

REQUEST FOR ADDITIONAL INFORMATION 676-5209 REVISION 0

12/21/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 03.08.03 - Concrete and Steel Internal Structures of Steel or Concrete Containments
Application Section: 3.8.3

QUESTIONS for Structural Engineering Branch 1 (AP1000/EPR Projects) (SEB1)

03.08.03-33

03.08.03-26

The staff has reviewed MHI's response to Question 03.08.03-21 (RAI No. 491-3733) and finds that the information presented to show the steps in the fabrication, shipment, and installation of the SC modules provides, overall, sufficient detail to satisfy the staff's request. However, MHI's response does not provide any information related to portion of the question which ask the applicant for information describing how voids, honey-combing, etc. will be minimized in the concrete that fills the interior of the prefabricated steel modules. MHI is requested to provide more information on the stated use of the tell-tale holes in the faceplates, such as size and spacing of these holes, and a discussion that shows this technique will effectively assures virtually total absence of voids or honeycombing in the concrete matrix.

03.08.03-34

03.08.03-27

MHI's response to Question 03.08.03-24 (RAI No. 491-3733) presents a clear and complete description of the planned steps necessary to achieve a sound contact between the final grout in the air space between the top of the last concrete pour and the bottom of the thick base plates at the lower end of the SC modules. By always having sufficient free air space around this grouting area assures that the number of voids in the grout will be minimal and that they will be small. Further, MHI shows that in areas away from the SC module footprints the 8 inch thick fill concrete will be placed before installation of the ¼ in. steel liner plates. The plates will then be placed onto steel structural shapes embedded in this fill concrete and welded.

The staff finds that this description provides a sound and practical approach to the achievement of the soundness of the grout under the SC module base plates. However, not addressed in the response is the nature and extent of QC inspection to be done on the welded joints in the thin, ¼ in. liner plates away from the SC modules. MHI is requested to provide this information.

03.08.03-35

03.08.03-28

The staff does not agree with MHI's statement related to Question 03.08.03-25(b) (RAI No. 491-3733) that not considering any cracked sectional stiffness leads to conservative

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member forces. Changes in the SC sectional stiffness can affect the seismic response and alter the values of the calculated member forces and moments in other structural members. MHI is requested to furnish numerical data supporting their position that ignoring cracked concrete in the SC modules is conservative with respect to determination of member forces and moments in other structural members.

The staff the staff finds MHI's commitment to develop appropriate stiffness reduction factors for each load combination to be an acceptable approach. However, since MHI will document these new calculations in a forthcoming Technical Report that was promised for April 2010, the staff reserves final acceptance of these approaches pending receipt and acceptance of the promised Technical Report.