

# REQUEST FOR ADDITIONAL INFORMATION NO. 152-1642 REVISION 0

1/12/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 03.05.01.02 - Internally Generated Missiles (Inside Containment)  
Application Section: 3.5.1.2 - Internally Generated Missiles (Inside Containment)

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

03.05.01.02-1

## **RAI 3.5.1.2-01**

In Section 3.5.1.2.2.1 of the US-APWR DCD Tier 2, Revision 1, Mitsubishi refers to Section 3.5.1.1 for discussion of its rationale to exclude certain types of equipment from consideration as credible missile sources inside the containment. For example, missiles originating valves, threaded connections and piping in high energy systems would not be credible due to ASME code criteria that control quality from production through operation, material characteristics, and in-service inspections. Qualitative discussions are also used to exclude other types of equipment (e.g. Components including missiles originating from the reactor vessel, steam generator, reactor coolant pump pressurizer, valves and piping, within the reactor coolant pressure boundary gravitational missiles such as falling objects resulting from non-seismic SSCs during a seismic event, secondary missiles, and unsecured maintenance equipment) from consideration as credible missile sources. However, Mitsubishi has not provided the analysis to demonstrate that these missiles are of insufficient energy to cause unacceptable impact or to cause unacceptable damage. Also, it is not clear to the staff whether Mitsubishi has followed the guidance described in SRP 3.5.1.2 for probabilistic analyses to determine which missiles may be non-credible by demonstrating that the event is not statistically significant if the product of the probability of missile occurrence, probability of impact on a significant target, and probability of significant damage is less than  $1 \times 10^{-7}$  per year.

Where the Tier 2 DCD has excluded equipment items from consideration as credible missile sources based on design features and other qualitative considerations, demonstrate how these design features and qualitative considerations would ensure a level of protection from missiles that is equivalent to the probability criteria described in SRP 3.5.1.2, Section II, "SRP Acceptance Criteria," Item 1. Include this information in the DCD and provide a markup in your response.

## **RAI 3.5.1.2-02**

In US-APWR DCD Tier 2, Revision 1 Section 3.5.1.2.2.3, Mitsubishi describes two credible sources (items containing high-energy fluids and high-speed rotating equipment) of internally generated missiles inside containment. Items containing high-energy fluids are dismissed as a credible source of an internally generated missile, given

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that all high-energy systems within the prestressed concrete containment vessel (PCCV) comply with ASME Code, Section III. Reference is made to a few non safety-related, high-speed rotating equipment items that remain as credible sources of internally-generated missiles inside containment. However, information provided in the US-APWR DCD Tier 2, Revision 1 does not provide a specific listing of the non safety-related, high-speed rotating equipments items located inside containment that may be the source of credible missiles, or potential damage to or failure of SSCs important to safety as a result of missile impingement. Further, the US-APWR DCD Tier 2, Revision 1 does not describe the specific missile protection capability employed for each of these potential missiles. This information is needed so the staff can complete the review activities described in Section III, Item 2 of Standard Review Plan (SRP) 3.5.1.2.

Therefore, for the non safety-related, high-speed rotating equipment items that remain as credible sources of internally-generated missiles, provide the following information:

- the specific equipment items that represent sources for credible missiles,
- potential damage to or failure of SSCs important to safety as a result of missile impingement, and
- missile protection capability.

Include this information in the DCD and provide a markup in your response.

### **RAI 3.5.1.2-03**

10 CFR 52.47(b) (1) requires that a DC application contain the proposed inspections, tests, analyses, and acceptance criteria (ITAAC) that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a plant that incorporates the design certification is built and will operate in accordance with the design certification, the provisions of the Atomic Energy Act, and the NRC's regulations.

In US-APWR DCD Tier 2, Revision 1, Section 3.5.1.2, Mitsubishi refers to Section 3.5.1.1 for discussion of its approach to identify potential missiles, determine the statistical significance of potential missiles, and provide measures for SSCs requiring protection against the effects of missiles inside containment. However, DCD Tier 1 Chapter 2.0, "Design Descriptions and ITAAC," does not contain an ITAAC to verify that SSCs inside containment are designed and constructed in accordance with the requirements as described in DCD Tier 2 Section 3.5.1.2 to prevent or mitigate the effects of internally generated missiles inside containment.

Therefore, provide an ITAAC that requires COL applicant to perform a walk-down of the SSCs to ensure that SSCs described in the above cited section are protected from internally generated missiles (inside containment) in accordance with the requirements as described in DCD Tier 2 Section 3.5.1.2. Include this information in the DCD and provide a markup in your response.