

REQUEST FOR ADDITIONAL INFORMATION 242-2153 REVISION 0

3/2/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 14.03.03 - Piping Systems and Components - Inspections, Tests, Analyses, and
Acceptance Criteria
Application Section: 14.3.3

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

14.03.03-1

In Tier 2, Section 3.12.5.7, the applicant identified that the requirements delineated in RG 1.207, Rev 1 concerning environmental impact on fatigue of ASME Code Section III Class 1 piping will be followed. In particular RG 1.207 provides guidance to be used in determining the acceptable fatigue life with the consideration of the light-water reactor environment. The requirements in the RG are more stringent than those design criteria in the ASME Code Section III. In Tier 1, Table 2.3-2, the applicant stated in the ITAAC that Class 1 piping systems and components will be designed to meet ASME Code Section III requirements. In this ITAAC, the additional fatigue design requirements in RG 1.207 was not addressed. The staff requests the applicant to modify the ITAAC such that requirements of the ASME Code Section III and RG 1.207 will be met.

14.03.03-2

In Tier 1, Table 2.3.2 Item 3, the applicant stated in the Inspections, Tests, and Analyses (ITA) that an analysis of representative ASME Code Section III Class 2 or 3 piping systems and components that significantly contribute to risk will be performed. The AC further identified that the result of the analysis of those representative piping systems and components concluded that the design requirements of the ASME Code Section III are met. However, the design completion of those remaining Class 2 or 3 risk-significant as well as all Class 2 or 3 non risk-significant piping systems and components were not discussed. The staff does not consider the design of representative of Class 2 or 3 piping systems and components constitute the complete design of all Class 2 and 3 piping systems and components. The staff requests the applicant to modify the ITAAC reflecting that all Class 2 and 3 piping systems and components design will meet the requirements of the ASME Code Section III.

14.03.03-3

For piping systems and components designated as ASME Code Section III Class 1, 2 or 3, the Acceptance Criteria (AC) of Items 1 and 3 of Tier 1 Table 2.3-2 stated that the results of the analysis conclude that the piping systems and components have been designed and are in accordance with ASME Code Section III requirements. It is not clear to the staff how the results of the analysis will be documented and what type of report will exist. SRP 14.3.3 indicates that an acceptable version of an ASME Code

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certified stress report is the design document required by ASME Code Section III, Subarticle NCA-3550. A certified design report provides assurance that the requirements of ASME Code, Section III for design have been met and that the design complies with the design specifications. The staff requests the applicant to revise the AC to identify the certified Design Report as discussed in Subarticle NCA-3550 or other appropriate design documents.

14.03.03-4

In Tier 1, Table 2.2-4, Items 7, 8 and 17 referred to ITAAC in section 2.3. However, it referred to either a wrong ITAAC or a non-existing ITAAC. The staff requests the applicant to correct the error in those items in Table 2.2-4.

14.03.03-5

Components ITAAC

In USAPWR DCD Tier 1, Table 2.4.1-5, Item 5, the applicant stated in the Design Commitment that ASME Code components are designed and fabricated in accordance with the requirements of ASME Code Section III. In the ITA and AC, the "as-built" components were discussed. The two activities, Fabrication & Installation and As-built Reconciliation, should have separate ITAAC.

(a) Fabrication and Installation:

For components designated as ASME Code Section III, SRP 14.3.3 identifies that a certified data report provides assurance that requirements of the ASME Code, Section III for fabrication, installation, and examination have been met. The staff requests the applicant to include an ITAAC to reflect that an inspection of the components will be conducted. A certified ASME Code Data Reports and inspection reports should document that the components are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.

(b) As-built Reconciliation

Also described in SRP 14.3.3, the as-built ITAAC should identify that the components shall be reconciled with the design requirement. The staff requests the applicant to include an ITAAC to reflect that a reconciliation analysis using as-designed and as-built information and ASME Code certified Design Report will be performed.

These two questions are also applicable to Tier 1, Sections 2.4.2, 2.4.4, 2.4.5, 2.4.6, 2.7.1.2, 2.7.1.9, 2.7.1.10, 2.7.1.11, 2.7.3.1, 2.7.3.3, 2.7.3.5, 2.7.6.3, 2.7.6.7, 2.11.2, and 2.11.3

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14.03.03-6

Piping ITAAC

In USAPWR DCD Tier 1, Table 2.4.2-5, Item 4b, the applicant stated in the Design Commitment that ASME Code piping are designed and fabricated in accordance with the requirements of ASME Code Section III. In the ITA and AC, the "as-built" pipings were discussed. The two activities, Fabrication & Installation and As-built Reconciliation, should have separate ITAAC.

