

June 22, 2015

**AUDIT PLAN FOR APR1400 HUMAN FACTORS ENGINEERING DESIGN**

**June 22, 2015 – July 7, 2015**

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

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

Purpose:

The purpose of this audit is for the U.S. Nuclear Regulatory Commission (NRC) staff to review documentation identified in Chapter 18, "Human Factors Engineering," of the APR1400 Final Safety Analysis Report (FSAR) and referenced technical reports as the "APR1400 DC Project Procedure Manual," (DC-BG-01-20). Korea Hydro and Nuclear Power Co., Ltd. (KHNP) has informed the NRC that the document name is incorrect and needs to be changed to the "Engineering Procedure Manual" or EPM. KHNP also stated that the EPM consists of multiple procedures, not all of which are applicable to Chapter 18.

Background:

KHNP and Korea Electric Power Corporation (KEPCO) submitted, by a letter dated December 23, 2014, to the NRC, a FSAR 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 the human factors engineering (HFE) design and to complete its safety review of APR1400 FSAR Chapter 18, "Human Factors Engineering," the staff is planning a regulatory audit of the KHNP document(s) listed as the Project Procedure Manual in Chapter 18. 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 FSAR Chapter 18.

NUREG-0800, "The Stand Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," (SRP) provides the guidance for the NRC staff to use in reviewing a DC application. Chapter 18 of the SRP, "Human Factors Engineering," and NUREG-0711, "Human Factors Engineering Program Review Model," provide the guidance to review FSAR Chapter 18. These two NUREGs identify, among others, the following applicable regulatory requirements:

1. Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47, "Contents of applications; technical information states, "The application must contain a level of design information sufficient to enable the Commission to judge the applicant's proposed means of assuring that construction conforms to the design and to reach a final conclusion on all safety questions associated with the design before the certification is granted. The information submitted for a design certification must include performance requirements and design information sufficiently detailed to permit the preparation of acceptance and inspection requirements by the NRC, and procurement specifications and construction and installation specifications by an applicant."
2. Section 10 CFR 52.6, "Completeness and accuracy of information" requires applicants to submit complete and accurate information.

Chapter 18 of the FSAR references the HFE program plan (APR1400-E-I-NR-14001). The HFE program plan incorporates by reference the KHNP Project Procedure Manual (PPM).

Based upon the descriptions of the PPM in the HFE program plan, it appears as if material in this document is necessary to assess the acceptability of several NUREG-0711 criteria (NUREG-0711 Section 18.1.4.3, Criteria 1, 2, & 4; NUREG-0711 Section 18.1.4.4, Criteria 2 & 4).

Audit Scope:

The specific scope of this audit is to review the document, "Project Procedure Manual." The audit scope may be extended to review documents referenced in this manual, which are not currently available for the NRC staff's review, for the same reason the staff is reviewing this manual.

Audit Team:

Paul Pieringer (NRO/DCIP/COLB, HFE Audit Lead)  
Brian Green (NRR/DRA/APHB, Human Factors Engineer)  
Jacqwan Walker (NRO/DCIP/COLB, Human Factors Engineer)  
Lauren Kent (NRO/DCIP/COLB, Human Factors Engineer)  
Michael Junge (NRO/DCIP/COLB Branch Chief)  
William Ward (NRO, Sr. Project Manager)  
Yunho Kim (KHNP)  
Harry Chang (KHNP)

Information and Other material Necessary for the Regulatory Audit:

The document identified in FSAR Tier 2, Chapter 18, "Project Procedure Manual," and any document referenced by the manual 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 audit conduct 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 may request KHNP personnel to provide an overview of the documents during the staff's review. This overview may be in written form. The NRC staff will schedule a teleconference to discuss the details in these documents and their audit findings following its review.

Schedule and Deliverables:

An audit report will be generated after the completion of the audit following the NRO Office Instruction, NRO-REG-108, "Regulatory Audits." The audit may assist the NRC staff in the issuance of RAIs for the licensing review of APR1400 FSAR Chapter 18. Any RAIs identified as a result of the audit will be discussed in the audit report.

References:

1. 10 CFR Part 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 18, "Human Factors Engineering."
3. KHNP APR1400 Final Safety Analysis Report – Tier 2 Chapter 18 – Human Factors Engineering (ML15006A057).
4. KHNP APR1400 Technical Report APR1400-E-I-NR-14001, Revision 0, "Human Factors Engineering Program Plan" (ML15009A207).

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**NRO-002**

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<b>DATE</b>	06/18/2015	06/22/2015	06/22/2015

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