated that an adequate ITAAC or other verification process exists, for all applicable nonsafety-related SSCs, this concern is unresolved. Therefore, the applicant is requested to establish that an adequate ITAAC or other verification process exists for all applicable non-safety-related mechanical systems.

03.02.02-19

QG D systems are those that contain or may contain radioactivity that are not included in QGs A, B or C. Equipment Class 4 and Equipment Class 8 added in Revision 2 include nonsafety-related systems and components that contain radioactive material. Based on its review of the information in DCD Tier 2, Section 3.2.2, Tables 3.2-2, 3.2-3, and the applicable simplified P&IDs, the staff has determined that the classifications for QG D SSCs of the US-APWR are, in general, consistent with the guidelines in SRP Section 3.2.2 and RG 1.26 and in conformance with GDC 1, and therefore they are acceptable. However, systems such as the circulating water system (CWS) are not classified as QG D to be consistent with SRP 10.4.5 and in RAI 03.02.02-13, the applicant was requested to explain why the CWS is not considered QG D. The applicant was also requested to verify that all systems that may contain radioactivity are appropriately classified consistent with QGs A, B, C, or D and designed to RG 1.143.

The RAI response stated that the US-APWR CWS is not safety-related and it does not have any safety-related components or functions. The CWS is not a RWMS. It is designed and operated to minimize the potential for radioactive contamination. The system is not expected to be radioactively contaminated during normal plant operations and even under transient conditions involving radioactive contamination of the secondary side of the plant, the CWS is not expected to contain measurable amounts of radioactive materials. Therefore, the QG of US-APWR CWS components is not classified as QGs B, C, or D components in RG 1.26 and the guidance provided in RG 1.143 does not apply. Moreover, leakage due to CWS failure can not reach safety-related equipment located in Seismic Category I plant structures as described in DCD Subsection 3.4.1.3. Therefore, the CWS components equipment are classified as "Class 9", consistent with the definition provided in Subsection 3.2.2, with a QG of "N/A" as identified in the DCD Table 3.2-2.

Since the applicant identified that the CWS is not expected to contain measurable amounts of radioactive material, staff concludes that the CWS need not be QG D. All issues associated with the DCD Section 3.2.2 quality group classification of CWS are closed. However, the applicant did not address other nonsafety-related systems outside the scope of RG 1.143 that may contain radioactive material.

Clarify if other nonsafety-related systems that may contain radioactivity that are not classified as QG A, B or C, are either radwaste systems consistent with RG 1.143 or are classified as QG D consistent with RG 1.26.