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## 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.: 218-8183  
SRP Section: 11.02 – Liquid Waste Management System  
Application Section: 11.2  
Date of RAI Issue: 09/21/2015

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### **Question No. 11.02-4**

In the description of the Inspection, Test Analysis for the following design commitments in Table 2.7.6.1-2 the applicant states the following:

In design commitment 2 the applicant states “Test of the as-built LWMS discharge valves will be performed using a simulated test signal.”

In design commitment 4, the applicant states: “Tests of the radiation monitor alarm signal will be performed to verify that signal is annunciated in the MCR and radwaste control room using simulated test signals at the required setpoint.”

In design commitment 6, the applicant states: “...and signal tests will be conducted to verify alarm, pump shut-off, and valve closure.

In review of “simulated test signal” and “simulated tests,” the NRC staff believes that this implies that an electric signal will be used in place of a radiation source. NRC staff finds that this method does not test the system as a whole as it does not functionally test the radiation detector which is an essential component. Testing of this component is essential in verifying information that would be used to justify compliance with 10 CFR 50 Appendix I Dose Objectives, 10 CFR 20 Appendix B Table 2 limits, and 10 CFR 20.1301 and 1302 dose limits to a member of the public.

NRC staff requests that the applicant address the use of a radiation source in testing the LWMS in place of the currently cited simulated test signal.

### **Response – (Rev. 2)**

The liquid radwaste system effluent radiation monitors, PR-RE-183/184, are included in Process and Effluent Radiation Monitoring and Sampling System (PERMSS), which is described in DCD Tier 1, subsection 2.7.6.4 and functional test information for the radiation detectors is provided

in that subsection. Subsection 2.7.6.1 describes the verification for LRS discharge valve operation, pump operation, and alarms upon receipt of a simulated high radiation test signal.

The radiation check source is primarily used to check whether a particular radiation monitoring channel loop is live or functioning. The radiation check source is an uncalibrated radioactive source or equivalent that is used to confirm the continuing satisfactory operation of the radiation monitoring assembly, when exposed to the detector. A radiation check source is exposed to the detector on demand with an upscale measurement indication being a pass/fail criterion. The radioactive check source consists of a small amount of radioactive material chosen to provide a signal in the lower range of detection for verification of detector function. For this reason, the radiation check source cannot be used to verify the setpoint for the alarm and radiation level. Verification of the setpoint for the alarm and radiation level will normally be carried out periodically using the appropriate calibration source. Therefore, a simulated radiation signal will be used where necessary to produce the radiation level required to test the BOP ESFAS signals and RMS alarm functionality. Please see the response to RAI 8470, Question 14.03.08-14, Subquestion 4.a for further discussion on the use of a radiation check source and a simulated radiation signal.

DCD Tier 2, Subsection 11.5.2.1 will be revised to use of the word “radiation check source” instead of integral activated check source.

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### **Impact on DCD**

DCD Tier 1, Subsection 2.7.6.4.1, 2.7.6.5.1, Table 2.7.6.4-3, Table 2.7.6.5-3, and DCD Tier 2, Subsection 11.5.2.1 will be revised. (Refer to Response to RAI 219-8199 11.03-7 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.