KHNPDCDRAIsPEm Resource

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Sent: Friday, July 07, 2017 4:56 PM
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Cc: McCoppin, Michael; Lupold, Timothy; Terry, Tomeka; Tsirigotis, Alexander; Ward, William
Subject: APR1400 Design Certification Application RAI 549-8856 [3.12 - ASME Code Class 1, 2, and 3 Piping Systems and Piping Components....]
Attachments: APR1400 DC RAI 549 MEB 8856.pdf

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.

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

Thank you,

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REQUEST FOR ADDITIONAL INFORMATION 549-8856

Issue Date: 07/07/2017
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 TheirAssociated Supports
Application Section: 3.12

QUESTION

03.12-19

ASME BPV Section III, mandated by 10 CFR 50.55a, requires that the structural evaluation of systems, structures, and components important to safety consider combinations of various loadings, including dead weight (DWT), pressure, seismic, thermal expansion and transient loads from system operating transients. Topical Report APR1400-Z-M-TR-12003-P-A (ML17129A596), “Fluidic Device Design for the APR1400” and technical report APR1400-K-A-NR-14005-P Rev.0 (ML14164A170), “CFD Analysis of Fluidic Device” both discuss the operation and the performance of the safety injection tank fluidic device (SIT-FD). The computational fluid dynamics (CFD) modeling, using full scale experimental data, showed that vaporous cavitation can occur in the center of the exit nozzle and the discharge tube for both large and small flow modes.

a) The staff would like to understand whether and how cavitation effects and vibration originating from the operation of the SIT and its FD have been taken in to account in the structural design evaluation of the SIT, its discharge piping and pipe supports.

b) Also please discuss whether the operation of the SIT with its FD can result in other phenomena, such as water hammer, and how their effects have been accounted for in the structural design of SIT, FD, piping and supports.

c) In addition, please discuss whether the structural evaluation model of the SIT is coupled with the FD. If decoupled, please discuss how consideration for protection against resonance has been accounted for.