

KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Tuesday, September 01, 2015 6:41 AM
To: apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Harry (Hyun Seung) Chang; Andy Jiyong Oh; Steven Mannon
Cc: Ray, Sheila; Wunder, George; Olson, Bruce; Lee, Samuel
Subject: APR1400 Design Certification Application RAI 191-8210 (14.02 - Initial Plant Test Program - Design Certification and New License Applicants)
Attachments: APR1400 DC RAI 191 EEB 8210.pdf; image001.jpg

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, 60 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,

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Sent Date: 9/1/2015 6:41:09 AM
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REQUEST FOR ADDITIONAL INFORMATION 191-8210

Issue Date: 09/01/2015

Application Title: APR1400 Design Certification Review – 52-046

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

Docket No. 52-046

Review Section: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants

Application Section:

QUESTIONS

14.02-11

REQUIREMENTS

GDC 17 requires that onsite and offsite power systems provide sufficient capacity and capability and

GDC 18 requires the testing of electrical power systems

ISSUE AND INFORMATION NEEDED

DCD Tier 2, Section 8.4.1.3, "Alternate AC Power Source," states that the 4.16kV non-Class 1E AAC GTG is provided as an AAC source to mitigate an SBO. Section 14.2.12.89 and 14.2.12.90 do not provide sufficient detail to demonstrate that the AAC GTG can obtain rated voltage and frequency within 2 minutes after the receipt of a starting signal. Please discuss the specific mechanical and electrical trips, indications, alarms, and number of starts required. Furthermore, discuss a) how adequate ventilation is assessed, b) how the continuous rating is verified, c) how the time requirements are verified for reaching required voltage and frequency, d) how these tests verify that upon a simulated station blackout that the GTG starts from standby to energize the buses, e) how these tests demonstrate the capability to reject a loss of the largest single load, and f) how these tests demonstrate the ability to synchronize the GTG with offsite power while loaded upon a simulated restoration of offsite power.

For the support systems, discuss how the adequacy and operation of the fuel systems is demonstrated. Similarly, discuss how the operation of the lube oil and cooling systems are demonstrated. the exhaust/intake system should be specifically demonstrated. Discuss why the exhaust/intake system, one of the EDG support systems is not specifically demonstrated, considering it is necessary for the EDG to complete the safety function..

14.02-12

REQUIREMENTS

GDC 17 requires that onsite and offsite power systems provide sufficient capacity and capability and GDC 18 requires the testing of electrical power systems

ISSUE AND INFORMATION NEEDED

DCD Tier 2 Section 14.2.12.1.86 discusses the EDG mechanical system test.

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- A) Discuss whether this test verifies that EDG diesel generator and auxiliary system alarms, interlocks, and control functions perform as designed and if so, how.
- B) Section 8.3.1.1.3.2, "Starting Mechanism and System" provides the mechanical and electrical trips to protect the EDGs. However 3.2 in the EDG mechanical system test does not include low temperature in the cooling water system, low level in fuel oil day tank, and low level in the cooling water system. Please explain why the aforementioned trips are not demonstrated as operable and function as described in Section 8.3.1. In addition, please explain how the electrical trips, as listed in 8.3.1.3.3, "Tripping Devices" are demonstrated.
- C) Please discuss how this test demonstrates that EDG instrumentation operates over the design range using actual or simulated signals.
- D) Please discuss how this test demonstrates that EDG alarms and interlocks occur as designed.
- E) Please discuss how this test demonstrates that the EDG instrumentation responds as designed to actual or simulated limiting malfunctions or failures.
- F) Please discuss how this test demonstrate that the EDG instrumentation response meets the accident analysis assumptions, such as time response, accuracy, and control stability.
- G) Please confirm that part 3.5 (demonstrating capability for 35 consecutive starts) is 35 consecutive starts, without failures.

14.02-13

REQUIREMENTS

GDC 17 requires that onsite and offsite power systems provide sufficient capacity and capability and
GDC 18 requires the testing of electrical power systems

ISSUE AND INFORMATION NEEDED

DCD Tier 2 Section 14.2.12.1.87 discusses the EDG electrical system test.

- A) Discuss whether this test verifies that EDG alarms, interlocks, and control functions perform as designed and if so, how.
- B) Adequate ventilation is necessary for the operation of EDGs. Discuss how adequate ventilation is verified before performing tests on the EDG.

14.02-14

REQUIREMENTS

GDC 17 requires that onsite and offsite power systems provide sufficient capacity and capability and
GDC 18 requires the testing of electrical power systems

ISSUE AND INFORMATION NEEDED

DCD Tier 2 Section 14.2.12.1.88 discusses the EDG auxiliary systems test.

- A) Please discuss why EDG intake air and exhaust gas systems' ability to support full load capacity is not included in this test, in order to demonstrate that the system operates as described in Section 9.5.8. A

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test is required to show that the EDG intake air and exhaust gas systems provide sufficient capacity to support full load operation.

B) Discuss how this test verifies that the starting air system is capable of achieving a single EDG start when the receiver is at the minimum receiver design pressure.

