
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.: 250-8282
SRP Section: 18 – Human Factors Engineering
Application Section: 18.6 Treatment of Important Human Actions (TIHAs)
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Question No. 18-28

10CFR 52.6(a) states in part, “Information provided to the Commission by...an applicant for a standard design certification...shall be complete and accurate in all material respects.”

Section 6, “Results Summary Report,” of APR1400-E-I-NR-14004-P, “Task Analysis Implementation Plan” (TA IP), Revision 0 discusses an ITAAC associated with completion of the TA Results Summary Report (ReSR); however, Table 2.9-1, “Human Factors Engineering ITAAC,” in DCD Tier 1 does not include ITAAC for completion of the TA ReSR.

Revise the documentation to conform to the information in DCD Tier 1 Table 2.9-1.

Response

The human factors (HF) verification and validation (V&V) determines that the final human system interface (HSI) design conforms to accepted human factors engineering (HFE) design principles, including the task analysis (TA). The HF V&V is a way to verify that the HSI is sufficient, since the results of other program elements are fed into the HF V&V.

Therefore, the only HFE program elements that have ITAACs are the HF V&V and the design implementation.

The TA Implementation Plan will be revised to eliminate mention of an ITAAC associated with the completion of the TA ReSR, as indicated in the attachment associated with this response.

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-14004-P/NP, Rev.0, "Task Analysis Implementation Plan," Subsection 6 will be revised as indicated in the attachment associated with this response.

6. RESULTS SUMMARY REPORT

The results of the TA are documented in the ReSR, either directly or through reference to the TA database. This report demonstrates that the analysis of tasks for the plant operating crew was conducted in accordance with this IP. ~~Demonstrating conformance to this IP, as documented through this ReSR, is a requirement of the TA inspections, tests, analyses, and acceptance criteria defined in the APR1400 DCD Tier 1 (Reference 6).~~

The TA data are created and stored within a database to allow the information to be modified and updated. Existing portions of the analysis are updated to reflect any changes to the plant design to ensure internal consistency between the TA database and the APR1400 design. The TA database incorporates all event sequences and the related results from the analysis of the sequences.

In addition to referencing the TA database, the TA ReSR includes the following:

1. The TA results overview, which describes the principal findings of the HFE PE, including confirmation of IHAs and an overview of any HEDs
2. Each TA team member's name, SME position filled, and the types of TA outputs generated by the team member (the outputs generated or reviewed by each member are documented in the TA database)
3. A summary tabular listing of all tasks for which a TTA was conducted, including the workload and time margin results
4. A detailed description of any resulting HEDs including conflicts between TA results and the results of previous HFE PEs or the APR1400 plant design, and HEDs that identify excessive workload or inadequate time margin
5. A conclusion that TA:
 - a. Has been conducted in accordance with the TA IP
 - b. Demonstrates that the tasks conducted by plant operators have been analyzed to establish HSI inventory requirements
 - c. Confirms that all analyzed tasks can be conducted with acceptable workload and time margin within the staffing design constraints (except as may be noted by HEDs)

The TA is a one-time, nonrecurring HFE PE whose closure is marked by issuance of the TA ReSR. However, task analyses conducted within the TA are iterative in that HEDs generated by other HFE PEs are evaluated for any potential changes needed in those task analyses. Similarly, plant design changes are evaluated for their impact to the output of all HFE PEs, including the output of the TA; HEDs are generated as needed. Therefore, any task analysis changes that may be needed after completing the TA ReSR are managed through the HED resolution process. HEDs that affect TA outputs are resolved prior to completing the HD, which establishes the APR1400 HSI design for the V&V.

After completion of the V&V, site-specific changes, including any required TA output changes, are managed within the DI, which is a recurring PE for each plant. The DI also ensures that all HEDs are closed.