
REVISED 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.: 280-8220
SRP Section: 14.02 – Initial Plant Test Program – Design Certification and New License Applicants
Application Section:
Date of RAI Issue: 11/02/2015

Question No. 14.02-44

GDC 17 requires that onsite and offsite power systems provide sufficient capacity and capability and furthermore, GDC 18 requires the testing of electric power systems.

DCD Tier 2 Section 14.2.12.1.80 discusses the normal lighting system test. Please discuss how this test verifies that required electrical power supplies and control circuits are available or provide adequate justification that it is not needed. Please confirm that when testing normal lighting systems that other lighting systems will be de-energized in the rooms.

Response

KHNP has reviewed the subject question and understands the staff's request. KHNP is in the process of upgrading the test plans presented in Section 14.2 of the DCD. This effort is focused on adding additional SSCs that are important to safety and risk significant as well as increasing the level of detail described in the DCD for test prerequisites, test methods and acceptance criteria for the various tests. It has been determined that the actions to be taken as a result of this question is within the scope of the upgrade effort. Therefore, KHNP will address the noted items in the upgrade effort, which is scheduled to be completed by February 1, 2016. A revised response to this question that incorporates the results of the upgrade effort will be submitted to the NRC after completion.

Response – (Rev. 1)

For the normal lighting system test, the power sources for the lighting distribution panels are energized and the circuit breakers for the panels are closed. This testing configuration verifies that required electrical power supplies and control circuits are available.

Though an ITP has been developed for normal lighting and it is considered prudent to test the system, the normal lighting system is not important to safety and the requirements of GDC 17 and GDC 18 do not apply to the system.

DCD Tier 2, Subsection 14.2.12.1.80 will be revised to incorporate the clarification above.

The emergency ac lighting system (EDG backed) is always turned on and combines with the lighting supplied by non-safety power to provide adequate illumination levels that support operation and maintenance activities during normal plant operation. Therefore, when testing the normal lighting, only the emergency dc lighting fixtures are not turned on.

Impact on DCD

DCD Tier 2, Subsection 14.2.12.1.80 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 Environmental Report.

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5.3 The condensate storage tank makeup valves can be opened and closed automatically by their respective condensate storage tank level. Also, level alarms are operated by their respective tank level. Status is indicated.

5.4 System alarms operate per design.

14.2.12.1.80 Normal Lighting System Test1.0 ~~OBJECTIVE~~OBJECTIVES

1.1 To demonstrate that the normal lighting system provides adequate illumination for plant operations

2.0 PREREQUISITES

2.1 Construction activities on the normal lighting system ~~have been~~are completed.

2.2 Test instruments are properly calibrated and available.

3.0 TEST METHOD

3.1 Place the plant lighting in service and check that illumination levels are adequate.

3.2 Demonstrate that a single circuit failure does not cause the loss of all lighting in a room that requires normal access.

4.0 DATA REQUIRED

4.1 Illumination levels in designated areas

2.3 The normal lighting distribution panels are energized and required circuit breakers closed.
2.4 The emergency dc lighting fixtures are not turned on.

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Question No. 14.02-45

GDC 17 requires that onsite and offsite power systems provide sufficient capacity and capability and furthermore, GDC 18 requires the testing of electric power systems.

DCD Tier 2 Section 14.2.12.1.81 discusses the emergency lighting system test. Please confirm that the ability of the emergency lighting system is verified by simulating a loss of the normal lighting and observing that the emergency system automatically activates. Please discuss how this test verifies that required electrical power supplies and control circuits are available or provide adequate justification that it is not needed.

Response

KHNP has reviewed the subject question and understands the staff's request. KHNP is in the process of upgrading the test plans presented in Section 14.2 of the DCD. This effort is focused on adding additional SSCs that are important to safety and risk significant as well as increasing the level of detail described in the DCD for test prerequisites, test methods and acceptance criteria for the various tests. It has been determined that the actions to be taken as a result of this question is within the scope of the upgrade effort. Therefore, KHNP will address the noted items in the upgrade effort, which is scheduled to be completed by February 1, 2016. A revised response to this question that incorporates the results of the upgrade effort will be submitted to the NRC after completion.

Response - (Rev. 1)

The ability of emergency dc lighting system is verified by simulating a loss of the normal lighting and observing that the emergency dc lighting system automatically activates. The emergency ac lighting system is always turned on and combines with the normal lighting system to provided adequate illumination levels during normal plant operation. Therefore, a loss of the normal

lighting system causing an automatic activation is not simulated in the emergency ac lighting system test.

For the emergency lighting system test, the power sources for the lighting distribution panels are energized and the circuit breakers for the panels are closed as stated in DCD Tier 2, Subsection 14.2.12.1.81, Emergency Lighting System Test, 2.0 prerequisites. This test configuration verifies that required electrical power supplies and control circuits are available.

DCD Tier 2, Subsection 14.2.12.1.81 will be revised to incorporate the clarification above.

Impact on DCD

DCD Tier 2, Subsection 14.2.12.1.81 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 Environmental Report.

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5.0 ACCEPTANCE CRITERIA

- 5.1 The normal lighting system ~~operates as described in Subsection 9.5.3~~ provides its adequate illumination level for plant operations.

14.2.12.1.81 Emergency Lighting System Test1.0 ~~OBJECTIVE~~ OBJECTIVES

- 1.1 To demonstrate that the emergency lighting system provides adequate illumination to operate equipment during emergency operations

2.0 PREREQUISITES

- 2.1 Construction activities on the emergency lighting system ~~have been~~ are completed.

- 2.2 Test instruments are properly calibrated and available.

3.0 TEST METHODS

- 3.1 Demonstrate that the emergency lighting system provides adequate illumination as required in designated control areas.

- 3.2 Demonstrate that the emergency lighting system provides adequate illumination in other areas of the plant.

- 3.3 Demonstrate that the emergency lighting system comes on upon loss of normal lighting.



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- 3.4 Demonstrate that the battery-operated emergency lights provide adequate illumination at designated locations.

- 3.5 Demonstrate that the battery-operated emergency lights are capable of providing lighting for the designated amount of time.

2.3 The emergency lighting distribution panels are energized and required circuit breakers closed.