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.:	**509-8591**
SRP Section:	**16 – Technical Specifications**
Application Section:	**16.3.8.1, 16.3.8.2**
Date of RAI Issue:	**08/01/2016**

Question No. 16-214

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.

Correct the wording used in various statements within Technical Specifications (TS) 3.8.1 and 3.8.2, and perform a global check as necessary.

Many times, the phrase “EDG(s) on one division” is used when it should be “EDG(s) in one division”. These corrections should be made in the following places at a minimum (the applicant is requested to perform a global check of the TS and Bases to ensure all corrections are made):

- TS 3.8.1
    - Condition B statement
    - Condition D (2nd statement)

- Condition E statement
- Required Action E.1
- Condition H statement

- TS 3.8.2
  - Condition B statement

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

Response

To ensure the completeness and accuracy of the Technical Specifications (TS) and Bases, the incorrect wording used in various statements within DCD Tier 2, Chapter 16, TS 3.8.1, 3.8.2, 3.8.4, 3.8.5, and 3.8.6 will be corrected as shown in the attachment.

A global check on terminology related to “EDG(s) on”, “batteries on” and “charger(s) on” was performed and was corrected for the Technical Specifications listed above.

Impact on DCD

Same as changes described in Impact on Technical Specification section.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

DCD Tier 2, Chapter 16, TS 3.8.1, 3.8.2, 3.8.4, 3.8.5, and 3.8.6 will be revised as shown in the attachment.

Impact on Technical/Topical/Environmental Reports

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or two EDGs ~~on~~ in one division inoperable.	B.1 Perform SR 3.8.1.1 for the OPERABLE offsite circuit(s).	1 hour AND Once per 8 hours thereafter
	AND 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)
	AND B.3.1 Determine OPERABLE EDG(s) is not inoperable due to common cause failure.	24 hours
	OR B.3.2 Perform SR 3.8.1.2 for OPERABLE EDG(s).	24 hours
	AND B.4 Restore EDG(s) to OPERABLE status.	72 hours
C. Two offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of Condition C concurrent with inoperability of redundant required features
	AND C.2 Restore one offsite circuit to OPERABLE status.	24 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One offsite circuit inoperable. AND One or two EDGs ~~on~~ in one division inoperable.	---------- NOTE ---------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems – Operating," when Condition D is entered with no AC power source to one division. ---------- D.1 Restore offsite circuits to OPERABLE status. OR D.2 Restore EDG(s) to OPERABLE status.	 12 hours 12 hours
E. One or two EDGs ~~on~~ in each division inoperable.	E.1 Restore EDG(s) ~~on~~ in one division to OPERABLE status.	2 hours
F. One automatic load sequencer inoperable.	F.1 Restore automatic load sequencer to OPERABLE status.	12 hours
G. Required Actions and associated Completion Times of Conditions A, B, C, D, E, or F not met.	G.1 Be in MODE 3. AND G.2 Be in MODE 5.	6 hours 36 hours
H. Two offsite circuits and one or more EDGs inoperable. OR One offsite circuit and one or two EDGs ~~on~~ in each division inoperable	H.1 Enter LCO 3.0.3.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.2 Suspend operations involving positive reactivity additions that could result in a loss of required SDM or boron concentration. AND A.2.3 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately Immediately
B. One or two required EDGs ~~on~~ in one division inoperable.	B.1 Suspend movement of irradiated fuel assemblies AND B.2 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration AND B.3 Initiate action to restore required EDG(s) to OPERABLE status	Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.2.1	NOTE The following SRs are not required to be performed: SR 3.8.1.3, SR 3.8.1.9 through SR 3.8.1.11, SR 3.8.1.13 through SR 3.8.1.16, and SR 3.8.1.18.	
	For AC sources required to be OPERABLE, the SRs of Specification 3.8.1, "AC Sources – Operating," except SR 3.8.1.8, SR 3.8.1.12, SR 3.8.1.17, SR 3.8.1.19, and SR 3.8.1.20 are applicable.	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources – Operating

LCO 3.8.4 The Division I and Division II DC electrical power systems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two battery charger(s) ~~on~~ in one division inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND A.2 Verify battery float current ≤ 2 amps. AND A.3 Restore battery charger(s) to OPERABLE status.	2 hours Once per 12 hours 72 hours
B. One or two batteries ~~on~~ in one division inoperable.	B.1 Restore batter(y)(ies) to OPERABLE status.	2 hours
C. One DC electrical power system division inoperable for reasons other than Condition A or B.	C.1 Restore DC electrical power subsystem to OPERABLE status.	2 hours
D. Required Action and Associated Completion Time not met.	D.1 Be in MODE 3. ~~OR~~ AND D.2 Be in MODE 5.	6 hours 36 hours

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources – Shutdown

LCO 3.8.5 DC electrical power system division shall be OPERABLE to support the DC electrical power distribution system division(s) required by LCO 3.8.10, “Distribution Systems – Shutdown.”

