

# REQUEST FOR ADDITIONAL INFORMATION NO. 140-1732 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)

12.02-4

10 CFR 20.1101(b) requires licensees to ensure that engineering controls are used to keep occupational doses ALARA. The guidance contained in Regulatory Guide 1.206 section C.I.12.2.1 "Contained Sources" notes that the applicant is to provide the models, parameters and bases for all values used to calculate source magnitudes, for normal and accident conditions. The guidance contained in NUREG-0800 "Standard Review Plan 12.2" notes under the "Acceptance Criteria" that for PWRs designed for the recycling of tritiated water, tritium concentrations in contained sources and airborne concentrations should be based on a primary coolant concentration of 3.5  $\mu\text{Ci/gm}$ . Operational Experience from PWR plants that are using 2 year fuel cycles without recycling of RCS as Primary Make Up Water, indicate that RCS tritium activity is above 1  $\mu\text{Ci/gm}$  during portions of the operating cycle.

## Question 1:

10 CFR 20.1101(b) and 10 CFR 20.1701 require licensees to ensure that engineering controls are used to keep occupational doses ALARA. The guidance contained in Regulatory Guide 1.206 section C.I.12.2.1 and CI.12.2 notes that the applicant is to provide the models, parameters and bases used to calculate source magnitudes. The guidance contained in NUREG-0800 "Standard Review Plan 12.2" notes under the "Acceptance Criteria" that for PWRs designed for the recycling of tritiated water, tritium concentrations in contained sources and airborne concentrations should be based on a primary coolant concentration of 3.5  $\mu\text{Ci/gm}$ . Operational Experience from PWR plants that are using 2 year fuel cycles without recycling of RCS as Primary Make Up Water, indicate that RCS tritium activity is above 1  $\mu\text{Ci/gm}$  during portions of the operating cycle.

The APWR DCD Section 9.3.4.2.5 notes that distillate from boric acid evaporator is either transferred to the Primary Makeup Water Tank or released to the liquid waste management system (LWMS). In DCD Table 11.1-9 "Realistic Source Terms" the value used for RCS tritium activity is listed as 1  $\mu\text{Ci/g}$ . For the purposes of occupational radiation exposure control, the value provided in Table 11.1-9 is not conservative with respect to the guidance provided in Nureg-0800 Section 12.2, and observed Operational Experience.

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