KHNPDCDRAIsPEm Resource

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Sent: Tuesday, May 10, 2016 11:56 AM
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Cc: Harbuck, Craig; Dias, Antonio; Umana, Jessica; Williams, Donna
Subject: APR1400 Design Certification Application RAI 478-8568 (16 - Technical Specifications)
Attachments: APR1400 DC RAI 478 SPSB 8568.pdf

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 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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United States Nuclear Regulatory Commission
Protecting People and the Environment

Hearing Identifier: KHNP_APR1400_DCD_RAI_Public
Email Number: 531

Mail Envelope Properties (bba8aba8772f4b8bada50bd55772a359)

Subject: APR1400 Design Certification Application RAI 478-8568 (16 - Technical Specifications)
Sent Date: 5/10/2016 11:55:38 AM
Received Date: 5/10/2016 11:55:43 AM
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Files	**Size**	**Date & Time**
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APR1400 DC RAI 478 SPSB 8568.pdf	171487	
image001.jpg	5040	

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Priority: Standard
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REQUEST FOR ADDITIONAL INFORMATION 478-8568

Issue Date: 05/10/2016
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 16 - Technical Specifications
Application Section: 16.3.1.9, 16.3.6.6, 16.3.8.1, 16.3.8.2, 16.3.8.10, 16.3.9.4, 16.3.9.5

QUESTIONS

16-139

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose TS prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for technical specifications to be included as part of the operating license for a nuclear power facility. NUREG-1432, "Standard Technical Specifications-Combustion Engineering Plants," Rev. 4, provides NRC guidance on format and content of technical specifications as one acceptable means to meet 10 CFR 50.36 requirements. Staff needs to evaluate all technical differences from standard TS (STS) NUREG-1432, STS Combustion Engineering Plants, Rev. 4, which is referenced by the DC applicant in DCD Tier 2 Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the generic TS to ensure adequate protection of public health and safety, and the completeness and accuracy of the generic TS Bases.

Notes from the February 24-25, 2016, meeting between KHNP and NRC staff indicate that NRC staff would create a followup RAI-Question to RAI-Questions 16-65, 16-66, and 16-76. The proposed changes to Revision 0 of generic TS Subsection 3.1.9 and Bases require corrections as indicated in the below comments and in markups of revised or new material for this subsection that KHNP submitted in response to RAI-Questions 16-65, 16-66, and 16-76.

1. Why does the proposed revised LCO only require closure with power removed for CV-576 and CV-577? Why not also require closure for CV-575? Then, the LCO could say:

   Charging flow shall be maintained ≤ 567.8 L/min (150 gpm) by closing and removing power (as applicable) to two of the three charging flow restriction orifice bypass valves (CV-575, CV-576, and CV-577).

2. Since only two of the three orifice bypass valves (CV-575, CV-576, and CV-577) are required to be closed with power removed (except for the local manually operated valve CV-575(?)), Specification 3.1.9 Condition A could say:

   A. One or more required charging flow restriction orifice bypass valves not closed.

   OR

   One or more required charging flow restriction orifice bypass valves with power not removed.

3. The applicant is requested to describe why a generic TS LCO is not needed to specify OPERABILITY of the instrumentation for the auto-closure of CV-576 on Hi-Hi CVCS charging flow (176 gpm) in MODE 5 with loops not filled, including during mid-loop operation?
4. Regarding the Note to Specification 3.1.9 Required Action A.1, the Bases should describe the circumstances in which auxiliary charging pump flow would be needed in MODE 5 during mid-loop operation.
5. The proposed changes described in the markups of Subsection 3.1.9 and Bases in the response to RAI-Quesrtion 16-65 have some awkward phrasing, which needs improvement. Suggested changes are indicated by the following suggested edits:

3.1.9 Charging Flow

LCO 3.1.9 Charging flow shall be maintained ≤ 567.8 L/min (150 gpm) by closing and removing power (as applicable) to two of the three charging flow restriction orifice bypass valves (CV-575, CV-576, and CV-577).

APPLICABILITY: MODE 5 **with reactor vessel level ≤ EL 119 ft 1 in [hot leg level indication ≤ 100%].indication ≤ 100%].** ~~during MID-LOOP operation for maintenance.~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. **One or more required charging** ~~Charging~~ flow restriction orifice bypass valve**s** ~~is~~ not closed. **OR** **One or more required charging flow restriction orifice bypass valves with power not removed.**	A.1 ----------NOTE---------- Auxiliary charging pump operation is allowed. ---------- Turn off **all** charging pumps.	 Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY

SR	3.1.9.1	Verify that **required** charging flow restriction orifice bypass valves are closed and power to the valves is ~~off~~ **removed**.	8 hours

16-140

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose TS prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for technical specifications to be included as part of the operating license for a nuclear power facility. NUREG-1432, "Standard Technical Specifications-Combustion Engineering Plants," Rev. 4, provides NRC guidance on format and content of technical specifications as one acceptable means to meet 10 CFR 50.36 requirements. Staff needs to evaluate all technical differences from standard TS (STS) NUREG-1432, STS Combustion Engineering Plants, Rev. 4, which is referenced by the DC applicant in DCD Tier 2 Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the generic TS to ensure adequate protection of public health and safety, and the completeness and accuracy of the generic TS Bases.

This request stems from discussion at the February 2016 meeting with the applicant.

