

REQUEST FOR ADDITIONAL INFORMATION 403-3027 REVISION 0

6/18/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 11.02 - Liquid Waste Management System

Application Section: 11.2

QUESTIONS for Health Physics Branch (CHPB)

11.02-18

In response to the Staff's question (RAI 164-1925, Question 11.02-1) the US-APWR design was changed since Revision 1 to use a non-porous material (i.e., epoxy coating) for lining LWMS cubicles instead of stainless steel to meet the intent of 10 CFR 20.1406 and RG 4.21. Unlike stainless-steel liners, coatings are not approved by the NRC as a design feature for retention of liquids for compliance with 10 CFR 20.1302 and conformance with SRP 2.4.13 and 11.2.3, and BTP 11-6.

The response states that tanks in LWMS cubicles containing significant amounts of radioactive fluid are,

“lined with epoxy up to a wall height sufficient to contain the entire tank contents. This epoxy will serve as a barrier to minimize contamination of the facility, environment, and groundwater, from any leaks from the equipment.”

Coatings are also to be applied to all areas inside the A/B including the floor under pumps, and to decontaminable paints and smooth-surface coatings of concrete floors and walls.

Appendix A of RG 4.21 lists design features considered for compliance with 10 CFR 20.1406 such as impermeable, durable, and readily cleanable floor liners and catch basins (A-1, item e), material selection for SSCs such as liners for storage and transport of radioactive liquids (A-1, item s), appropriate sealers and a maintenance and inspection program for seal integrity over facility life (A-1, item t), and solidly constructed catch basins that are sealed, leak proof, and sufficiently larger capacity to hold entire tank contents (A-2, item c).

The Staff requests the Applicant to:

1. Justify the use of epoxy coatings as an acceptable liner for LWMS cubicles to minimize contamination of the environment and groundwater (i.e., justify the capability of epoxy coatings to retain liquids given that coatings are typically applied to protect the surfaces of facilities and equipment from corrosion and contamination, and because coatings are not approved for retention of liquids per BTP 11-6).

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2. Describe the maintenance and inspection program that will be implemented to ensure the integrity of epoxy coatings for sealing floor and wall surfaces to minimize contamination of the facility.

Revise the DCD to include this information and provide a markup in your response.

11.02-19

In response to the Staff's questions (RAI 164-1925, Question 11.02-2, item 2) to provide (or justify exclusion of) ITAAC to ensure complete and acceptable construction of stainless-steel liners for LWMS cubicles before the design change using epoxy coatings MHI states,

"With respect to the Initial Test Program for these coating systems, normal construction testing practices will be utilized with qualified coating inspections per the ASTM D4537-04a "Standard Guide for Establishing Procedures to Qualify and Certify Inspection Personnel for Coating Work in Nuclear Facilities". Hence, no ITAAC is necessary."

The Staff requests the Applicant to:

1. Identify the described ITP on coating systems, construction practices and qualified inspections for LWMS cubicles in the DCD, and provide a markup in your response.

11.02-20

In response to the Staff's question (RAI 164-1925, Question 11.02-6, item 1) to include in Section 11.2.3.2, the Tc-99 and I-129 concentrations in the tank failure analysis, or justify their exclusion in an evaluation which considers the environmental (fate and transport) characteristics of Tc-99, I-129, and Cs-137, MHI states that the contribution of Tc-99 and I-129 can be neglected because the same hydrological travel speed and time is used for Cs-137 which "conservatively neglects the adsorption effect by the soil."

In response to the Staff's question (RAI 164-1925, Question 11.02-6, item 2) to fully describe in Section 11.2.3, the approach used to demonstrate that liquid radioactive effluents processed by the LWMS released into the surface or groundwater from an assumed tank failure comply with the radionuclide concentrations in 10 CFR 20, Appendix B, Table 2, Column 2 (under the unity rule) and TEDE of 50 mrem/yr MHI states,

"the RATAF computer code for pressurized water reactors that is provided in NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants" is used for the evaluation."

In response to the Staff's question (RAI 164-1925, Question 11.02-6, item 2(d)) on the equipment malfunction analysis in Section 11.2 Table 11.2-18 (Sheets 1 and 2) MHI states,

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“It is not necessary to describe the event stated in Table 11.2-18 since the assumption in subsection 11.2.3.2 provides greater release impact than the events stated in Table 11.2-18.”

The Staff was not able to find a discussion of this table in Section 11.2 of the DCD.

The Staff requests the Applicant to:

1. Clarify what is meant by “conservatively neglects the adsorption effect by the soil” because a conservative approach taken in the tank failure analysis would assume no dilution by groundwater and no credit for retardation or suspension in subsurface media. Revise the DCD to include this information and provide a markup in your response.
2. Justify the use of RATAF (NUREG-0133) based on GALE (1975) for the failed tank evaluation which predates both the source term specification in PWR-GALE (NUREG-0017) used to calculate effluent releases in Section 11.2 and ANSI/ANS-N18.1-1999 used to develop source terms in Section 11.1.
3. Revise the DCD to include the information in the Applicant’s response (e.g., approach and methodology used to demonstrate compliance with the regulations and conformance with SRP 2.4.13 and 11.2.3 and BTP 11-6, tank inventories, etc.) and provide a markup in your response.
4. Submit the RATAF code input/output files used to calculate the failed tank inventories and concentrations.
5. Discuss the information presented in Table 11.2-18, which is absent from Section 11.2. Revise the DCD to include this information and provide a markup in your response.