REQUEST FOR ADDITIONAL INFORMATION 841-6055 REVISION 3

10/18/2011

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 03.04.01 - Internal Flood Protection for Onsite Equipment Failures
Application Section: 3.4.1 - Flood Protection

QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)

03.04.01-29

DCD Tier 2, Section 3.4.1.5, "Evaluation of Internal Flooding," outlines the flood evaluation process used in the internal flooding analysis for the US-APWR design. This section identifies the following flooding events that were considered in the analysis:

•Loss of Coolant Accident (LOCA)
•Earthquake
•High-Energy Line Break/Moderate Energy Line Break (HELB\MELB)
•Fire Fighting Operations

While the DCD states that the above events are considered, and identifies the events that were used in determination of the maximum flood height in the various plant areas subject to internal flooding, the DCD did not provide the basis for the assumption used in determining these applicable flood levels. An example would be flooding resulting from fire fighting operations in the reactor building. In the DCD, it is indicated that the quantity of flood water associated with fire-fighting activities is based on operation of two hose stations for two hours, assuming a 125 gpm flow rate per hose station. The basis for the assumption of two hose stations, and the assumption of a flowrate of 125 gpm per hose station for two hours is not provided in the DCD. Another example where the DCD has limited information is on the HELB/MELB evaluations. HELB/MELB is considered in the evaluation, and the HELB contribution to flood levels are shown in some areas but there is no indication on when breaks and cracks in moderate energy lines were considered, or how they were evaluated.

In order for the staff to evaluate if safety-related SSCs are adequately protected form internal flooding, as required by GDCs 2 and 4, the applicant is requested to provide following information:

1. Provide, and include in the DCD, the basis for assumptions made for evaluating flooding due to fire fighting operations, including the bases for the number of hose stations assumed, the flow rates for those stations for all areas where fire fighting operations were assumed, and the 2 hour duration.

2. Discuss how high and moderate energy line breaks and cracks were accounted for in their analsysis. Include information on which breaks were accounted for in each area, and how the release rates and durations were determined for the high and moderate energy line failures.

Additionally, the flooding analysis should be made available for NRC audit.

03.04.01-30

DCD Tier 2, Section 3.4.1.5.2.2 states in part that "the MCR, subject to regular access, is protected from flooding by use of barriers." The staff reviewed DCD drawings (Tier 1 Figure 2.2-18, and Tier 2 Figure 3K-5) that provides the location of watertight doors and flood barrier walls located on elevation 25'-3 of the reactor building, and was unable to find the barriers referred to in DCD Tier 2, Section 3.4.1.5.2.2.

The staff requests the applicant to update DCD Tier 1, Figure 2.2-18 and Tier 2, Figure 3K-5 to clearly identify the location of the flood barriers referred to in DCD Tier 2, Section 3.4.1.5.2.2.