
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.: 281-8232
SRP Section: 14.02 – Initial Plant Test Program - Design Certification and New License Applicants
Application Section: 14.2
Date of RAI Issued: 11/02/2015

Question No. 14.02-48

Regulatory Guide 1.68, “Initial Test Programs for Water-Cooled Nuclear Power Plants,” provides guidance on initial tests that are acceptable to staff as part of the initial test program. Appendix A to Regulatory Guide 1.68 provides guidance on the types of tests that should be included as part of the initial test program. Section A-1.k. “Radiation Protection Systems” indicates that, “For radiation monitoring equipment that is used to perform automatic control functions, the tests should confirm, using established instrumentation set-points, that upon detecting elevated levels of radioactivity, the system initiates the proper automatic control features in ensuring the timely closures of isolation valves or dampers.”

FSAR Section 10.4.10, indicates that the auxiliary steam system is equipped with a radiation monitor which continuously checks for contamination and if the condensate is contaminated the monitor actuates an alarm in the main control room and automatically redirects the condensate to the liquid waste management system for treatment. However, there does not appear to be anything in the initial test program verifying that this monitor will automatically redirect the condensate to the liquid waste management system for treatment. In addition, in reviewing FSAR Chapters 11 and 12 it is unclear which monitor is performing this function.

1. Please update FSAR Section 14.2 to include a test to ensure that the monitor performs its function of automatically redirecting the condensate to the liquid waste management system.
2. Please specify which radiation monitor performs this function and update FSAR Chapters 11 and 12 to ensure it is clear which monitor performs this function.

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. 2)

1. KHNP will update the DCD Tier 2 Subsection 14.2.12.1.128 to include a specific objective to verify that proper system operation occurs on the detection of a radiation signal. Tests for the function of automatically redirecting the condensate to the liquid waste management system will be performed through verifying proper operation of designated components and operating control valves as described below in the Test Method section currently contained in Subsection 14.2.12.1.128.

3.0 TEST METHOD

- 3.1 Verify proper operation of designated components such as protective devices, controls, interlocks, instrumentation, and alarms, using actual or simulated inputs.
- 3.2 Operate control valves from all appropriate control positions. Observe valve operation and position indication and measure opening and closing times.

The following acceptance criteria will be added to Subsection 14.2.12.1.128:

- 5.3 The auxiliary steam system performs as described in Subsection 10.4.10.

A description of the function of automatically redirecting the condensate to the liquid waste management system is provided in Subsection 10.4.10.5.

KHNP will also revise Objective 1.4 to delete demonstration of system alarms since Objective 1.6 specifies that same objective and 1.4 appears to be redundant.

2. Subsections 11.5.2.3.5.d and 11.5.2.3.5.e have been revised to state that Condensate polishing area sump water monitor (RE-164) and Condenser pit sump water monitor (RE-165) perform the function of automatically diverting the condensate to the liquid radwaste management system. The markups of Subsections 11.5.2.3.5.d and 11.5.2.3.5.e were included in the revised response to RAI 132-8088 Question 11.05-2. (ref. MKD/NW-16-0481L dated May 12, 2016).

Impact on DCD

The revised DCD Tier 2, Subsection 14.2.12.1.128 submitted by KHNP Letter No. MKD/NW-16-0156L, dated February 24, 2016 will be revised as indicated in the Attachment associated with this response.

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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3.4 Verify the proper operation and installation of all peak recording accelerographs.

4.0 DATA REQUIRED

4.1 Recorded sensor response to simulated seismic inputs

5.0 ACCEPTANCE CRITERIA

5.1 The seismic monitoring instrumentation system operates as designed and described in ~~Subsection~~subsection 3.7.4.

14.2.12.1.128 Auxiliary Steam System Test1.0 ~~OBJECTIVE~~OBJECTIVES

1.1 To demonstrate the auxiliary steam system provides the steam to various plant components at designed pressures and flow

1.2 Demonstrate the manual and automatic operation of system pumps

1.3 Demonstrate the manual and automatic operation of system valves

1.4 Demonstrate all status lights and system alarms

← Delete

1.5 Demonstrate the fail positions of system valves

1.6 Demonstrate all system alarms

↖ 1.7 To demonstrate system responses to PR-RE/RT-103 signal

2.0 PREREQUISITES

2.1 Construction activities on the auxiliary steam system have been completed.

2.2 Auxiliary steam system instrumentation has been calibrated.

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- 4.3 Valve position indication
- 4.4 Response of power-operated valves to loss of motive power
- 4.5 Setpoints at which alarms and interlocks occur
- 4.6 Pump operating data

5.0 ACCEPTANCE CRITERIA

- 5.1 The auxiliary steam system provides steam flow to designated components and systems.
- 5.2 The auxiliary steam ~~boiler~~system meets manufacturers design performance.

14.2.12.1.129 Containment Isolation Valves Test

5.3 The auxiliary steam system performs as described in Subsection 10.4.10

1.0 ~~OBJECTIVE~~OBJECTIVES

- 1.1 To demonstrate that containment isolation valves can be operated manually and operate in response to automatic actuation
- 1.2 To verify that upon loss of actuating power, the valves fail as designed
- 1.3 To verify that all valves operate in less than the time specified in the valve test procedure

2.0 PREREQUISITES

- 2.1 Construction activities on the containment isolation valves have been completed.
- 2.2 Support system required to operate the containment isolation valves are operable.