KHNPDCDRAIsPEm Resource

From:	Ciocco, Jeff
Sent:	Monday, March 07, 2016 8:06 AM
To:	apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Andy Jiyong Oh; Christopher Tyree
Cc:	Gilmer, James; Karas, Rebecca; McKirgan, John; Steckel, James; Lee, Samuel; Williams, Donna
Subject:	APR1400 Design Certification Application RAI 430-8455 (15.06.05 - Loss of Coolant Accidents Resulting From Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary)
Attachments:	APR1400 DC RAI 430 SRSB 8455.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. However, KHNP requests, and we grant, 45 days to respond to the RAI questions. We may adjust the schedule accordingly.

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

Thank you,

Jeff Ciocco
New Nuclear Reactor Licensing
301.415.6391
jeff.ciocco@nrc.gov

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Hearing Identifier: KHNP_APR1400_DCD_RAI_Public
Email Number: 479

Mail Envelope Properties (b1ec590b4372425cbdd108bda6945b6e)

Subject: APR1400 Design Certification Application RAI 430-8455 (15.06.05 - Loss of Coolant Accidents Resulting From Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary)
Sent Date: 3/7/2016 8:06:13 AM
Received Date: 3/7/2016 8:06:14 AM
From: Ciocco, Jeff

Created By: Jeff.Ciocco@nrc.gov

Recipients:
"Gilmer, James" <James.Gilmer@nrc.gov>
Tracking Status: None
"Karas, Rebecca" <Rebecca.Karas@nrc.gov>
Tracking Status: None
"McKirgan, John" <John.McKirgan@nrc.gov>
Tracking Status: None
"Steckel, James" <James.Steckel@nrc.gov>
Tracking Status: None
"Lee, Samuel" <Samuel.Lee@nrc.gov>
Tracking Status: None
"Williams, Donna" <Donna.Williams@nrc.gov>
Tracking Status: None
"apr1400rai@khnp.co.kr" <apr1400rai@khnp.co.kr>
Tracking Status: None
"KHNPDCDRAIsPEm Resource" <KHNPDCDRAIsPEm.Resource@nrc.gov>
Tracking Status: None
"Andy Jiyong Oh" <jiyong.oh5@gmail.com>
Tracking Status: None
"Christopher Tyree" <Christopher.tyree@aecom.com>
Tracking Status: None

Post Office: HQPWMSMRS07.nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	617	3/7/2016 8:06:14 AM
APR1400 DC RAI 430 SRSB 8455.pdf	103721	
image001.jpg	5040	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

REQUEST FOR ADDITIONAL INFORMATION 430-8455

Issue Date: 03/07/2016
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 15.06.05 - Loss of Coolant Accidents Resulting From Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary
Application Section: 15.6.5.2 and 15.6.5.3

QUESTIONS

15.06.05-22

REGULATORY BASIS

Title 10 of the Code of Federal Regulations, Part 50, Appendix A, General Design Criterion (GDC) 28—*Reactivity limits* requires that the reactivity control systems shall be designed with appropriate limits on the potential amount and rate of reactivity increase to assure that the effects of postulated reactivity accidents can neither (1) result in damage to the reactor coolant pressure boundary greater than limited local yielding nor (2) sufficiently disturb the core, its support structures or other reactor pressure vessel internals to impair significantly the capability to cool the core. These postulated reactivity accidents shall include consideration of rod ejection (unless prevented by positive means), rod dropout, steam line rupture, changes in reactor coolant temperature and pressure, and **cold water addition**.

DESCRIPTION OF ISSUE

Generic Safety Issue (GSI) 185 (Control of Recriticality Following SBLOCAs) concerns the potential return to criticality following a small break LOCA due to insertion of unborated water in the core as a result of restoration of natural circulation or restart of a reactor coolant pump. The unborated water results from condensed steam from the steam generator tubes collecting in the loopseal piping. As noted in DCD, Tier 2 Table 15.0-12, GSI-185 was resolved, and consequently, no analysis was performed for the APR1400.

The basis for closure was an analysis performed for an operating B&W plant which was determined to be bounding for Westinghouse and C-E plants (including the System 80+) due to unique B&W plant loopseal arrangement relative to the core.

REQUEST

Because of the higher reactor power of the APR1400 compared with the System 80+ and larger heat transfer surface area, as well as differences in loopseal volume, the staff cannot make the same qualitative conclusion for the APR1400 without an analysis. Therefore, demonstrate by analysis that a return to criticality cannot occur following a SBLOCA.

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment