

## **KHNPDCDRAIsPEm Resource**

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**From:** Ciocco, Jeff  
**Sent:** Tuesday, October 20, 2015 2:08 PM  
**To:** KHNPDCDRAIsPEm Resource  
**Subject:** FW: APR1400 Design Certification Application RAI 259-8335 (08.03.01 - AC Power Systems (Onsite))  
**Attachments:** APR1400 DC RAI 259 EEB 8335.pdf

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**From:** Ciocco, Jeff  
**Sent:** Monday, October 19, 2015 1:02 PM  
**To:** apr1400rai@khnp.co.kr; Harry (Hyun Seung) Chang <hyunseung.chang@gmail.com>; Andy Jiyong Oh <jiyong.oh5@gmail.com>; Steven Mannon <steven.mannon@aecom.com>  
**Cc:** Som, Swagata <Swagata.Som@nrc.gov>; Zimmerman, Jacob <Jacob.Zimmerman@nrc.gov>; Wunder, George <George.Wunder@nrc.gov>; Lee, Samuel <Samuel.Lee@nrc.gov>  
**Subject:** APR1400 Design Certification Application RAI 259-8335 (08.03.01 - AC Power Systems (Onsite))

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 this RAI. 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  
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**Hearing Identifier:** KHNP\_APR1400\_DCD\_RAI\_Public  
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**Sent Date:** 10/20/2015 2:07:53 PM  
**Received Date:** 10/20/2015 2:08:01 PM  
**From:** Ciocco, Jeff

**Created By:** Jeff.Ciocco@nrc.gov

**Recipients:**  
"KHNPDCDRAIsPEm Resource" <KHNPDCDRAIsPEm.Resource@nrc.gov>  
Tracking Status: None

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**Reply Requested:** No  
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# REQUEST FOR ADDITIONAL INFORMATION 259-8335

Issue Date: 10/19/2015  
Application Title: APR1400 Design Certification Review – 52-046  
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.  
Docket No. 52-046  
Review Section: 08.03.01 - AC Power Systems (Onsite)  
Application Section: 8.3.1

## QUESTIONS

08.03.01-21

By letter dated July 29, 2015, the applicant provided a response to RAI 32-7946, Question 08.03.01-1. The response addresses the staff questions on automatic bus transfer of the Class 1E Medium Voltage switchgear buses to alternate preferred power source. The staff has the below follow-up questions to assess if the automatic bus transfer is capable of a voltage decay transfer (residual voltage transfer).

1. The applicant indicated that “If the fast transfer is blocked by the synchro-check relay output, a residual transfer will be performed automatically when the condition is met.” The applicant also indicated that bus transfer or reclosing will follow the guidance of ANSI/NEMA C50.41.

According to ANSI/NEMA C50.41, for fast transfer or reclosing, calculations and/or tests should be performed to determine the expected vectorial Volts/Hertz. Please provide a summary of the calculation to ensure a residual transfer is achieved without any impact or damage to the Class 1E motors or any important to safety motors. The NRC staff recognizes that the studies need detailed knowledge of the motors, driven equipment and the power supply. Therefore, also provide the assumptions made for such calculations.

The staff is also concerned about the possible causes of failure of bus transfer schemes. Please discuss that what measures would be taken to prevent such interruption of bus transfer. Typical examples of incomplete bus transfer could be due to the loss of motors because of inability to reaccelerate, out-of-phase transfer by set point error of under-voltage relays, motor contacts drop out, and current transformer saturation due to inrush current when SAT is loaded.

2. Discuss the protection relay selection and setting criteria for the bus transfer scheme.
3. In DCD Tier 1, Section 2.6, Table 2.6.1-3, Design Commitment item 8, discusses automatic bus transfer only. Please revise the DCD accordingly to reflect fast and residual bus transfer.

