

KHNPDCDRAIsPEm Resource

From: Ward, William
Sent: Wednesday, July 06, 2016 11:28 AM
To: KHNPDCDRAIsPEm Resource
Subject: FW: APR1400 Design Certification Application RAI 502-8647 [7.7 - Control Systems]
Attachments: APR1400 DC RAI 502 HOIB 8647.pdf

From: Ward, William
Sent: Friday, July 01, 2016 7:06 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>; Mannon, Steven (steven.mannon@aecom.com) <steven.mannon@aecom.com>
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Subject: APR1400 Design Certification Application RAI 502-8647 [7.7 - Control Systems]

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.
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Subject: FW: APR1400 Design Certification Application RAI 502-8647 [7.7 - Control Systems]
Sent Date: 7/6/2016 11:28:07 AM
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From: Ward, William

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REQUEST FOR ADDITIONAL INFORMATION 502-8647

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: 07.07 - Control Systems
Application Section: DCD Tier 2 Section 7.7.1.1

QUESTIONS

07.07-17

Regulatory Basis:

10 CFR 52.47(a)(3)(i) requires compliance with 10 CFR 50, Appendix A, "General design criteria [GDC]." GDC 19 requires in part that, "Equipment at appropriate locations outside the control room shall be provided (1) with a design capability for prompt hot shutdown of the reactor, including necessary instrumentation and controls to maintain the unit in a safe condition during hot shutdown...."

10 CFR 52.47(a)(8) requires compliance with parts of 10 CFR 50.34(f). 10 CFR 50.34(f) requires in part that, "...each applicant for a design certification,...under part 52 of this chapter shall demonstrate compliance with the technically relevant portions of the requirements in paragraphs (f)(1) through (3) of this section..." 10 CFR 50.34(f)(2)(iii) requires, "...a control room design that reflects state-of-the-art human factor principles..."

10 CFR 52.47(a)(9) requires, "For applications for light-watercooled nuclear power plants, an evaluation of the standard plant design against the Standard Review Plan (SRP) revision in effect 6 months before the docket date of the application...."

10 CFR 52.47(a)(28) requires compliance with 10 CFR 50.150. 10 CFR 50.150 states, in part, "using realistic analyses, the applicant shall identify and incorporate into the design those design features and functional capabilities to show that, with reduced use of operator actions: (i) The reactor core remains cooled, or the containment remains intact; and (ii) Spent fuel cooling or spent fuel pool integrity is maintained." SRP Section 19.5 states in part, "the staff shall consider...use of operator action to be reduced when (1) all necessary actions to control the nuclear facility can be performed in the control room, or at an alternate station containing equipment specifically designed for control purposes, and (2) a reduced amount of active operator intervention, if any, is required to meet the assessment criteria in 10 CFR 50.150(a)(1)."

Information in the Design Certification Application:

DCD Tier 2, Section 7.7.1.1.o.3.c states, "The RCC [Remote Control Center] is designed against aircraft impact to meet the requirements of 10 CFR 50.150...The operator can shut down the reactor from the MCR [Main Control Room] 10 minutes before aircraft impact upon the MCR in the auxiliary building, and the control and monitoring is transferred to the RCC using a transfer switch located in the MCR."

REQUEST FOR ADDITIONAL INFORMATION 502-8647

Additionally, the response to RAI 356-7881, Question 07-5 (ADAMS Accession No. ML16126A066), states, "The RCC provides manual control and monitoring means to bring the plant to hot standby under accident conditions. The RCC is manipulated by one reactor operator who monitors and controls the plant." Further, the response states that "the controls and displays available at the RCC have been designed according to the guidelines in NUREG-0700, "Human-System Interface Design Review Guidelines." The RCC has not been specifically described in Chapter 18; however, design of the RCC will follow the NUREG-0711, human factors engineering process as a local control station facility."

Questions:

1. Describe any design features and functional capabilities that will provide operators with advance notification of an aircraft impact event such that they will be able to perform necessary actions before leaving the MCR (e.g., trip the reactor and transfer control to the RCC from the MCR) and transit to the RCC before aircraft impact occurs. Also, provide a description of the design features and functional capabilities in the DCD.
2. Explain why 10 minutes is a sufficient amount of time for operators to transfer control from the MCR to the RCC and walk to the RCC before aircraft impact occurs.
3. The application describes the RCC as an alternative to the main control room, and therefore it is akin to the remote shutdown room (RSR), not a local control station. Therefore, the design of the RCC should conform to the design method described in NUREG-0711 in the same way that the RSR conforms to this method. Provide direction in the "HSI Design Implementation Plan," APR1400-E-I-NR-14007, Section 4.2.8, "Central Facilities," for the RCC to follow the design process described in NUREG-0711.