

KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Wednesday, June 17, 2015 10:37 AM
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Cc: Tsirigotis, Alexander; Clark, Theresa; Betancourt, Luis; Lee, Samuel
Subject: APR1400 Design Certification Application RAI 35-7955 (03.12 - ASME Code Class 1, 2, and 3 Piping Systems and Piping Components and Their Associated Supports)
Attachments: APR1400 DC RAI 35 MEB 7955.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 90 days to respond to the RAI. 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 35-7955

Issue Date: 06/17/2015

Application Title: APR1400 Design Certification Review – 52-046

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

Docket No. 52-046

Review Section: 03.12 - ASME Code Class 1, 2, and 3 Piping Systems and Piping Components and
Their Associated Supports

Application Section: DCD Tier 2 Section 3.12

QUESTIONS

03.12-1

DCD Tier 2, Subsection 14.3.2.3, "ITAAC for Piping Systems and Components," identifies that the scope in the graded approach includes the piping design and analysis of MS and FW piping located inside containment. However, during the public meeting in April 2015 the applicant committed to include in the design and analysis of MS and FW the piping up to the 6 way rigid restraint beyond the outboard isolation valve (see slide 11 in applicant's slide presentation, available in the Agencywide Documents Access and Management System (ADAMS) via Accession No. ML15117A678). The applicant is requested to clarify whether the restraint beyond the outboard isolation valve(s), discussed above, is a 6-way rigid restraint or a 5-way rigid restraint and, in addition, revise its DCD in accordance with this commitment.

03.12-2

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

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52.47. If sufficient design information is provided, a design could be certified without the need for design acceptance criteria.

Specific to DCD Tier 2, Section 3.12, the following information is necessary to support the staff's safety determination.

A: To demonstrate that the piping, which has been structurally evaluated based on the graded approach described in DCD Tier 2, Section 14.3.2.3, conforms to the requirements of ASME *Boiler and Pressure Vessel Code* (BPV Code) Section III, mandated by 10 CFR 50.55a, provide the following information in response to this request. The information need not be included in the DCD unless the applicant chooses to do so.

1. A tabulated, quantitative summary of the calculated maximum stresses and fatigue usage factors (if applicable) with a comparison to ASME BPV Code allowable stress values for each code equation. Include only maximum stresses and data at critical locations, including anchors, flued head anchor penetrations, nozzles, penetrations, flanged connections, valve and relief valve connections, branching pipe connections and pipe supports. List all applicable loads in load combination cases for each service level and code equation.
2. For equipment nozzles, a tabulated quantitative summary of the calculated reaction loads compared to specific nozzle allowable values.
3. For containment penetrations, quantitative maximum calculated results compared to allowable values from the penetration structural qualifications which include loads from both sides of the penetration.

B: DCD Tier 2, Section 3.12, Revision 0, primarily addresses the methodology for piping analysis. To support the safety determination described above, DCD Section 3.12 should be revised to include additional information on the approach to the analyses and results of analyses completed at the design certification stage. This information should include:

1. Summary information on the piping analysis approach referencing DCD Tier 2 Subsection 14.3.2.3, for the selection of certain piping systems based on graded approach
2. A list of all ASME Class 1 piping that is not included in the scope for piping design and analysis discussed in DCD Subsection 14.3.2.3, with a justification for the exclusion that addresses the safety significance of these piping systems
3. A subsection in DCD Tier 2, Section 3.12 to discuss the results of the piping structural analyses performed, and a conclusion discussion that demonstrates that these results support the

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applicant's conclusion that safety-related APR1400 piping and their supports comply with the requirements of pertinent regulations (10 CFR 50.55a; 10 CFR Part 50, Appendix A, GDC-1, GDC-2, GDC-4, GDC-14, and GDC-15; and 10 CFR Part 50, Appendix S)

4. A reference to detailed analysis reports that are available for audit by the NRC staff.

