
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.: 471-8581

SRP Section: 09.05.03 – Lighting Systems

Application Section:

Date of RAI Issue: 04/26/2016

Question No. 09.05.03-16

In response to RAI 8466, Question 09.05.03-13, the applicant states: “The term “safety-related areas” applies to areas containing equipment or structures required for safe shutdown (including accident mitigation). For more details, refer to DCD Tier 2, Table 3.2-1, note No. (1).” Table 3.2-1 shows that lighting equipment in safety-related areas are seismic category II, and lighting equipment in other areas is seismic category III. The applicant stated in response to RAI 8237, Question 09.05.03-7, that the seismic category II requirements are “not to impact safety-related equipment when subjected to seismic loading of a safe shutdown earthquake [SSE].”

- a. Since the term “safety-related areas” is specific to the APR1400 DCD, please revise Section 9.5.3.3 the DCD Tier 2 to incorporate the above clarification.
- b. Based on the applicant’s definition of safety-related area, the EDG building and the remote shutdown room (RSR) are “safety-related areas” since these areas contain equipment required for safe shutdown. In addition, there are safety related equipment in the EDG building and the RSR (class 1E switch per Table 3.2-1 (58 of 86)). However, per Table 3.2-1 (39 of 86), lighting equipment/fixtures in both the EDG building and the RSR are classified as seismic category III, contrary to the definition of “safety-related areas” which would classify the lighting in these areas as seismic Category II. Since lighting equipment located in the EDG building and the RSR may impact safety-related equipment in their vicinities when subject to seismic loading of an SSE, explain why lighting equipment in the EDG building and the RSR are not classified as seismic category II. Please revise the DCD with the correct information if necessary.
- c. Table 3.2-1 (39 of 86) indicated that lighting equipment classified as seismic category II is located in safety-related areas, consisting of the main control room, fuel handling area, reactor containment building, auxiliary building, component cooling water heat exchanger building, and essential service water building. Please confirm that lighting equipment in all safety-related areas is classified as seismic category II.

Response

The following provides a response to each item of the staff's request above.

- a. DCD Tier 2, Subsection 9.5.3.3 will be revised to incorporate the clarification.
 - b. Lighting equipment in the EDG building and the RSR meets seismic Category II requirements. DCD Tier 2, Table 3.2-1 (39 of 86) will be revised to incorporate the correct information.
 - c. The lighting equipment in all safety-related areas meets seismic Category II requirements.
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Impact on DCD

DCD Tier 2, Table 3.2-1 (39 of 86) and Subsection 9.5.3.3 will be revised as shown in the Attachment.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

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

APR1400 DCD TIER 2

RCB, AB,
CCWHXB, ESWB,
EDGB

, EDGB

Table 3.2-1 (39 of 86)

Add

Item No. / Principal SSCs	Location ⁽²⁾	Safety Class	Quality Group	Codes and Standards	10 CFR 50, App. B ⁽³⁾	Seismic Category	Remarks
53. LL – Lighting							
a. Equipment in safety-related area							
1) Lighting fixture	MCR, FHA, RCB	NNS	N/A	NFPA 101-2009	A	II	(3)(d)
2) Lighting transformer	RCB, AB, CCWHXB, ESWB	NNS	N/A	NFPA 101-2009	A	II	(3)(d)
3) Lighting distribution panel	RCB, AB, CCWHXB, ESWB	NNS	N/A	NFPA 101-2009	A	II	(3)(d)
b. Equipment in other areas	ALL	NNS	N/A	N/A	N/A	III	
54. LP – Large Display Panel	AB	NNS	N/A	N/A	A	II	(3)(d)
55. MP – Main Power							
a. Protective relays for generator and transformer	AB	NNS	N/A	N/A	A	II	(3)(d)
b. Generator excitation system, main transformer, generator circuit breaker, isolated phase bus and related protection facility	TGB Yard	NNS	N/A	N/A	N/A	III	
c. Others	TGB	NNS	N/A	N/A	N/A	III	

APR1400 DCD TIER 2

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- d. For firefighting, the self-contained battery lightings provide emergency lighting for safe movement of the personnel to the access and egress routes.
- e. ~~The self-contained battery lightings located in Class 1E equipment areas meet seismic Category I requirements. The self-contained battery lightings located in all other areas meet seismic Category II requirements.~~
- f. The emergency ac lighting powered from the Class 1E sources is classified as non-

The lighting system equipment located in safety-related areas, whose details are described in DCD Tier 2, Table 3.2-1, note No. (1), meets seismic Category II requirements not to impact safety-related equipment when subjected to seismic loading of a safe shutdown earthquake. Lighting system equipment in other areas is classified as seismic Category III.
- g. Lamps with mercury content are not to be installed in the fuel handling areas and inside the containment.

9.5.3.4 Inspection and Testing Requirements

The lighting system is inspected and tested prior to plant operation. Preoperational testing on the lighting systems is performed during initial startup as described in Subsections 14.2.12.1.80 and 14.2.12.1.81.

The normal lighting circuits are normally energized and require no periodic testing. The emergency lighting is inspected and tested periodically.

9.5.3.5 Instrumentation Requirements

There is no specific instrumentation associated with the lighting systems.

9.5.4 Emergency Diesel Engine Fuel Oil System

The emergency diesel engine fuel oil system (EDEFOS) provides for the required storage capacity and continuous supply of fuel oil to each of the four Class 1E emergency diesel generators (EDGs) to safely shut down the plant and maintain a safe shutdown condition following a design basis accident (DBA) concurrent with a loss of offsite power (LOOP) by supplying power to essential loads. Diesel fuel for each emergency diesel generator is supplied by fuel oil transfer pumps from a fuel oil storage tank to a fuel day tank.