

REQUEST FOR ADDITIONAL INFORMATION 802-5931 REVISION 3

8/10/2011

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 03.09.01 - Special Topics for Mechanical Components

Application Section: 3.9.1

QUESTIONS for Engineering Mechanics Branch 1 (AP1000/EPR Projects) (EMB1)

03.09.01-7

This question is a follow-up to question 03.09.01-1, Item 6, RAI 296-2254.

In RAI 3.9.1-1, Item 6, the applicant was asked about DCD section 3.9.1.1.1.10 which addresses the core lifetime extension transient. SRP 3.9.1 section III.1 states that any deviation from previous accepted practice be justified. The use of a decreased RCS average temperature with turbine inlet valve adjustments to extend the life of the core is a new transient that has not previously been approved. The applicant was asked to provide additional information and justification for this transient including impacts on core design and performance.

In a May 14, 2009, response to RAI 3.9.1-1, Item 6 (Accession Number ML091380159), the applicant clarified for this transient, that they assume two weeks as a maximum core lifetime extension. The applicant also stated that the required temperature decrease to achieve criticality is conservatively determined by the analysis. The applicant clarified that the US-APWR is not performing core lifetime extension evaluations at this time. The applicant indicated that such evaluations will be performed in the future by the respective licensees as part of the license renewal process in accordance with 10 CFR Part 54. The applicant clarified that this event is included among the US-APWR design transients to confirm that the stress evaluation is acceptable when core lifetime extension evaluations are conducted in the future.

The staff finds that the applicant's response to RAI 3.9.1-1, Item 6 is incomplete and a portion of the applicants' response does not appear to be consistent with the description in Section 3.9.1.1.1.10 of the DCD. For instance, the DCD indicates that the Core Lifetime Extension transient is assumed to occur at the end of an operating cycle and is assumed to occur 60 times during the plant design lifetime; not at some future time. The following is requested:

1. Provide clarification on how a future effort to extend the life of the plant under the license renewal process is related to this Core Lifetime Extension transient.
2. If there is no direct connection, explain why the inclusion of this transient is required to provide acceptable stress for the future core lifetime extension.
3. Confirm whether the core-reload analyses for each cycle address a core lifetime extension transient as described in the DCD. As a follow-up to RAI 3.9.1-1, Item 6, provide a detailed discussion regarding the impacts of this transient on core design and performance.

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4. Provide clarification on any safety concerns or operational concerns with operating outside of the normal programmed RCS average temperature band for two weeks during this transient.