

KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Monday, August 01, 2016 3:25 PM
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Cc: Schmidt, Jeffrey; Karas, Rebecca; Steckel, James; Williams, Donna
Subject: APR1400 Design Certification Application RAI 511-8668 (15.04.06 - Inadvertent Decrease in Boron Concentration in the Reactor Coolant (PWR))
Attachments: APR1400 DC RAI 511 SRSB 8668.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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Hearing Identifier: KHNP_APR1400_DCD_RAI_Public
Email Number: 569

Mail Envelope Properties (bf9e6a1d4cb04a159332f955f97dd6b1)

Subject: APR1400 Design Certification Application RAI 511-8668 (15.04.06 - Inadvertent Decrease in Boron Concentration in the Reactor Coolant (PWR))
Sent Date: 8/1/2016 3:24:41 PM
Received Date: 8/1/2016 3:24:43 PM
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Files	Size	Date & Time
MESSAGE	498	8/1/2016 3:24:43 PM
APR1400 DC RAI 511 SRSB 8668.pdf		86383
image001.jpg	5040	

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REQUEST FOR ADDITIONAL INFORMATION 511-8668

Issue Date: 08/01/2016

Application Title: APR1400 Design Certification Review – 52-046

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

Docket No. 52-046

Review Section: 15.04.06 - Inadvertent Decrease in Boron Concentration in the Reactor Coolant (PWR)

Application Section:

QUESTIONS

15.04.06-8

10 CFR Part 50 Appendix A, GDC 10 requires that the reactor core and associated coolant, control and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences. The inadvertent reactor coolant system (RCS) boron dilution event is classified as anticipated operational occurrence per Standard Review Plan (SRP) 15.4.6. SRP 15.4.6 states the minimum departure from nucleate boiling ratio (DNBR) should be above the safety analysis DNBR limit for at power operations.

In response to RAI 8221, Question 15.4.6-5, the applicant stated that the reactivity insertion rate due to an at power boron dilution event is bounded by the control element assembly (CEA) withdrawal analyses of DCD Sections 15.4.1 and 15.4.2. The staff notes that the CEA withdrawal analyses do not violate the minimum DNBR limit as the variable overpower trip occurs limiting the power excursion. It is unclear to the staff that a slow reactivity insertion transient such as a boron dilution at power would be protected by the variable overpower trip. Therefore, please describe and update DCD section 15.4.6 with the reactor trip that would occur for an at power boron dilution event, and the technical basis why that reactor trip would prevent violating the minimum DNBR.