1. The applicant is requested to clarify B 3.6.6 ASA Section to point out the following, and that the associated Class 1E 4160 Vac electrical division's SCS pump may be aligned for use in place of the CS pump *in MODES 1, 2, and 3 only*

   Class 1E 4160 Vac Electrical **Division I**

   · Train A -- EDG A -- SCS Pump 1

   · Train C -- EDG C -- CS Pump 1 – CS Division A

   Class 1E 4160 Vac Electrical **Division II**

   · Train B -- EDG B -- SCS Pump 2

   · Train D -- EDG D -- CS Pump 2 – CS Division B

2. The applicant is requested to clarify B 3.6.6 Applicability Section last sentence "... the containment spray is not required to be OPERABLE in MODES 5 and 6." This should be modified to list the exception that when the unit is in MODE 6 with REDUCED RCS INVENTORY, LCO 3.9.5.b requires the CS pump, which is in the same Class 1E 4160 Vac Electrical Division as the SCS train in operation, to be OPERABLE. (Depending on how other concerns about the Applicability of Subsection 3.9.5 are resolved, this sub-question may be moot.)

3. The applicant is requested to insert a second paragraph in the Bases for SR 3.9.5.3:

   > To be considered OPERABLE, the required CS pump must be in standby for manual start and its flow path must be aligned to perform the shutdown cooling function. The required CS pump must meet the requirements of the associated operating SCS pump in the event the operating SCS pump stops. Therefore, the Surveillance Requirements of this Specification must be applied to the required CS pump, as necessary.

4. LCO 3.9.5.b should say “electrical division” instead of “train” because the spray pump and the shutdown co LCO 3.9.5.b should say “electrical division” instead of “train” because the spray pump and the shutdown cooling pump are powered from separate Class 1E 4160 V buses. That is, “With REDUCED RCS INVENTORY, the containment spray pump in the same ~~train~~ **electrical division** as an operating SCS train shall be OPERABLE.”

5. The applicant is requested to include the following SRs in Subsections 3.9.4 and 3.9.5, as appropriate, for the required SCS train(s), and the required CS pump and associated shutdown cooling flow path alignment; or justify not including them:

SURVEILLANCE		FREQUENCY
SR 3.9.5.5	Verify each SCS manual, power-operated, and automatic valve, and each CS system manual and power-operated valve, which are necessary to align the required CS pump flow path for SCS operation, that are not locked, sealed, or otherwise secured in position are in the correct position.	31 days
SR 3.9.5.6	Verify the required CS pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with Inservice Testing Program

16-141

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose TS prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for technical specifications to be included as part of the operating license for a nuclear power facility. NUREG-1432, "Standard Technical Specifications-Combustion Engineering Plants," Rev. 4, provides NRC guidance on format and content of technical specifications as one acceptable means to meet 10 CFR 50.36 requirements. Staff needs to evaluate all technical differences from standard TS (STS) NUREG-1432, STS Combustion Engineering Plants, Rev. 4, which is referenced by the DC applicant in DCD Tier 2 Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the generic TS to ensure adequate protection of public health and safety, and the completeness and accuracy of the generic TS Bases.

This request stems from discussion at the February 2016 meeting with the applicant.

1. The applicant is requested to discuss consistent use of divisions, channels, subsystems, and trains (Deviation Report [DR] Section III.4.2.3); for example, the following seem inconsistent.

    - (DR Section III.4.1.2) "Class 1E 125 Vdc system consists of four independent subsystems, trains A, B, C, and D, each corresponding to one of the four (DR Section III.4.1.2) "Class 1E 125 Vdc system consists of four independent subsystems, trains A, B, C, and D, each corresponding to one of the four reactor protection instrumentation channels A, B, C, and D ..."
    - (DR Section III.4.1.3) "The Class 1E 120 Vac I&C power system is separated into four subsystems, trains A, B, C, and D that supply power to the plant protection system channels A, B, C, and D.

    The applicant is requested to revise the DCD where appropriate to consistently use the terms *divisions, channels, subsystems, load groups, and trains* to prevent incorrect interpretations of generic TS and Bases that could occur if these terms are used inconsistently.

2. The applicant is requested to state for each of the following safety systems the minimum number of trains needed to perform the safety function, assuming the limiting design basis event and the associated worst case single failure, and for each system, what constitutes redundancy.
    - Safety Injection System
    - Containment Spray System
    - Essential Service Water System
    - Component Cooling Water System

- Auxiliary Feedwater System (for each SG)
- Containment Spray System

The staff needs this information to understand how generic TS 3.8.1 Required Actions A.2 and B.2 are intended to be implemented; these actions state:

A.2 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable. | 24 hours from discovery of no offsite power to one division concurrent with inoperability of redundant required feature(s)

B.2 Declare required feature(s) supported by the inoperable EDG(s) inoperable when its redundant required feature(s) is inoperable. | 4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)

16-142

Paragraph (a)(11) of 10 CFR 52.47 and paragraph (a)(30) of 10 CFR 52.79 state that a design certification (DC) applicant and a combined license (COL) applicant, respectively, are to propose TS prepared in accordance with 10 CFR 50.36 and 50.36a. 10 CFR 50.36 sets forth requirements for technical specifications to be included as part of the operating license for a nuclear power facility. NUREG-1432, "Standard Technical Specifications-Combustion Engineering Plants," Rev. 4, provides NRC guidance on format and content of technical specifications as one acceptable means to meet 10 CFR 50.36 requirements. Staff needs to evaluate all technical differences from standard TS (STS) NUREG-1432, STS Combustion Engineering Plants, Rev. 4, which is referenced by the DC applicant in DCD Tier 2 Section 16.1, and the docketed rationale for each difference because conformance to STS provisions is used in the safety review as the initial point of guidance for evaluating the adequacy of the generic TS to ensure adequate protection of public health and safety, and the completeness and accuracy of the generic TS Bases.

This request stems from discussion at the February 2016 meeting with the applicant.

The applicant is requested to discuss how LCO 3.8.2 supports LCO 3.9.5, and how Subsection 3.8.10 Required Action A.2.4 is not a duplication of Subsection 3.8.10 Required Action A.1.

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