REQUEST FOR ADDITIONAL INFORMATION 629-4973 REVISION 2

9/7/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 11.03 - Gaseous Waste Management System
Application Section: 11.3

QUESTIONS for Health Physics Branch (CHPB)

11.03-18

Staff review of DCD Tier 2, Section 11.3 and applicant responses to RAIs found some design details were not fully described and/or exhibited inconsistencies for compliance with 10 CFR Part 20, Appendix B, Table 2, Column 1; 10 CFR Part 50, Appendix I; 10 CFR 20.1301; 10 CFR.1302; 10 CFR 50.34a; 10 CFR 50.36a; 10 CFR 50, Appendix A; 10 CFR 50.9; and 40 CFR Part 190. In response to the following questions, please revise the DCD and provide a markup.

1. DCD Tier 2, Section 11.3.1.6, “Mobile or Temporary Equipment” was revised to state that the GWMS does not include the use of mobile or temporary equipment. However, DCD Tier 2, Section 14.3.7, “ITAAC for Plant Systems” describes ITAAC for verifying the performance of the gaseous waste management system (as permanently installed systems or in combination with mobile processing equipment). Please correct this apparent inconsistency.

2. Please submit for staff review the following calculation packages that support demonstration of compliance to the NRC regulations:
   a) MHI PWR-GALE code calculations of gaseous effluent releases (both normal and maximum releases) and comparisons to the ECLs in 10 CFR Part 20, Appendix B, Table 1, and the GASPAR II code calculations of gaseous effluent doses.
   b) MHI PWR-GALE code calculations of waste gas surge tank leak and charcoal bed analysis. In addition, DCD Tier 2, Section 11.3.3.2.1, “Waste gas surge tank leak” assumes a transfer (decay) time of 24 hours for the decay of noble gases in the reactor coolant after reactor shut down to evaluate the radiological consequence of the waste gas surge tank leak and satisfy the 300 μg Xe-133 dose equivalent TS limit. Please provide the basis for the 24 hours decay time.
3. DCD Tier 2, Revision 2, Section 11.3.4, “Ventilation System” describes a discharge isolation valve located downstream of the discharge radiation monitor which closes on a low ventilation system exhaust flow rate to minimize the potential for release of treated gaseous waste and the accumulation of hydrogen in the vent stack. DCD Tier 2, Section 11.3.2.1.4, “Hydrogen/Oxygen Analyzers” describes isolation of gas sources to the charcoal bed by closing this valve when a high-high alarm occurs. DCD Tier 2, Section 11.3.2, “System Description” describes the discharge valves as remaining open when the radiation setpoint is not exceeded and closure when there is a lack of ventilation flow in the vent stack. Further, DCD Tier 1, Section 2.7.4.2.1, “Design Description” verifies automatic closure of the GWMS effluent discharge valves in the ITAAC. The principal design criteria given in 10 CFR Part 50, Appendix

A establish the necessary design, fabrication, construction, testing, and performance requirements for SSCs important to safety that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public. Please describe the safety function of the GWMS isolation value in DCD Tier 2, Section 11.3 and identify its preoperational test in DCD Tier 2, Section 14.2.12.1.81. Please also address the same, as needed, for the LWMS dual isolation values installed on the sole discharge line to monitor and control liquid effluent releases to the environment in the corresponding DCD Tier 1 and 2 sections.

4. DCD Tier 2, Revision 2, Section 11.3.1.2 describes a design criterion on interconnections between the GWMS and other plant systems to preclude contamination of non-radioactive systems and minimize uncontrolled and unmonitored releases of radiation to the environment, but does not fully identify compliance with IE Bulletin 80-10 for the described GWMS design features. In the appropriate subsections to DCD Tier 2, Section 11.3, please identify compliance with IE Bulletin 80-10 as considered in the GWMS design. Please also address the same in DCD Tier 2, Sections 11.2, 11.4, and 11.5; and DCD Tier 2, Section 1.9.
5. Staff review of DCD Tier 2, Section 11.3 and Table 11.3-3, “Equipment Malfunction Analysis” and DCD Tier 2, Appendix 9A.3, “Fire Hazards Analysis Results” indicates that a fire hazards analysis for an external fire involving the charcoal delay beds in the GWMS located in the A/B is not evaluated. DCD Tier 2, Appendix 9A.3.129 FA4-101, “Auxiliary Building” describes the potential for a radioactive materials release resulting from a fire within the radwaste areas. Please evaluate whether a fire due to an external source causing charcoal in the delay beds to reach auto ignition temperatures would have offsite dose consequences and discuss the results of such analysis in DCD Tier 2, Section 11.3. Please also include charcoal as a potential combustible item in DCD Tier 2, Table 9A-2, “Fire Hazard Analysis Summary (Sheet 236 of 293)” or provide justification why it should not be included in this table.
6. DCD Tier 2, Sections 11.3.2, “System Description,” and 11.3.3.1, “Radioactive Effluent Releases and Dose Calculation in Normal Operation,” describe the vent stack and release point design information. In DCD Tier 2, Section 11.3.3.1, the detailed design information for the vent stack is to include the height of release, stack diameter, effluent temperature and flow rate, effluent exit velocity, and the size and shape of flow orifices. The vent stack runs alongside containment and is the only release point above the top of containment for the GWMS and HVAC systems associated with the R/B, A/B, and AC/B. DCD Tier 2, Figures 9.4.3-1, "Auxiliary Building HVAC System Flow Diagram" and 9.4.5-1, "Annulus Emergency Exhaust System Flow Diagram" do not show the presence of HEPA and carbon filtration in the A/B ventilation system for gaseous effluent discharges to the environment via the plant vent stack. Please justify the absence of such filtration in the A/B ventilation system.