KHNPDCDRAIsPEm Resource

From:	Ciocco, Jeff
Sent:	Wednesday, February 17, 2016 10:25 AM
To:	apr1400rai@khnp.co.kr; Joongho Kim (jhokim082@gmail.com); Andy Jiyong Oh; James Ross; KHNPDCDRAIsPEm Resource
Cc:	Chien, Nan; Segala, John; Steckel, James; Lee, Samuel
Subject:	APR1400 Design Certification Application RAI 406-8427 (19.03 Beyond Design Basis External Event (APR1400))
Attachments:	APR1400 DC RAI 406 SCVB 8427.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: 457

Mail Envelope Properties (40d5f8590bfe4a39b10203edf4de9079)

Subject: APR1400 Design Certification Application RAI 406-8427 (19.03 Beyond Design Basis External Event (APR1400))
Sent Date: 2/17/2016 10:25:25 AM
Received Date: 2/17/2016 10:25:26 AM
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Post Office: HQPWMSMRS07.nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	498	2/17/2016 10:25:26 AM
APR1400 DC RAI 406 SCVB 8427.pdf	99959	
image001.jpg	5040	

Options
Priority: Standard
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Recipients Received:

REQUEST FOR ADDITIONAL INFORMATION 406-8427

Issue Date: 02/17/2016
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 19.03 Beyond Design Basis External Event (APR1400)
Application Section:

QUESTIONS

19.03 Beyond Design Basis External Event (APR1400)-24

NRC Commission paper SECY-12-0025 (February 17, 2012), "Proposed Orders and Requests for Information in Response to Lessons Learned from Japan's March 11, 2011, Great Tohoku Earthquake and Tsunami," stated that the NRC staff expected new reactor design certification or license applications (e.g., construction permit, operating license, and combined license) not yet then-submitted to address the Commission-approved Fukushima actions in their applications, prior to submittal, to the fullest extent practicable. In SECY-12-0025, the NRC staff outlined a three-phase approach regarding mitigation strategies to respond to beyond-design-basis external events (BDBEEs). The initial phase involved the use of installed equipment and resources to maintain or restore core cooling, containment, and spent fuel pool (SFP) cooling without alternating current power. The transition phase involved providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase involved obtaining sufficient offsite resources to sustain those functions indefinitely.

The NRC staff provided guidance for satisfying the Commission directives regarding BDBEE mitigation strategies in Japan Lesson-Learned Project Directorate (JLD)-ISG-2012-01, Revision 0, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," (ADAMS Accession No. ML12229A174). JLD-ISG-2012-01 endorsed with clarification the methodologies described in the industry guidance document Nuclear Energy Institute (NEI) 12–06, Revision 0, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," (ADAMS Accession No. ML12242A378). The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

NEI 12-06 Revision 0, Section 3.2.1.8 "Effects of Loss of Ventilations," states that "The effects of loss of HVAC in an extended loss of ac power event can be addressed consistent with NUMARC 87-00 [Ref. 8] or by plant-specific thermal hydraulic calculations, e.g., GOTHIC calculations." In Technical Report APR1400-E-P-NR-14005-P Table 5-9 "Conformance with NEI 12-06, Rev. 0," the applicant states that the APR1400 FLEX strategy complies with NEI 12-06, Section 3.2.1.8.

APR1400-E-P-NR-14005-P, Section 5.1.2.3.1.1.2, "Phase 1-b (1 to 8 hours)," states that during phase 1 of full-power operation, up to 8 hours, additional cooling in MCR, electrical and I&C equipment rooms, TDAFWP rooms is not required based on heat-up calculations. Also, APR1400-E-P-NR-14005-P, Section 5.1.2.3.1.2.1, "Basic Operational Strategy," states that during phase 2 of full-power operation, 8 to 72 hours, additional cooling in MCR, electrical and I&C equipment rooms, TDAFWP rooms, and ACP room is not required based on heat-up calculations. Additionally Table 5-7, "APR1400 Flex Capability Summary," discusses HVAC as a support function and states that "no cooling is necessary for MCR, electrical and I&C

equipment room, ACP room and the TDAFWP room as the heatup temperature does not exceed the design temperature of the room during BDBEE."

This RAI is to request clarification on the acceptance criteria used to assess the effects of a loss of heating, ventilation, and air conditioning to satisfy equipment functionality, control room operator habitability, and personnel accessibility. As part of the response, discuss if opening doors to an affected cabinet or area (e.g., pump room) is included as part of the strategy to ensure that equipment failure does not occur as a result of a loss of forced ventilation/cooling or that an area is habitable or accessible for required operator actions.


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