

REQUEST FOR ADDITIONAL INFORMATION NO. 143-1737 REVISION 1

1/9/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 12.02 - Radiation Sources
Application Section: 12.02 - Radiation Sources

QUESTIONS for Health Physics Branch (CHPB)

12.02-10

10 CFR 20.1101(b), 1201 and 1202 require licensees to control internal and external occupational exposure, and to ensure that engineering controls are used to keep occupational doses ALARA. Regulatory Guide 8.8 notes that the applicant should estimate the quantity and isotopic composition of the radioactive material contained, deposited or accumulated in station equipment. The guidance contained in Regulatory Guide 1.206 sections C.I.12.2.1 "Contained Sources" C.I.12.2.2 "Airborne Radioactive Material Sources" notes that the applicant is to provide the models, assumptions and parameters used to calculate airborne radioactive material source magnitudes, including isotopic composition and the bases for all values. The applicant should describe, and identify sources by location and magnitude and then tabulate the calculated concentrations of airborne radioactive material by nuclides. This information should be provided for normal operation, AOO, and accident conditions for equipment cubicles, corridors, and operating areas normally occupied by operating personnel. Airborne activity concentration values reported in Section 12.2, and the bases for the values presented, appear to be incomplete or inconsistent with other sections.

Question 1:

The APWR DCD Table 12.2-60 "Parameters and Assumptions for Calculating Airborne Radioactive Concentrations" only provides a partial list of the parameters and assumptions needed to calculate the airborne concentrations depicted in Table 12.2-61 "Airborne Radioactive Concentrations", and similar tables. These parameters should include assumptions such as the frequency of use of low volume purge systems, removal rates due to internal recirculation/cooling systems, any plate out of material on internal plant surfaces, the time after leak initiation for the stated concentration values and initial density of the leaking fluid.

In accordance with RG 1.206, please revise DCD section 12.2 to provide a complete list of parameters and assumptions that are consistent with, and support the airborne activity concentrations reported in section 12.2.

12.02-11

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Question 2:

The APWR DCD Table 12.2-60 "Parameters and Assumptions for Calculating Airborne Radioactive Concentrations" provides an assumed leakage rate of 100 lb/d. This corresponds to a leakage rate of about 0.01 gpm. DCD Chapter 16 section 3.4.13 RCS Operational Leakage states that unidentified leakage shall be limited to less than 1 gpm and identified leakage to less than 10 gpm. The use of 100 lb/d of leakage for calculating occupational airborne exposure concentrations is not conservative with respect to the stated allowable leakage rates.

In accordance with RG 1.206, please provide in chapter 12.2 the models, parameters and assumptions that justify the use of 100 lb/d leakage rate for calculating airborne concentration values for the purpose of radiation protection, when the Technical Specification allowable leakage rates are 1 gpm for unidentified and 10 gpm for identified.