

KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Thursday, June 18, 2015 11:05 AM
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Cc: Li, Yueh-Li; Clark, Theresa; Betancourt, Luis; Lee, Samuel
Subject: APR1400 Design Certification Application RAI 41-7957 (03.06.02 - Determination of Rupture Locations and Dynamic Effects Associated with the Postulated Rupture of Piping)
Attachments: APR1400 DC RAI 41 MEB 7957.pdf; image001.jpg

KHNP

The attachment contains the subject request for additional information (RAI). This RAI was sent to you in draft form. Your licensing review schedule assumes technically correct and complete responses within 30 days of receipt of RAIs. However, KHNP requests and we grant a due date of 12/31/15. We may adjust the schedule accordingly.

Please submit your RAI response to the NRC Document Control Desk.

Thank you,

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REQUEST FOR ADDITIONAL INFORMATION 41-7957

Issue Date: 06/18/2015

Application Title: APR1400 Design Certification Review – 52-046

Operating Company: Korea Hydro & Nuclear Power Co. Ltd.

Docket No. 52-046

Review Section: 03.06.02 - Determination of Rupture Locations and Dynamic Effects Associated with the Postulated Rupture of Piping

Application Section: DCD Tier2 Section 3.6.2

QUESTIONS

03.06.02-1

DCD Tier 2 Subsection 14.3.2.3 states that the scope of the graded approach for Class 2 and 3 piping includes main steam and main feed water piping located inside containment. However, it should be noted that in order to enable technically justified decoupling of postulated pipe break effects in completing analyses to demonstrate compliance with GDC 4, the analyses for main steam and main feedwater lines should extend to the first anchor beyond the outboard isolation valve that designates a Class break. At a public meeting on April 14-15, 2015, the applicant indicated that the analyses would in fact be extended to this location. Therefore, the applicant should revise the DCD discussion for consistency with its previous presentation, or justify the exclusion of this portion of main steam and main feedwater lines from the graded approach.

03.06.02-2

DCD Tier 2, Sections 3.6.2 and 3.12 provide the design methodology for piping analysis and pipe rupture analysis. DCD Tier 2, Subsection 3.6.2.1.1 provides an outline of the pipe rupture analysis report. DCD Tier 2, Subsection 14.3.2.3, "ITAAC for Piping Systems and Components," describes the use of a graded approach in completing APR1400 piping analysis and pipe rupture hazards analyses at the design certification stage. It identifies the scope of the graded approach including ASME Class 1 piping (RCS main loop, pressurizer surge line, direct vessel injection line, and shutdown cooling line and Class 2 and 3 piping systems (main steam (MS) and main feedwater (FW) piping located inside containment).

The concept of employing a graded approach for the piping analysis and pipe rupture hazards analysis for the design certification application is consistent with SECY-90-377, "Requirements for Design Certification under 10 CFR Part 52." The level of detail of the piping design (including the pipe rupture analysis) review is to be commensurate with the importance of the safety function to be performed. The staff will evaluate information provided in the design certification application (e.g., summary information on the analysis approach and results as well as methodology) to ensure that it is sufficient to support a final safety determination and meet the applicable requirements of 10 CFR 52.47. If sufficient design information is provided, a design could be certified without the need for design acceptance criteria.

DCD Tier 2, Section 3.6.2, Revision 0, primarily addresses the methodology for pipe rupture hazards analysis. To support the safety determination described above, the DCD should be revised to include additional information on the approach to and results of analyses completed at the design certification stage. This information should include:

- a) Summary information on the analysis approach for the pipe rupture analysis (e.g., referencing DCD Tier 2 Subsection 14.3.2.3 for the selection of certain piping systems based on graded approach)
- b) A summary of pipe rupture analysis results including:
 - i) A reference to the detailed pipe rupture analysis report(s) as described DCD Tier 2 Section 3.6.2.1.1
 - ii) The general location (e.g., piping system, room, or space) of the postulated pipe ruptures
 - iii) Characterization of postulated breaks as longitudinal or circumferential breaks
 - iv) The basis for postulating each break (e.g., terminal end or intermediate breaks resulting from the stress analysis according to BTP 3-4)
 - v) The essential systems which are subjected to the dynamic effects of each postulated pipe break and their associated protective devices (e.g., structural barriers, pipe whip restraints, jet impingement shields)