(a) Fabrication and Installation:

For piping designated as ASME Code Section III, SRP 14.3.3 identifies that a certified data report provides assurance that requirements of the ASME Code, Section III for fabrication, installation, and examination have been met. The staff requests the applicant to include an ITAAC to reflect that an inspection of the piping will be conducted. A certified ASME Code Data Reports and inspection reports should document that the piping system is fabricated, installed, and inspected in accordance with ASME Code Section III requirements.

(b) As-built Reconciliation

Also described in SRP 14.3.3, the as-built ITAAC should identify that the piping shall be reconciled with the design requirements. The staff requests the applicant to include an ITAAC to reflect that a reconciliation analysis using as-designed and as-built information and ASME Code certified Design Report will be performed.

These two questions are also applicable to Tier 1, Sections 2.4.4, 2.4.5, 2.4.6, 2.7.1.2, 2.7.1.9, 2.7.1.10, 2.7.1.11, 2.7.3.1, 2.7.3.3, 2.7.3.5, 2.7.6.3, 2.7.6.7, 2.11.2, and 2.11.3

14.03.03-7

Piping Supports as-built reconciliation ITAAC

As described in SRP 14.3.3, one ITAAC item that should be included is that the as-built piping supports shall be reconciled with the design requirements. In USAPWR DCD Tier 1 Table 2.4.2-5, an ITAAC for as-built reconciliation is not included. The staff requests the applicant to include an ITAAC for piping supports reflecting that a reconciliation analysis using as-designed and as-built information and ASME Code certified Design Report will be performed.

This question is also applicable to Tier 1, Sections 2.4.4, 2.4.5, 2.4.6, 2.7.1.2, 2.7.1.9, 2.7.1.10, 2.7.1.11, 2.7.3.1, 2.7.3.3, 2.7.3.5, 2.7.6.3, 2.7.6.7, 2.11.2, and 2.11.3

14.03.03-8

Pressure boundary welds

For pressure boundary welds of components and piping identified as ASME Code Section III, the applicant provided ITAAC Items 5a and 5b in Tier 1 Table 2.4.2-5. The

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AC stated that the ASME Code Section III requirements are met for non-destructive examination of the as-built pressure boundary welds. It is not clear to the staff how the proposed AC can be concluded by the ITA. The staff requests the applicant to append the phrase "An ASME Code Report exists and concludes" to the beginning of the AC.

This question is also applicable to Tier 1, Sections 2.4.1, 2.4.5, 2.4.6, 2.7.1.2, 2.7.1.9, 2.7.1.10, 2.7.1.11, 2.7.3.1, 2.7.3.3, 2.7.3.5, 2.7.6.3, 2.11.2, and 2.11.3

14.03.03-9

In Tier 1, Chapter 2, Table 2.4.4-3, Emergency Core Cooling Systems piping that are classified as Seismic Category I were identified. In Table 2.4.4-5, the applicant provided ITAAC Item 5b for seismic category piping. The Design Commitment used the words "seismic category lines" while "seismic category piping" and "as-built piping" were used in the AC and ITA. The AC also stated that each of the as-built seismic category piping identified in Table 2.4.4-3 meets the seismic category requirements.

a) It is not clear to the staff how the proposed AC can be concluded by the ITA. The staff requests the applicant to append the phrase "Report(s) documents that" to the beginning of the AC.

b) Seismic Category I is the only seismic classification identified in the section. To bring consistency among all the columns in the ITAAC as well as clarify the seismic category of the piping systems. The staff requests the applicant to change the words "seismic category lines" or "seismic category piping" to "Seismic Category I piping".

These questions are also applicable to Tier 1, Sections 2.4.2, 2.4.5, 2.7.1.2, 2.7.1.9, 2.7.1.10, 2.7.1.11, 2.7.3.1, 2.7.3.3, 2.7.3.5, 2.7.6.3, 2.11.2, and 2.11.3.

