May 18, 2015

AUDIT PLAN FOR APR1400 INTERNAL FLOOD PROTECTION

May 19 - 29, 2015

APR1400 DESIGN CERTIFICATION
Korea Hydro and Nuclear Power Co., Ltd.
Korea Electric Power Corporation
Docket No. 52-046

Location: U.S. Nuclear Regulatory Commission
Electronic reading room
Rockville, MD

Purpose:

The purpose of this audit is for the U.S. Nuclear Regulatory Commission (NRC) staff to: (1) gain an understanding on the basis of Advanced Power Reactor (APR)1400 internal flood protection to reach a reasonable assurance finding, and (2) review related documentation and non-docketed information to evaluate conformance with Standard Review Plan (SRP) Section 3.4.1.

Background:

Korea Hydro and Nuclear Power Co., Ltd. (KHNP) and Korea Electric Power Corporation (KEPCO) submitted, by a letter dated December 23, 2014, to the NRC, a Design Control Document (DCD) for its Design Certification (DC) application of the APR1400 design, accessible by Agencywide Documents Access and Management System (ADAMS) Accession Number ML15006A059. The NRC staff initiated this DC review on March 9, 2015. To facilitate the NRC staff's evaluation of internal flood protection and to complete its safety review of APR1400 DCD Section 3.4.1.3, "Flood Protection from Internal Sources," and Section 3.4.1.5, "Evaluation of Internal Flooding," the staff is planning a regulatory audit of KHNP document(s) on internal flood protection analysis. The audit will be carried out at the NRC Headquarters, Electronic Reading Room located in Rockville, Maryland.

Regulatory Basis:

An audit is needed to evaluate and identify detailed information related to the applicant's submittal in direct support of the safety conclusions that need to be made regarding APR1400 DCD Section 3.4.1.

The guidance, describing the following NRC regulations in this area of review, is provided in SRP Section 3.4.1, "Internal Flood Protection for Onsite Equipment Failures."

1. The requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," General Design Criterion (GDC) 2, "Design Bases for Protection Against Natural Phenomena," relate to structures, systems, and components (SSCs) important to safety being designed to withstand the effects of natural phenomena, such as earthquakes, tornados, hurricanes,

floods, tsunami, and seiches without loss of capability in order to perform their safety functions. SSC design bases must reflect appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena.

2. The requirements of 10 CFR Part 50, Appendix A, GDC 4, "Environmental and Dynamic Effects Design Bases," relate to SSCs important to safety being designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents (LOCAs). The effects of normal and accident conditions considered could include the effects of flooding from full circumferential failures of seismically designed piping as well as non-seismic, moderate-energy piping.

Audit Scope:

The specific scope of this audit is to review the bases for the proposed internal flood protection.

Audit Team:

Chang-Yang Li (NRO/SPSB, Flood Protection Audit Lead)
Robert Vettori (NRO/SPSB, Fire Protection)
Antonio Dias (NRO/SPSB Branch Chief)
William Ward (NRO, Sr. Project Manager)
Yunho Kim (KHNP)
Harry Chang (KHNP)

Information and Other material Necessary for the Regulatory Audit:

The analysis and calculation being used to support DCD Tier 2, Section 3.4.1, "Flood Protection and Evaluation; Section 3.4.1.3, "Flood Protection from Internal Sources;" and Section 3.4.1.5, "Evaluation of Internal Flooding," are to be made available to the NRC staff.

Logistics:

The audit will be executed by viewing the documentation made available by KHNP in the electronic reading room made available by KHNP. An access request for the audit team has been sent to KHNP. The NRC staff will view the documents from their NRC workstations.

Any questions and its responses will be routed through the NRC project manager, William Ward at 301-415-7038, or via email at William.Ward@nrc.gov, and the KHNP contacts. The questions and outcomes will be discussed in the audit report.

Any changes related to the conductance of the audit will be communicated to the NRC project manager.

Special Requests:

The NRC staff acknowledges the proprietary nature of the information requested. The information will be handled appropriately throughout the audit. While the NRC staff will take

notes, the electronic reading room is set up to not allow the NRC staff to create copies or print the electronic files.

The NRC staff requests KHNP personnel to provide an overview of the documents prior to the staff's review. This overview may be in written form. The NRC staff will schedule a conference call to discuss the details in these documents and their audit findings following its review.

Schedule and Deliverables:

An audit report will be generated after completion of the audit following the Office of New Reactors (NRO) Office Instruction, NRO-REG-108, "Regulatory Audits." The audit may assist the NRC staff in the issuance of requests for additional information (RAIs) for the licensing review of APR1400 DCD Section 3.4.1. Any RAIs identified as a result of the audit will be discussed in the audit report.

References:

1. 10 CFR Parts 50, "Domestic Licensing of Production and Utilization Facilities," and 52 "Licenses, Certifications, and Approvals for Nuclear Power Plants."

2. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition", Chapter 3, "Design of Structures, Components, Equipment, and Systems."

3. KHNP APR1400 Design Control Document – Tier 2 Chapter 03 – Design of Structures, Systems, Components, and Equipment (ML15006A059).

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4. 10 CFR Parts 50, "Domestic Licensing of Production and Utilization Facilities," and 52 "Licenses, Certifications, and Approvals for Nuclear Power Plants."

5. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition", Chapter 3, "Design of Structures, Components, Equipment, and Systems."

6. KHNP APR1400 Design Control Document – Tier 2 Chapter 03 – Design of Structures, Systems, Components, and Equipment (ML15006A059).

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