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## 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.: 350-8401  
SRP Section: 18 – Human Factors Engineering  
Application Section:  
Date of RAI Issue: 12/22/2015

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### **Question No. 18-59**

Regulation: 10 CFR 52.47(a)(8), 10 CFR 50.34(f)(2)(iii), and NUREG-0711, Section 8.4.3, "HFE [Human Factors Engineering] Design Guidance for HSIs [Human-System Interfaces]"

Evaluation: APR1400-E-I-NR-14011-P, Rev. 0, "Basic Human-System Interface," Section 1, "Purpose," states, "This document describes the conceptual design of the APR1400 Basic HSI which includes, by reference, the APR1400 Basic HSI Style Guide (Reference 1) (also referred to as Style Guide)." This implies the Style guide is specific to the Basic HSI design rather than the AP1400 HSI detailed design. This understanding is reinforced in a subsequent paragraph which says, "All figures in this document that show video displays or control panel layouts depict the design standards of the Style Guide and the design basis inventory content of the Basic HSI."

APR1400-E-I-NR-14012-P, Rev. 0, "Style Guide," Section 1, "Introduction," states, "This human factors engineering (HFE) Style Guide has been developed to provide a user centric design to the Advanced Power Reactor 1400 (APR1400) main control room (MCR) and specific local control stations (LCSs). This appears to contradict the statements referenced above.

Question: Clarify which part of the HFE design the Style Guide is applicable to. If the current Style Guide is limited to the Basic HSI design, provide an updated document that supports the APR1400 detailed HSI design.

### **Response**

The Style Guide is applied to the human factors engineering (HFE) design process. It is not limited to the basic human-system interface (HSI) design, but is applicable to the APR1400 Basic HSI, the APR1400 HSI, and the APR1400 HSI facilities. Technical report APR1400-E-I-NR-14012, Rev. 0, "Style Guide," Section 1, "Introduction" will be revised to state the correct application of the Style Guide, as indicated in the attachment associated with this response.

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**Impact on DCD**

There is no impact on the DCD.

**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**

Technical report APR1400-E-I-NR-14012-P/NP, Rev.0, "Style Guide," Subsection 1 will be revised, as indicated in the attachment associated with this response.

## 1 INTRODUCTION

This human factors engineering (HFE) Style Guide has been developed to provide a user centric design to the Advanced Power Reactor 1400 (APR1400) ~~main control room (MCR) and specific local control stations (LCSs)~~. The Style Guide provides design guidance to assure that the ~~human system interface (HSI)~~ design is sufficient and consistent, thus contributing to operational safety. This Guide is designed to be used in conjunction with associated piping and instrumentation diagrams (P&IDs) which specify various components' design. The human factors items not covered in this document follow the criterion of the control room human engineering of NUREG-0700 (Rev.2).

HSI

basic human-system interface (HSI), APR1400 HSI, and APR1400 HSI facilities

### 1.1 Scope

The Style Guide contains the design guidance for the APR1400 HSI systems including LCSs associated with important human actions (IHAs), as well as environmental conditions in the following areas:

- MCR,
- Remote shutdown room (RSR),
- Technical support center (TSC), and
- Emergency operating facility (EOF)

### 1.2 Purpose

The purpose of this document is to provide APR1400 HSI designers with design guidance that has human factors principles as their foundation. These principles, called user centric, are included to create an effective interface that is easy to use. This is in support of the HSI Implementation Plan design concept of keeping the operator in control of the plant. Control means providing up to date, valid, accurate and reliable information and control capabilities. This Guide styles the information and controls.