

REQUEST FOR ADDITIONAL INFORMATION 652-5194 REVISION 0

11/1/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 06.02.02 - Containment Heat Removal Systems

Application Section: 6.2.2 and 6.3

QUESTIONS for Containment and Ventilation Branch 1 (AP1000/EPR Projects) (SPCV)

06.02.02-62

Containment accident pressure is the pressure in containment during a postulated accident. RG 1.82 states that pump performance should be independent of the calculated increases in containment pressure caused by postulated LOCAs and also states that sufficient available NPSH should be provided to system pumps assuming no increase in containment pressure from that present prior to the postulated LOCA. SRP 6.2.2 states that if "containment accident pressure is credited in determining available NPSH, an evaluation of the contribution to plant risk from inadequate containment pressure should be made." The US APWR design uses containment accident pressure in evaluating the net positive suction head (NPSH) for pumps that perform emergency core cooling and containment heat removal functions. Please perform a risk assessment and provide the results, along with a summary description of the methods used and assumptions made, to the staff for review. The risk assessment should address all plant accident conditions where CAP is credited for reliable operation of the ECCS and containment heat removal system pumps and discuss the bases (e.g., results of thermal-hydraulic analyses) for determining whether CAP credit is needed. All accident initiating events (internal and external) and modes of operation modeled in the US APWR design-specific PRA must be addressed in assessing the risk associated with CAP credit. Qualitative arguments can be used to demonstrate that the risk associated with certain initiating events or accident sequences is insignificant or smaller than the risk associated with analyzed cases, as applicable. In particular, the risk analysis and its documentation should address the following items, as applicable:

- 1) Method, assumptions, and results for each LOCA initiating event category.
- 2) Method, assumptions, and results for non-LOCA accident initiating event categories which include feed-and-bleed operation, stuck-open safety valves, or any other means of providing heat to the in-containment refueling water storage tank.
- 3) Investigate any potential adverse interaction among the operator actions credited in the PRA for accident mitigation and the need to prevent human actions that could lead to inadvertent opening of the containment isolation valves or to containment depressurization.
- 4) Investigate the risk impact of operating emergency core cooling and containment heat removal systems with impaired containment integrity (e.g., undetected pre-existing containment opening) or operation of containment heat removal systems at too high a rate.

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In addition, describe the monitoring program that demonstrates that the actual performance of plant equipment is consistent with the performance assumed in the engineering and probabilistic analyses used to justify CAP in determining NPSH available.