

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.: 439-8524
 SRP Section: 16 – Technical Specifications
 Application Section: 16.1.1, 16.3.0, 16.3.1, 16.3.3.13
 Date of RAI Issue: 03/11/2016

Question No. 16-124

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.

The applicant is requested to rephrase SR 3.1.54.5 so that its meaning is clearer and consistent with the Bases, as follows: "Verify each full strength CEA drop time ~~from the fully withdrawn position to the~~ at 90 % insertion ~~position~~ position is ≤ 4 seconds."

Regarding SR 3.1.54.5, the Deviation Report states: "This SR confirms the required CEA drop time assumed in the safety analysis." This CEA drop time is in Figure 4.2-14 of DCD Tier2. The applicant is requested to add FSAR Section 4.2 as a reference in the Bases for Subsection 3.1.4.

Regarding the Bases for SR 3.1.54.5, second paragraph, suggest revising the first sentence to reflect that 4 seconds is the upper limit for an operable CEA drop time, as follows: "The 4 second CEA drop time is the maximum time ~~it takes~~ allowed for a fully withdrawn individual full strength CEA to reach its 90% insertion position when electrical power is interrupted to the CEA drive mechanism with RCS T_{cold} greater than or equal to [286.7 °C (548 °F)] and all reactor coolant pumps operating." Also, do the square brackets around the temperature criterion imply

this is a COL Action Item?

Response

For consistency with the associated Bases, SR 3.1.~~5~~4.5 will be changed from “Verify each full strength CEA drop time at 90% inserted position \leq 4 seconds” to “Verify each full strength CEA drop time from the fully withdrawn position to the 90% insertion position is \leq 4 seconds.”

Since the drop times are taken from Figure 4.2-14 of DCD Tier 2 and are used for safety analysis in DCD Tier 2 Section 15.0.0.2.4, Section 4.2 and 15.0 will be added as references in the Bases for Subsection 3.1.~~5~~4.

In the Bases for SR 3.1.~~5~~4.5 that discusses the 4 second CEA drop time, the words “it takes” will be changed to “allowed” to change the connotation from an experienced based statement to a requirement based statement.

The temperature criterion is estimated by considering the two values; RCS cold leg temperature used for the safety analysis in Section 15.0 and temperature uncertainty. Since temperature uncertainty will be analyzed later by the COL applicant, the temperature criterion is bracketed as a COL Item.

Due to the deletion of LCO 3.1.2 by the response to RAI 189-8057 Q16-59, the numbering of SR 3.1.~~5~~ is changed to SR 3.1.4.

Impact on DCD

There is no impact on DCD.

Impact on PRA

There is no impact on PRA.

Impact on Technical Specifications

SR 3.1.5.5 and Bases for SR 3.1.5.5 will be revised as indicated in the attachment.

Impact on Technical/Topical/Environmental Report

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify indicated position of each full and part strength CEA is within 16.8 cm (6.6 in) of all other CEAs in its group.	12 hours
SR 3.1.5.2	Verify that, for each CEA, its OPERABLE CEA position indicator channels indicate within 13.2 cm (5.2 in) of each other.	12 hours
SR 3.1.5.3	Verify full strength CEA freedom of movement (trippability) by moving each individual full strength CEA that is not fully inserted in the core at least 12.7 cm (5 in).	92 days
SR 3.1.5.4	Perform a CHANNEL FUNCTIONAL TEST of each reed switch position transmitter (RSPT) channel.	18 months
SR 3.1.5.5	Verify each full strength CEA drop time at 90 % inserted position ≤ 4 seconds.	Prior to reactor criticality, after each removal of the reactor head

from the fully withdrawn position to the 90% insertion

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.5.4

Performance of a CHANNEL FUNCTIONAL TEST of each reed switch position transmitter (RSPT) channel ensures the channel is OPERABLE and capable of indicating CEA position. Since this test must be performed when the reactor is shut down, an 18-month Frequency to be coincident with refueling outage was selected. Operating experience has shown that these components usually pass this Surveillance when performed at a Frequency of once every 18 months.

SR 3.1.5.5

Verification of full strength CEA drop times determines that the maximum CEA drop time permitted is consistent with the assumed drop time used in the safety analysis (Reference 3). Measuring drop times prior to reactor criticality, after reactor vessel head removal, ensures the reactor internals and CEDM will not interfere with CEA motion or drop time and that no degradation in these systems has occurred that would adversely affect CEA motion or drop time. Individual CEAs whose drop times are greater than safety analysis assumptions are not OPERABLE. This SR is performed prior to criticality due to the plant conditions needed to perform the SR and the potential for an unplanned plant transient if the Surveillance were performed with the reactor at power.

 T_{cold}

allowed

(References 4&5)

The 4 second CEA drop time is the maximum time it takes for a fully withdrawn individual full strength CEA to reach its 90% insertion position when electrical power is interrupted to the CEA drive mechanism with RCS T_{cold} greater than or equal to [286.7 °C (548 °F)] and all reactor coolant pumps operating. The CEA drop time of full strength CEAs shall also be demonstrated through measurement prior to reactor criticality for specifically affected individual CEAs following any maintenance on or modification to the CEA drive system which could affect the drop time of those specific CEAs.

REFERENCES

1. 10 CFR Part 50, Appendix A, GDC 10 and 26.
2. 10 CFR 50.46.
3. DCD Tier 2, Section 15.4.

4. DCD Tier 2, Section 4.2.
5. DCD Tier 2, Section 15.0.