

KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Monday, August 31, 2015 10:24 AM
To: apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Harry (Hyun Seung) Chang; Andy Jiyong Oh; Christopher Tyree
Cc: Curran, Gordon; Dias, Antonio; Umana, Jessica; Wunder, George; Lee, Samuel
Subject: RE: APR1400 Design Certification Application RAI 181-8011 (09.01.04 - Light Load Handling System (Related to Refueling))
Attachments: APR1400 DC RAI 181 SPSB 8011.pdf; image001.jpg

With Attachment.

From: Ciocco, Jeff
Sent: Monday, August 31, 2015 8:53 AM
To: apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource <KHNPDCDRAIsPEm.Resource@nrc.gov>; Harry (Hyun Seung) Chang <hyunseung.chang@gmail.com>; Andy Jiyong Oh <jiyong.oh5@gmail.com>; Christopher Tyree <Christopher.tyree@aec.com>
Cc: Curran, Gordon <Gordon.Curran@nrc.gov>; Dias, Antonio <Antonio.Dias@nrc.gov>; Umana, Jessica <Jessica.Umana@nrc.gov>; Wunder, George <George.Wunder@nrc.gov>; Lee, Samuel <Samuel.Lee@nrc.gov>
Subject: APR1400 Design Certification Application RAI 181-8011 (09.01.04 - Light Load Handling System (Related to Refueling))

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.

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

Thank you,

Jeff Ciocco
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Hearing Identifier: KHNP_APR1400_DCD_RAI_Public
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Subject: RE: APR1400 Design Certification Application RAI 181-8011 (09.01.04 - Light Load Handling System (Related to Refueling))
Sent Date: 8/31/2015 10:24:03 AM
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From: Ciocco, Jeff

Created By: Jeff.Ciocco@nrc.gov

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Options

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REQUEST FOR ADDITIONAL INFORMATION 181-8011

Issue Date: 08/31/2015

Application Title: APR1400 Design Certification Review – 52-046

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

Docket No. 52-046

Review Section: 09.01.04 - Light Load Handling System (Related to Refueling)

Application Section:

QUESTIONS

09.01.04-2

NUREG-0800, SRP 9.1.4 specifies that acceptance for meeting the relevant aspects of GDC 61 and 62 are based, in part, on the guidelines of the American National Standards Institute/ American Nuclear Society (ANSI/ANS) 57.1.

DCD Tier 2, Section 9.1.4.5 commits to the use of electrical or mechanical interlocks to prevent criticality accidents, damage to fuel, and excessive personnel exposure, in accordance with ANSI/ANS 57.1 for the main fuel handling components.

DCD Tier 2, Section 9.1.4.2.1.6 provides a description of the spent fuel handling machine (SFHM) and states that, “[t]he SFHM has an auxiliary hoist that is provided to handle the light loads or fuel assembly using the appropriate handling tool. The auxiliary hoist also has a load-weighting system that includes a load cell and load indication to prevent the auxiliary hoist from being subjected to excessive force.”

Since the SFHM auxiliary hoist has the capability of handling fuel assemblies, it is unclear whether ANSI/ANS 57.1 interlocks or other features are applied to the auxiliary hoist.

The applicant is requested to describe any interlocks or control features provided with the auxiliary hoist on the SFHM.

09.01.04-3

NUREG-0800, SRP 14.3.7 states that the staff reviews the proposed 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 plant that incorporates the design certification is built and will operate in accordance with the design certification, the Atomic Energy Act, and the NRC’s regulations.

Item 7 in DCD Tier 1, Table 2.7.4.4-2 provides ITAAC for refueling machine (RM), spent fuel handling machine (SFHM) and control element assemblies change platform (CEACP) use of interlocks. The ITAAC acceptance criteria indicate that “[t]he RM, SFHM and CEACP hoists are interlocked to limit upward hoist travel.”

The staff finds these are unmeasurable acceptance criteria and additional criteria should be considered. In accordance with ANSI/ANS 57.1, Section 6.3.4.1.5, fuel handling equipment shall be

REQUEST FOR ADDITIONAL INFORMATION 181-8011

designed so that the operator will not be exposed to >2.5 mrem/h from an irradiated fuel unit, control component, or both, elevated to the up position interlock with the pool at normal operating water level.

The applicant is requested to further define the ITAAC acceptance criteria to represent more measureable criteria for ITAAC related to the interlocks.

09.01.04-4

NUREG-0800, SRP 9.1.4 indicates the SAR description of operating and test procedures is reviewed for whether load proof-testing, design-rated load testing, nondestructive testing, preventive checks, and attachment of the load ensure reliable load-handling operations.

Section A-1.n of RG 1.68 "Initial Test Programs for Water-Cooled Nuclear Power Plants" describes that refueling equipment testing should demonstrate the operability of protective interlocks and devices. Static testing of cranes, hoists, and associated lifting and rigging equipment should be at 125 percent of rated load, and full operational testing should be at 100 percent of rated load. Similar testing is found in NOG-1.

While DCD Tier 2, Section 9.1.4.4 indicates that components are tested, the staff is unable to locate any details or commitment of this testing in the Chapter 14 "Verification Program" or ITAAC.

The applicant is requested to justify not including this capacity testing in the initial test program or to modify the DCD accordingly.

