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.:	**198-8208**
SRP Section:	**14.2.12.2.9 – Post-Core Instrument Correlation**
Application Section:	**14.2.12.2.9**
Date of RAI Issue:	**09/04/2015**

Question No. 14.02-34

Demonstrate how the test objective of the Post-Core Instrument Correlation Test stated APR1400 FSAR Tier 2, Section 14.2.12.2.9 can be accomplished with the test methods described in this section.

Criterion XI, “Test Control,” of Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,” to 10 CFR Part 50 states, in part, that a test program shall be established to assure that all testing required to demonstrate that SSCs will perform satisfactorily in service is identified and performed in accordance with written test procedures, which incorporate the requirements and acceptance limits contained in applicable design requirements. RG 1.68, “Initial Test Programs for Nuclear Power Plants” provides guidance on the initial test program.

APR1400 FSAR Tier 2, Section 14.2.12.2.9 provides the post-core instrument correlation test. The test objective states, “To demonstrate proper operation of the plant protection system (PPS), core protection calculators (CPCs), information processing system (IPS), and qualified indication and alarm system (QIAS).” However, the test methods only require the PPS, CP, IPS and QIAS readouts and the main control room instrument readings to be obtained. It does not appear that these test methods will demonstrate the proper operation of the PPS, CPC, IPS, and QIAS. In addition, the acceptance criteria for this test states, “The IPS, QIAS, PPS, and CPCs perform as described in Sections 7.2 and 7.7.” Sections 7.2 and 7.7 of the APR1400 FSAR Tier 2 contain a significant amount of design descriptions for these systems. It is unclear what specific design criteria need to be met for these systems with this test. As such, the staff requests the applicant to identify the specific acceptance criteria that need to be met with this test.

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)

The purpose of the Post-Core Instrument Correlation is to verify that the as-installed instrumentation is functional for specific I&C systems. Therefore, the objective in Section 14.2.12.2.9 will be modified to align with the purpose of the test.

The prerequisites for the Post-Core Instrument Correlation test are that PPS, CPCs, IPS, QIAS and COLSS are in operation, proper operation of those systems is demonstrated through the preoperational tests specified in the APR1400 FSAR Tier 2, Sections 14.2.12.1.24 for PPS, 14.2.12.1.31 for COLSS, 14.2.12.1.44 for IPS and QIAS, 14.2.12.1.138 for CPCs.

For the Post-Core Instrument Correlation test, the function of the instrumentation is verified by simultaneously comparing the process variables which are displayed on those systems to the PCIC. The acceptance criteria of this test is the normal operation of those systems as described in Sections 7.2 and 7.7. Any abnormal operation which results in a display discrepancy between systems of the process variables listed in the revised ITP (ref. KHNP submittal MKD/NW-16-0156L dated February 24, 2016; ML16056A003), will be checked and corrected.

Impact on DCD

DCD Tier 2 Section 14.2.12.2.9 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 and Environmental Report.

4.0 DATA REQUIRED

4.1 Resistance measurements

5.0 ACCEPTANCE CRITERIA

5.1 Insulation resistance of the in-core neutron flux detectors is as described in manufacturer's recommendations.

5.2 Each of test item listed below shall be satisfied.

- Rhodium detector raw signal quality
- Background detector raw signal quality
- Rhodium detector charge quality
- Rhodium detector sensitivity quality
- Compensated/uncompensated neutron flux quality

14.2.12.2.9 Post-Core Instrument Correlation

1.0 ~~OBJECTIVE~~OBJECTIVES

To verify the installed instrumentation is functional for

1.1 ~~To demonstrate the proper operation of~~ the plant protection system (PPS), core protection calculators (CPCs), information processing system (IPS), and qualified indication and alarm system (QIAS).

2.0 PREREQUISITES

2.1 PPS, CPCs are in operation.

2.2 IPS, QIAS, and core operating limit supervisory system (COLSS) are in operation.