

## **KHNPDCDRAIsPEm Resource**

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**Sent:** Friday, August 19, 2016 6:01 PM  
**To:** apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; daegeun.ahn@gmail.com; Andy Jiyong Oh; Jungho Kim (jhokim082@gmail.com); Ross, James  
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**Subject:** APR1400 Design Certification Application RAI 516-8646 [19.3 - Beyond Design Basis External Event (APR1400)]  
**Attachments:** APR1400 DC RAI 516 SCVB 8646.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,

**William R. Ward, P.E.**  
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## REQUEST FOR ADDITIONAL INFORMATION 516-8646

Issue Date: 08/19/2016  
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)-40**

The NRC staff provided guidance for satisfying the Commission directives regarding Beyond Design Basis External Events (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." 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." The guidance in JLD-ISG-2012-01 describes one acceptable approach for satisfying the Commission directives regarding BDBEE mitigation strategies.

According to DCD Section 19.3.2.3, "Recommendations 4.1 and 4.2 – Station Blackout and Mitigation Strategies for Beyond Design Basis External Events", NEI 12-06 was considered in developing the APR1400 FLEX strategy. NEI 12-06 states that the effects of loss of heating, ventilation, and air conditioning (HVAC) in an extended loss of ac power event can be addressed consistent with NUMARC 87-00, "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors."

The response to RAI 406-8427, dated March 15, 2016 (ADAMS accession no. ML16075A418), states that the acceptance criteria for the APR1400 are set with reference to NUMARC 87-00, Rev 1. It also states that the maximum allowable temperature for the main control room (MCR) and technical support center (TSC), 110 °F, follows the habitability requirement specified in NUMARC 87-00. NUMARC 87-00 Rev. 1, refers to habitability conditions in ASHRAE Handbook (1985) which correlates temperature, humidity, and pressure and concludes that light work above 110 °F and relative humidity above 50% would be intolerable.

The present APR1400 calculation, "Room Heatup Calculation for Main Control Room, 1-601-M370-001, Rev. 1", reviewed in response to RAI 406-8427, shows that the maximum temperature of the MCR and TSC is below 110 °F however the RAI response and calculation do not demonstrate consideration of relative humidity. Therefore, as a follow-up RAI, the applicant is requested to justify how the relative humidity component of ASHRAE 1985 is satisfied in concert with the temperature requirement.