

## **KHNPDCDRAIsPEm Resource**

---

**From:** Ward, William  
**Sent:** Wednesday, July 06, 2016 11:28 AM  
**To:** KHNPDCDRAIsPEm Resource  
**Subject:** FW: APR1400 Design Certification Application RAI 501-8635 [9.5.4 - Emergency Diesel Engine Fuel Oil Storage & Transfer System]  
**Attachments:** APR1400 DC RAI 501 SPSB 8635.pdf

---

**From:** Ward, William  
**Sent:** Friday, July 01, 2016 6:49 PM  
**To:** 'apr1400rai@khnp.co.kr' <apr1400rai@khnp.co.kr>; KHNPDCDRAIsPEm Resource <KHNPDCDRAIsPEm.Resource@nrc.gov>; 'daegeun.ahn@gmail.com' <daegeun.ahn@gmail.com>; 'Andy Jiyong Oh' <jiyong.oh5@gmail.com>; Tyree, Christopher (christopher.tyree@aecom.com) <christopher.tyree@aecom.com>  
**Cc:** Williams, Donna <Donna.Williams@nrc.gov>; Ciocco, Jeff <Jeff.Ciocco@nrc.gov>; Wunder, George <George.Wunder@nrc.gov>; Dias, Antonio <Antonio.Dias@nrc.gov>; George, Andrea <Andrea.George@nrc.gov>  
**Subject:** APR1400 Design Certification Application RAI 501-8635 [9.5.4 - Emergency Diesel Engine Fuel Oil Storage & Transfer System]

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,

**William R. Ward, P.E.**  
**Senior Project Manager**  
**U.S. Nuclear Regulatory Commission**  
**m/s T6-D38M**  
**Washington, DC, 20555-0001**  
NRO/DNRL/Licensing Branch 2  
ofc T6-D31  
ofc (301) 415-7038

**U.S. NRC PROTECTING PEOPLE AND THE ENVIRONMENT**  
*Please consider the environment before printing this email.*

**Hearing Identifier:** KHNP\_APR1400\_DCD\_RAI\_Public  
**Email Number:** 560

**Mail Envelope Properties** (b0c68a2cb5e540b884680e7108f94cf3)

**Subject:** FW: APR1400 Design Certification Application RAI 501-8635 [9.5.4 - Emergency Diesel Engine Fuel Oil Storage & Transfer System]  
**Sent Date:** 7/6/2016 11:27:32 AM  
**Received Date:** 7/6/2016 11:27:33 AM  
**From:** Ward, William

**Created By:** William.Ward@nrc.gov

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

**Post Office:** HQPWMSMRS05.nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	1459	7/6/2016 11:27:33 AM
APR1400 DC RAI 501 SPSB 8635.pdf		78476

**Options**  
**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**  
**Recipients Received:**

## REQUEST FOR ADDITIONAL INFORMATION 501-8635

Issue Date: 07/01/2016

Application Title: APR1400 Design Certification Review – 52-046

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

Docket No. 52-046

Review Section: 09.05.04 - Emergency Diesel Engine Fuel Oil Storage and Transfer System

Application Section: 9.5.9

### QUESTIONS

As required by 10 CFR 52.47(b)(1), the proposed inspections, tests, analyses, and acceptance criteria (ITAAC) that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a facility that incorporates the design certification has been constructed and will be operated in conformity with the design certification, the provisions of the Act, and the Commission's rules and regulations.

According to NUREG-0800, SRP Section 14.3, the term “as-built” means the physical properties of the structure, system, or component (SSC) following the completion of its installation or construction activities at its final location at the plant site.

#### **09.05.04-15**

The inspections, tests, analyses statement for design commitment 8.a in DCD Tier 1, Table 2.6.6-1, “Alternate AC Source ITAAC,” indicates that “an analysis and test of each fuel oil transfer pump will be performed to determine the maximum demand at gas turbine generator (GTG) continuous rated load while simultaneously increasing day tank level.” The acceptance criteria for the design commitment is as follows: a report exists and concludes that the size and flow rate of each as-built GTG fuel oil transfer pump bounds the analysis.

In response to a number of issues with ITAAC submittals, the NRC staff issued Regulatory Issue Summary 2008-05, Revision 1, “Lessons Learned to Improve Inspections, Tests, Analyses, and Acceptance Criteria Submittal” (ADAMS Accession No. ML102500244). Two examples of the issues identified in the RIS are:

- Applicants should ensure that design commitments and ITAAC are consistent, i.e., the language and details of the ITAAC should agree with the language of the design commitment.
- Applicants should avoid expanding the ITAAC for functional arrangement of a system beyond the definition of functional arrangement as a physical arrangement of SSCs (it does not include testing, qualification, and analytical attributes).

The use of the expression “a report exists” is not sufficient for verification that the “as-built” (as installed) alternate AC (AAC) GTG fuel oil pumps meet the design commitment, as the acceptance criteria does not verify the specific design commitment. By extension, performance of the ITAAC as written may not provide reasonable assurance that the AAC GTG would be able to perform its function for the duration of the required station blackout (SBO) coping time, given that the fuel oil day tank contains enough fuel oil for only 60 minutes of continuous operation at GTG rated load. The acceptance criteria use of a “report exists” would provide confirmation that the components and system are properly sized and designed to meet its

## REQUEST FOR ADDITIONAL INFORMATION 501-8635

demand; however, the use of a report would not verify that the actual installed components and system would perform its SBO function for the coping time determined by the applicant (specifically, that at continuous rated AAC GTG load, the fuel oil day tank level will rise with each fuel oil transfer pump running). Additionally, the ITA for design commitment 8.a does not specify that the testing and analysis are performed on the as-built fuel transfer pumps.

The applicant is requested to describe the specific inspections or tests in DCD Tier 1, Table 2.6.6-1 to verify that the “as-built” AAC GTG meets the design and performance commitments following the completion of its installation at its final location at the plant site.

### **09.05.04-16**

As discussed in RAI 8635, Question 9.5.4-15, RIS 2008-05 discusses the “functional arrangement” of a system as the physical arrangement of structures, systems and components.

As shown in DCD Tier 1, Table 2.6.6-1, “Alternate AC Source ITAAC,” design commitment 1 contains a requirement to perform inspection of the as-built alternate AC (AAC) source in order to verify that the functional arrangement of the AAC source is as described in DCD Tier 1, Subsection 2.6.6.1. Acceptance criteria for design commitment 1 ITAAC requires that the as-built AAC source conforms with the functional arrangements as described in Subsection 2.6.6.1. However, DCD Tier 1, Subsection 2.6.6.1 does not contain any functional arrangement information.

The applicant is requested to update DCD Tier 1 with the appropriate AAC source functional arrangement information and/or the corresponding figures to allow for the design review and verification of the ITAAC design commitment.