

KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Monday, March 28, 2016 1:16 PM
To: apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Junggho Kim (jhokim082@gmail.com); Andy Jiyong Oh; Steven Mannon
Cc: Ray, Sheila; Zimmerman, Jacob; Wunder, George; Williams, Donna
Subject: APR1400 Design Certification Application RAI 453-8521 (08.02 - Offsite Power System)
Attachments: APR1400 DC RAI 453 EEB 8521.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, 12 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
jeff.ciocco@nrc.gov



Hearing Identifier: KHNP_APR1400_DCD_RAI_Public
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Subject: APR1400 Design Certification Application RAI 453-8521 (08.02 - Offsite Power System)
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From: Ciocco, Jeff
Created By: Jeff.Ciocco@nrc.gov

Recipients:

"Ray, Sheila" <Sheila.Ray@nrc.gov>
Tracking Status: None
"Zimmerman, Jacob" <Jacob.Zimmerman@nrc.gov>
Tracking Status: None
"Wunder, George" <George.Wunder@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
"Junggho Kim (jhokim082@gmail.com)" <jhokim082@gmail.com>
Tracking Status: None
"Andy Jiyong Oh" <jiyong.oh5@gmail.com>
Tracking Status: None
"Steven Mannon" <steven.mannon@aecom.com>
Tracking Status: None

Post Office: HQPWMSMRS07.nrc.gov

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REQUEST FOR ADDITIONAL INFORMATION 453-8521

Issue Date: 03/28/2016
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 08.02 - Offsite Power System
Application Section:

QUESTIONS

08.02-11

By letter dated December 23, 2015, the applicant provided a response to RAI 8184, Question 08.02-7. In the response, the applicant stated the necessary design evaluation and analyses against the OPCs along with the final solution for the APR 1400 design certification is the scope of the COL applicant as described in DCD Tier 2, Subsection 8.2.3 and specified in COL item 8.2(7).

10 CFR Part 52.47(a)(3) states that the application must include:

- “(i) The principal design criteria for the facility. Appendix A to 10 CFR part 50, general design criteria (GDC), establishes minimum requirements for the principal design criteria for watercooled nuclear power plants similar in design and location to plants for which construction permits have previously been issued by the Commission and provides guidance to applicants in establishing principal design criteria for other types of nuclear power units;
- (ii) The design bases and the relation of the design bases to the principal design criteria;”

In order to verify applicants of new reactors have addressed the design vulnerability identified at Byron in accordance with the requirements specified in General Design Criterion (GDC) 17, “Electric Power Systems,” in Appendix A, “General Design Criteria for Nuclear Power Plants,” of 10 CFR 50, and the design criteria for protection systems under 10 CFR 50.55a(h)(3), the DCD should contain a description of how the design conforms the above regulations in regards to the design vulnerability described in BL 2012-01. The description in the DCD should have sufficient detail that the COL applicant can implement the design to detect, alarm and mitigate open phase conditions in accordance with 10 CFR Part 52.47(a)(3)(i) and 52.47(a)(3)(ii). Additionally, the staff position on this issue is provided in Branch Technical Position BTP 8-9 (ML15057A085).

Please provide the following information:

- A) Describe the protection scheme design for important-to-safety buses (non-safety or safety-related) to detect and automatically respond to a single-phase open circuit condition or high impedance ground fault condition on credited offsite power circuits.
- B) If the important-to-safety buses are not powered by offsite power sources during at power condition, explain how the surveillance tests are performed to verify that a single-phase open circuit condition or high impedance ground fault condition on an offsite power circuit is detected.
- C) Discuss how an unintended separation from the off-site power source due to a false indication of an open phase can be prevented.
- D) Based on the power system configuration of APR1400, provide a summary of analysis performed for ground-fault, and open phase condition
- E) Please provide ITAAC to confirm that OPC conditions are detected, alarmed and mitigated against.



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