

## 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.: 233-8244  
SRP Section: 05.02.02 – Overpressure Protection  
Application Section: 5.2.2  
Date of RAI Issue: 10/02/2015

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### **Question No. 05.02.02-5**

GDC 30 requires that the reactor coolant pressure boundary be designed, fabricated, erected and tested to the highest quality standards practical. Application of GDC 30 to overpressure protection system provides assurance that the reactor coolant pressure boundary will have an extremely low probability of failure because of manufacturing or design defects. As indicated in NUREG-0800, Section 5.2.2, SRP Acceptance Criteria 5, states that the performance of tests and inspections should occur before operation and during startup to functionally demonstrate that the over pressure protection system, as installed, meets all design requirements.

DCD Section 5.2.2.10, "Testing and Inspection," describes testing and inspection applied to the pressurizer POSRV's and main steam safety valves(MSSVs) providing a list of verification testing to be performed for operability of the pressurizer POSRVs. DCD Section 5.2.2.10 further references DCD Chapter 14 for specifying preservice testing. DCD Tier 2, Section 14.2.12.1.3, "Pressurizer Pilot Operated Safety Relief Valve Test," contains POSRV tests to verify the open/closing pressure and opening response time. Compared to Chapter 14, the Section 5.2.10 verification testing seems to contain additional pre-service testing (setpoint, response time, leak test, position indicator, closing time, etc...).

In addition, DCD Tier 2, Section 14.2.12.1.3 contains a reference to Section 5.4.14, "Safety and Relief Valves." for performance acceptance criteria, but much of the performance description is located in Section 5.2.2 of DCD.

The staff requests applicant to define the complete preservice testing to be performed on the POSRVs and update the DCD accordingly.

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**Response – (Rev.1)**

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 including POSRV tests. It has been determined that the action 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 January 18, 2016.

Since DCD Tier2, Section 14.2.12.1.3 does not define the complete preservice testing to be performed on the POSRVs, its entire description was included in the revised DCD Ch.14 which was submitted in February 2016. The related details can be referenced through it. Additional revision is in the attachment.

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**Impact on DCD**

DCD Tier 2, Section 14.2.12.1.3 will be revised as indicated in the attachment to 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 Environment Report.

**APR1400 DCD TIER 2**

## 2.0 PREREQUISITES

RAI 233-8244 - Question 05.02.02-5\_Rev.1

- 2.1 Construction activities on the pressurizer have been completed and all associated instrumentation has been checked and calibrated.
- 2.2 RCS is at vendor-recommended condition for valve testing.
- 2.3 Field testing device with associated support equipment and calibration data are available.

## 3.0 TEST METHOD

- 3.1 Using the field testing device, manipulate the operating pressure on the POSRV pilot valve until the POSRV starts to open.

3.3 Determine opening dead times, stroke times and closing times.

- 3.2 Determine opening/closing pressure from the field testing device correlation data.

~~3.3 Determine opening dead time and opening stroke times and closing time.~~

- 3.4 Adjust valve opening/closing characteristics if necessary and retest.

## 4.0 DATA REQUIRED

- 4.1 Pressurizer pressure and temperature

4.3 Opening dead times, stroke times and closing times.

- 4.2 Pressure applied to the field testing device to lift the POSRV off its seat

~~4.3 Opening dead time and opening stroke times and closing time~~

4.4 Leak detection temperatures

## 5.0 ACCEPTANCE CRITERIA

- 5.1 POSRVs perform as described in Subsection 5.4.14.