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

NOTE

LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two battery chargers ~~on~~ in one division inoperable. AND indent The redundant division batteries and chargers OPERABLE.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND A.2 Verify battery float current ≤ 2 amps. AND A.3 Restore battery charger to OPERABLE status.	2 hours Once per 12 hours 72 hours

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Cell Parameters

LCO 3.8.6 Battery cell parameters for the Division I and Division II batteries shall be within limits.

APPLICABILITY: When associated DC electrical power system divisions are required to be OPERABLE.

ACTIONS

NOTE

Separate Condition entry is allowed for each battery.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or two batteries ~~on~~ in one division with one or more battery cells float voltage < 2.07 V.	A.1 Perform SR 3.8.4.1. AND A.2 Perform SR 3.8.6.1. AND A.3 Restore affected cell voltage ≥ 2.07 V.	2 hours 2 hours 24 hours
B. One or two batteries ~~on~~ in one division with float current > 2 amps.	B.1 Perform SR 3.8.4.1. AND B.2 Restore battery float current to ≤ 2 amps.	2 hours 12 hours

ACTION (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. NOTE Required Action C.2 shall be completed if electrolyte level ~~is~~ below the top of plates. One or two batteries ~~on~~ one division with one or more cells electrolyte level less than minimum established design limits.	NOTE Required Actions C.1 and C.2 are only applicable if electrolyte level ~~is~~ below the top of plates. C.1 Restore electrolyte level to above the top of plates. ~~OR~~ C.2 Verify no evidence of leakage. AND C.3 Restore electrolyte level to greater than or equal to minimum established design limits.	8 hours 12 hours 31 days
D. One or two batteries ~~on~~ one division with pilot cell electrolyte temperature less than minimum established design limits.	D.1 Restore battery pilot cell temperature to greater than or equal to minimum established design limits.	12 hours
E. One or more batteries in redundant division with battery parameters not within limits.	E.1 Restore battery parameters for batteries in one division to within limits.	2 hours
F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met. OR One or two batteries ~~on~~ one division with one or more battery cells float voltage < 2.07 V and float current > 2 amps.	F.1 Declare associated battery inoperable.	Immediately

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Question No. 16-215

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.

Correct a formatting error in the Surveillance Requirements (SR) within Technical Specification (TS) 3.1.8.

On page 3.8.1-4, the single lines that separates SR’s 3.8.1.1 and 3.8.1.2 and SR’s 3.8.1.3 and 3.8.1.4 don’t appear to be a straight line towards the left hand side of the page.

This correction is required to ensure the correct formatting of single lines.

Response

The formatting error in the Surveillance Requirements (SR) within Technical Specification (TS) 3.8.1 will be corrected as shown in the attachment.

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

DCD Tier 2, Chapter 16, TS 3.8.1 will be revised as shown in the attachment.

Impact on Technical/Topical/Environmental Reports

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

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each offsite circuit.	7 days
SR 3.8.1.2	NOTE 1. All EDG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 2. A modified EDG start, involving idling and gradual acceleration to synchronous speed, may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met. Verify each EDG starts from standby conditions and achieves steady state voltage ≥ 3,744 V and ≤ 4,576 V, and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	31 days
SR 3.8.1.3	NOTE 1. EDG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one EDG at a time. 4. This SR shall be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.2 or SR 3.8.1.7. Verify each EDG is synchronized and loaded, and operates for ≥ 60 minutes at a load ≥ 90 % rating and ≤ 100 % rating.	31 days
SR 3.8.1.4	Verify each day tank contains ≥ 2,404 L (635 gal) of fuel oil.	31 days

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Question No. 16-216

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.

Correct a formatting error in Surveillance Requirement (SR) 3.8.1.9.

The SR contains a statement followed by a list of three items. A line break needs to be inserted between the text of the SR and the first item “a.”

This correction is required to ensure the correct formatting of SR 3.8.1.9.

Response

The formatting error in the Surveillance Requirements (SR) within Technical Specification (TS) 3.8.1.9 will be corrected as shown in the attachment.

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

DCD Tier 2, Chapter 16, TS 3.8.1 will be revised as shown in the attachment.

Impact on Technical/Topical/Environmental Reports

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

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.8	---------- NOTE ---------- [This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events which satisfy this SR.] ---------- Verify automatic and manual transfer of AC power sources from the normal offsite circuit to each alternate offsite circuit.	18 months
SR 3.8.1.9	---------- NOTE ---------- 1. [This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.] 2. [If performed with the EDG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition, the power factor shall be maintained as close to the limit as practicable.] ---------- Verify each EDG rejects a load greater than or equal to its associated single largest post-accident load and: a. Following load rejection, the frequency is ≤ 63 Hz, b. Within 3 seconds following load rejection, the voltage is ≥ 3,744 V and ≤ 4,576 V, and c. Within 3 seconds following load rejection, the frequency is ≥ 58.8 Hz and ≤ 61.2 Hz.	18 months

(line break)