
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

RAI No.: 508-8592
SRP Section: 16 - Technical Specifications
Application Section: 16
Date of RAI Issue: 08/01/2016

Question No. 16-192

Paragraph (a)(11) of 10 CFR 52.47 states that a design certification (DC) applicant is to propose Technical Specifications (TS) prepared in accordance with 10 CFR 50.36 and 50.36a. NUREG-1432, "Standard Technical Specifications (STS)-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.

The Writer's Guide for Plant-Specific Improved Technical Specifications (TSTF-GG-05-01) also provides guidance for the format and content of the TS. There are format and content differences between the DCD and the Writer's Guide. These following corrections are necessary to ensure the completeness and accuracy of the TS and Bases.

The applicant is requested to address the following issues within the Bases for Technical Specification (TS) 3.7.11 "Control Room HVAC System (CRHS)." The applicant is requested to address the following issues within the Bases for Technical Specification (TS) 3.7.11 "Control Room HVAC System (CRHS)."

- Background Section (Page B3.7.11-1)
 - In the third paragraph, there are 3 occurrences (in lines 11, 14, and 15 of that paragraph) of the phrase "absorber." These should be corrected to read "adsorber."
 - Also in the third paragraph, there is a sentence that reads "Continuous operation of each ACU for at least 10 hours per months with the heaters on reduces moisture buildup on the HEPA filters and absorbers." The staff recommends deleting this

sentence since it is inconsistent with Surveillance Requirement (SR) 3.7.11.1 which states “Operate each CREACS division for ≥ 15 minutes with heaters operating” with a Frequency of every 31 days.

- Background Section (Page B3.7.11-2)
 - The first sentence of the fourth paragraph reads “The CRHS places the system into either of two separate of operation mode (emergency mode for protection for radiation, or recirculation mode for protection from smoke).” The sentence should read “The CRHS places the system into either of two separate operation modes (emergency mode for protection from radiation, or recirculation mode for protection from smoke).”
 - The fourth paragraph also contains the phrase “...isolated, closes exhaust dampers, and...” The phrase should read “...isolated, exhaust dampers are closed, and...”
 - The second sentence in the sixth paragraph contains the phrase “...the emergency radiation state as required.” The phrase should read “...the emergency mode as required.”
- Applicable Safety Analysis Section (Page B3.7.11-3)
 - The third paragraph contains the sentence “The analysis of hazardous chemicals releases demonstrates that the toxicity limits are not exceeded in the CRE following a hazardous chemical release (Reference 1).” This sentence should be enclosed in brackets (“[]”) since this a site specific evaluation that will be performed by a COL applicant utilizing the APR1400 design.
- LCO Section (Page B3.7.11-4)
 - The first sentence in the final paragraph of the LCO section contains the phrase “...individual will have to a method...” The phrase should read “...individual will have a method...”.
- Action Section (Page B3.7.11-5)
 - In the Actions for A.1, the second to last sentence in the paragraph ends with the phrase “...could result in less the CRHS function.” The phrase should read “...could result in loss of the CRHS function.”

These corrections are required to ensure the accuracy and completeness of the TS Bases.

Response

- Background Section (Page B3.7.11-1)

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- As stated in response to RAI 304-8361 Question 06.04-2, “absorber” used in the background section will be modified to “adsorber”.
 - As stated in response to RAI 304-8361 Question 06.04-2, the ACU operation time of “10 hours per month with heaters on” in the third paragraph will be modified to “15 minutes per month with heaters on” to be consistent with SR 3.7.11.
 - Background Section (Page B3.7.11-2)
 - As stated in the response to RAI 120-7977 Question 16-24-12, the first sentence of the fourth paragraph will be modified to “The CRHS places the system into the emergency mode for protection from radiation [or the toxic gas isolation mode for protection from toxic gas, depending on the initiation signal].” to include the toxic gas isolation mode as enclosed in brackets and to delete recirculation mode for protection from smoke since it is initiated manually and it is not required by NUREG-1432. KHNP will add “Actuation of” at the beginning of the first sentence in the fourth paragraph to be consistent with NUREG-1432.
 - The phrase “closes exhaust dampers” in the fourth paragraph will be modified to “exhaust isolation dampers are closed”.
 - As stated in the response to RAI 120-7977 Question 16-24-12, the phrase “the emergency radiation state as required” in the second sentence of the six paragraph will be modified to “the emergency mode [or the toxic gas isolation mode] as required”.
 - Applicable Safety Analysis Section (Page B3.7.11-3)
 - As stated in the response to RAI 120-7977 Question 16-24-12, the sentence “The analysis of hazardous chemicals releases demonstrates that the toxicity limits are not exceeded in the CRE following a hazardous chemical release (Reference 1).” in the third paragraph will be modified to be enclosed in brackets.
 - LCO Section (Page B3.7.11-4)
 - The phrase “individual will have to a method” in the first sentence in the final paragraph will be modified to “individual will have a method”.
 - Action Section (Page B3.7.11-5)
 - As stated in the response to RAI 120-7977 Question 16-24-9, the phrase “could result in less the” in the second to last sentence in the paragraph will be revised to “could result in loss of the”.
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Impact on DCD