14.03.03-10

In Tier 1, Tables 2.4.1-2 and 2.4.2-5, there are ITAAC stated that the ASME Code Section III components are constructed of material in accordance with ASME Code requirements. In Tier 1, Section 2.4.5.1, subsection Seismic and ASME Code Classification, the applicant stated that the material used in the RCPB conform to the applicable ASME code rules. However, an ITAAC similar to that of Table 2.4.1-2 is not included in Table 2.4.5-5. The staff requests the applicant to include an ITAAC in section 2.4.5 to address this deficiency or justification for not including this ITAAC.

This question is also applicable to Tier 1, Sections 2.4.4 and 2.4.6.

14.03.03-11

In Tier 1, Section 2.7.5.1.1, the applicant stated that the Main Control Room HVAC system components are not designed or constructed to ASME Code Section III requirements and there is no ITAAC in Table 2.7.5.1-3 for components listed as ASME Code Section III. In Tier 2, Table 3.2-2 (Sheet 43 of 53), the Main Control Room air handling unit cooling coils were designated as ASME Codes Section III Class 3 because

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the entry is “3” in the “Code and Standards” column. The staff requests the applicant to provide appropriate ITAAC for the ASME Code Section III components or justification for not including any ITAAC for these components

The question is also applicable to some components in Sections 2.7.5.2-2, 2.7.5.2-3, 2.7.5.2-4, 2.7.5.2-5, 2.7.5.3.1.2, and 2.7.5.3.1.3

14.03.03-12

In Tier 1 Section 2.7.1.11, subsection Key Design Features, the applicant stated that the EFWS is capable of automatically initiating flow upon receipt of a system actuation signal. However, in Table 2.7.1.11-5, there is no ITAAC about verifying that the pump will start after receiving a signal. As an example, similar ITAAC is provided in Table 2.4.4-5. The staff requests the applicant to provide an ITAAC to verify that the pump will start after receiving a signal or justification for not including an ITAAC.

14.03.03-13

In Tier 1, Section 2.7.1.10, subsection Logic, the applicant stated that the containment isolation valves will close automatically upon receipt of a containment isolation signal. However, in Table 2.7.1.10-3, there is no ITAAC to verify that the SG Blowdown system provides containment isolation of the piping that penetrating the containment. As an example, similar ITAAC is provided in Table 2.4.4-5 Item 7a. The staff requests the applicant to provide an appropriate ITAAC to address the isolation of the system piping that penetrate the containment or justification for not including an ITAAC.

14.03.03-14

In Tier 1, Table 2.6.4-1, Item 7 Design Commitment, the applicant stated that the support systems for piping that is required to perform safety functions of starting and operating the Class 1E EPS are classified as ASME Code Section III. The staff questions whether simply confirming the classification of the support system is sufficient. For ASME Code Section III piping, there should be two separate ITAAC entries to encompass the as-built reconciliation and fabrication & installation. The staff requests the applicant to provide appropriate ITAAC in Table 2.6.4-1 for the ASME Code Section III piping or justification for not including an ITAAC.

14.03.03-15

In Tier 1 Table 2.7.4.2-1 Item 3, the applicant stated that the as-built ASME Code components of the Gaseous Waste Management System will conform to the requirements in the applicable ASME Code. It is not clear to the staff what the applicable ASME Code is. As an example, in Table 2.7.4.1-1, the applicant identifies it being ASME Code B31.3 as described by RG 1.143. The staff requests the applicant to identify the ASME Code in ITAAC Item 3 of Table 2.7.4.2-1.

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This question is also applicable to Section Table 2.7.4.3-1, Item 2.

14.03.03-16

In Tier 1 Section 2.7.6.8.1, subsection Seismic and ASME Code Classifications, the applicant stated that the seismic category and ASME code Section III requirements are applied to those isolation valves installed in the drainage piping from the engineered safety features (ESF) equipment room. The staff recognized that the isolation valves installed to provide isolation for the containment are addressed in Tier 1 Section 2.11.2. However, there is no ITAAC associated to these isolation valves installed in the drainage piping from ESF equipment room.

The applicant is requested to:

i) Provide appropriate ITAAC to address the design of this seismic category equipment or justification for not including an ITAAC.

ii) Provide appropriate ITAAC to address the as-built reconciliation of ASME Code Section III components or justification for not including an ITAAC.

iii) Identify any ASME Code Section III piping in the drainage piping from the ESF equipment room. If there is ASME Code Section III piping, appropriate ITAAC should also be included.
