KHNPDCDRAIsPEm Resource

From:	Ciocco, Jeff
Sent:	Wednesday, July 15, 2015 2:53 PM
To:	apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Harry (Hyun Seung) Chang; Yunho Kim; Christopher Tyree
Cc:	Hernandez, Raul; Dias, Antonio; Wunder, George; Umana, Jessica; Lee, Samuel
Subject:	APR1400 Design Certification Application RAI 77-7991 (09.01.03 - Spent Fuel Pool Cooling and Cleanup System)
Attachments:	APR1400 DC RAI 77 SPSB 7991.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, 45 days to respond to the RAI question. We may adjust the schedule accordingly.

Please submit your RAI response to the NRC Document Control Desk.

Thank you,

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United States Nuclear Regulatory Commission
Protecting People and the Environment

Hearing Identifier: KHNP_APR1400_DCD_RAI_Public
Email Number: 86

Mail Envelope Properties (36d5d773360a413987b3734e6ae9632b)

Subject: APR1400 Design Certification Application RAI 77-7991 (09.01.03 - Spent Fuel Pool Cooling and Cleanup System)
Sent Date: 7/15/2015 2:53:15 PM
Received Date: 7/15/2015 2:53:17 PM
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Files	**Size**	**Date & Time**
MESSAGE	638	7/15/2015 2:53:17 PM
APR1400 DC RAI 77 SPSB 7991.pdf	96353	
image001.jpg	5040	

Options
Priority: Standard
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REQUEST FOR ADDITIONAL INFORMATION 77-7991

Issue Date: 07/15/2015
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 09.01.03 - Spent Fuel Pool Cooling and Cleanup System
Application Section: Section 9.1.3

QUESTIONS

09.01.03-1
RAI 9.1.3-1

GDC 2 requires that nuclear power plant SSCs important to safety be designed to withstand the effects of natural phenomena. Acceptance for meeting this criterion is based on conformance to positions C.1, "Seismic Design;" C.2, "Protection Against Extreme Winds;" C.6, "Drainage Protection;" and C.8, "Makeup Water," of RG 1.13 and position C.1 of RG 1.29.

In DCD Tier 2 Section 9.1.3.2.1.1, the applicant describes the SFPCS cooling pumps and states that the net positive suction head (NPSH) available from the system exceeds each pump's required NPSH. This is based on the minimum pool level and the maximum pool temperature of 60 °C (140 °F). DCD Tier 2, Section 9.1.3.1, states that, to preclude loss of minimum SFP water level that provides proper shielding, all piping that penetrates the pool are located approximately 3 m (10 ft) above the top of the spent fuel assemblies, and all piping extending down into the pool have siphon breaker holes at or above this level.

The SFPCS is a safety-related system credited to remain operational following a safe shutdown earthquake. In order to operate the SFP cooling pumps, the SFP needs to maintain a minimum water level in order to ensure sufficient NPSH to prevent pump cavitation. Additionally, DCD Tier 2 Section 9.1.3.5.4 states that the SFP cooling pumps are protected from cavitation by an automatic stop interlock on SFP low level. The SFP cleanup system is not designed to seismic category I standards; this system has several connections to the SFP. The staff evaluated the system description and determined that additional information is required.

The applicant is requested to:

a. indicate in the FSAR the minimum water level needed to provide the SFP cooling pumps with adequate NPSH,

b. indicate the elevation of all pipes that interact with the SFP (pipes that penetrate the SFP wall and pipes that extend down into the pool),

c. indicate in the FSAR the setpoint (water level) that activates the interlock that stops the SFP cooling pumps and protects them from cavitation, and

d. provide an evaluation that demonstrates that the failure of non-seismic category I components will not drain the SFP below the minimum water level needed to operate the safety related SFP cooling pumps.

09.01.03-2
RAI 9.1.3-2

GDC 61 requires that the fuel storage system be designed to assure adequate safety under normal and postulated accident conditions. The system shall be designed with residual heat removal that reflects the importance to safety of decay heat and other residual heat removal.

NUREG-0800, SRP 9.1.3.III.1 states that the application section describing the system functional performance requirements is reviewed to determine that it describes minimum system heat transfer and system flow requirements for normal plant operation, component operational degradation requirements (i.e., pump leakage, etc.) and also describes the procedures that will be followed to detect and correct these conditions should degradation become excessive.

The staff evaluated the system description provided in DCD Tier 2, Section 9.1.3, and determined that additional information was needed. The system description does not provide the values of the maximum normal and abnormal (full core offload) SFP heat loads, nor does it states what the minimum heat exchanger heat transfer and minimum system flow area. The staff needs this information to confirm that there is adequate cooling of the spent fuel in the SFP.

The applicant is requested to update DCD Tier 2, Section 9.1.3, to include the values of the maximum normal and abnormal (full core offload) SFP heat loads and the minimum heat exchanger system flow

09.01.03-3
RAI 9.1.3 – 3: COL AI

GDC 63 requires appropriate systems in fuel storage and radioactive waste systems and handling areas to detect conditions that may cause loss of residual heat removal capability and excessive radiation levels and to initiate appropriate safety actions. For spent fuel storage facilities, GDC 63 also requires spent fuel pool water level, pool temperature, and pool building radiation monitoring to protect personnel and to prevent significant offsite radiation doses.

The SFP water provides cooling for the stored fuel and radiation shielding; therefore, monitoring pool leakage is relevant to GDC 63. In DCD Tier 2, Section 9.1.3, the applicant presented COL 9.1(1), which requires the COL applicant to provide operational procedures and a maintenance program related to leak detection and contamination control.

REQUEST FOR ADDITIONAL INFORMATION 77-7991

The staff evaluated the proposed COL information item and determined that additional information is needed. The proposed COL information item does not specify which detection equipment or contamination control programs need to be provided for an operational procedure and maintenance program. The COL information item also lacks the inspection interval for the maintenance program (for example, DCD Tier 2, Section 9.1.2.2.2 states that the SFP liner leakage monitoring system is monitored weekly and inspected every refueling).

The applicant is requested to update COL 9.1(1) to identify the detection equipment and contamination control programs that the COL applicant needs to create.


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