Same as changes described in Impact on Technical Specifications section

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

The Bases for 3.7.11 will be revised as indicated in the attachment.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical, or Environmental Report.

BASES

BACKGROUND (continued)

The OPERABILITY of the CRE boundary must be maintained to ensure that the inleakage of unfiltered air into the CRE will not exceed the inleakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to CRE occupants.

The CRE and its boundary are defined in the Control Room Envelope Habitability Program.

The CRHS operation to maintain the control room temperature is discussed in DCD Tier 2, Subsection 9.4.1 (Reference 2). Upon receipt of the actuating signal(s), normal makeup air supply to the AHU is isolated, and the stream of ventilation air is recirculated through the filter trains of the CREACS.

Actuation of the



~~The~~ CRHS places the system into either of two separate of operation mode (emergency mode for protection for radiation, or recirculation mode for protection from smoke). Upon receipt of actuation signal of the emergency mode of operation, the unfiltered normal makeup air path is isolated, ~~closes exhaust dampers~~, and CREACS of the operating division is automatically started. The emergency mode initiates pressurization and filtered ventilation of the air supply to the CRE.

exhaust isolation dampers are closed



Outside air is filtered, and then added to the air being recirculated from the CRE. Pressurization of the CRE minimizes infiltration of unfiltered air through the CRE boundary from all the surrounding areas adjacent to the CRE boundary.

The air entering the CRE is continuously monitored by radiation detectors. One detector output above the setpoint causes actuation of the emergency radiation state as required.

The CRHS operating at a flow rate of 6,286 cmh (3,700 cfm) pressurizes the control room to about 3.175 mm (0.125 in) water gauge relative to external areas adjacent to the CRE boundary. The CRHS operation in maintaining the CRE habitable is discussed in DCD Tier 2, Section 6.4 (Reference 1).

Normally open isolation dampers are arranged in series pairs so that the failure of one damper to shut will not result in a breach of isolation. The CRHS is designed in accordance with seismic Category I requirements.

BASES

LCO (continued)

Each CREACS division is considered OPERABLE when the individual components necessary to limit CRE occupant exposure are OPERABLE. A CREACS division is considered OPERABLE when the associated:

- a. Fan is OPERABLE.
- b. HEPA filter and carbon absorber are not excessively restricting flow and are capable of performing their filtration functions.
- c. Heater, moisture separator, ductwork, and dampers are OPERABLE and air circulation can be maintained.

In order for the CREACS divisions to be considered OPERABLE, the CRE boundary must be maintained such that the CRE occupant dose from a large radioactive release does not exceed the calculated dose in the licensing basis consequence analyses for DBAs, and that CRE occupants are protected from hazardous chemicals and smoke.

The LCO is modified by a Note allowing the CRE boundary to be opened intermittently under administrative controls. This Note only applies to openings in the CRE boundary that can be rapidly restored to the design condition, such as doors, hatches, floor plugs, and access panels. For entry and exit through doors, the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls should be proceduralized and consist of stationing a dedicated individual at the opening who is in continuous communication with the operators in the CRE.

"Deleted"



This individual will have ~~to~~ a method to rapidly close the opening and to restore the CRE boundary to a condition equivalent to the design condition when a need for CRE isolation indicated.

APPLICABILITY

In MODES 1, 2, 3, 4, 5, and 6 and during movement of irradiated fuel assemblies, the CRHS must be OPERABLE to ensure that the CRE will remain habitable during and following a DBA and ensure that the control room temperature will not exceed equipment operational requirements following isolation of the control room.

During movement of irradiated fuel, the CRHS must be OPERABLE to cope with the release from a fuel handling accident.