From: Getachew Tesfaye
To: DAFLUCAS Ronda M.
Date: 9/4/2007 4:13:56 PM
Subject: Draft RAIs - Human Factors Engineering Topical Report ANP-10279

Ronda:

Attached are the Staff's draft Request for Additional Information pertaining to the subject Topical Report, ANP-10279, "U.S. EPR Human Factors Engineering Program Topical Report, Revision 0." Our Technical Staff would like the opportunity to discuss these RAIs via telephone conference on Wednesday September 5th, 2007. Please let me know as soon as possible what time will work best for you and your staff.

Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/ NARP

CC: James Bongarra; Michael Canova; Michael Junge

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DRAFT

REQUEST FOR ADDITIONAL INFORMATION (RAI)

ANP-10279, "U.S. EPR HUMAN FACTORS ENGINEERING

PROGRAM TOPICAL REPORT," Revision 0 (TAC NO. MD4252)

PROJECT NUMBER 733

RAI-01: General Comment: The use of the terminology human-machine interface (HMI) and human-system interface (HSI) throughout the report is confusing. The distinction between the two terms should be clarified.

RAI-02: General Comment: Use of a combination of verb tenses "should"/"should be" vs "will"/"will be," vs "are", etc., make it difficult to determine whether a commitment is made or not. For example, on p.2-3, "The acoustic environment and the mean noise level in the MCR should aid operator alertness..." versus "The lighting in the control rooms provide optimum working conditions..."

RAI-03: P.4-5, section 4.2.3: "Single purpose, fixed-location, continuously available controls and related displays should remain available via the SICS." Does this mean they always will be available or that they might be available or unavailable? Please clarify.

RAI-04: P. 5-3, figure 5.2-1: Please describe (compare and contrast) the individual functions of Human Factors Design, HSI Design, Controls Rooms Design, and Automation Systems Design.

RAI-05: P. 5-12, section 5.4.2.1.2: "As the design evolves, the structure of the HFE and Control Room Design Team may change; however, the functions required of the team do not transfer to any other organization." If this were to occur, could the team's authority for exercising its responsibility for the HFE program change, especially diminish? What are the controls in place to prevent this from occurring?

RAI-06: P. 5-22, section 5.4.3.1: Why are personnel interviews limited to utility personnel?

RAI-07: P. 5-27, section 5.4.4: "For the U.S. EPR, the process for defining and allocating plant functions is not relevant to the HSI design as the HSI design has evolved to a high level of detail. Implementation of a process of FRA and FA would be equivalent to reverse engineering for the sake of creating documentation." Please explain the rationale for these statements.

Also, this section continues by saying that, "....AREVA NP will extract... a list of functions that have been automated for the OL3 plant. AREVA NP will then compare that list of functions to the list derived for the U.S. EPR from system and function activities and capture the differences. The completed FA would then consist of those functions which are allocated identically for OL3 and the U.S. EPR and a list of gaps." Was an FRA and FA completed for OL3? What is meant by

"....the list derived for the U.S. EPR from system and function activities"....i.e., what are the U.S. EPR system and function activities?

RAI-08: P. 5-29, section 5.4.5: "The operating procedures for the U.S. EPR are based on the work developing procedures for the OL3 EPR and other precursor plants. The completed operating procedures constitute an analysis of the tasks that operators should perform to safely operate the plant. The operating procedures should satisfy the required safety objectives to be considered completed. The completed plant procedures are subjected to a separate verification process to evaluate their technical effectiveness. For the U.S. EPR, the TA will consist of verification (see Section 5.4.11) that controls and displays are available and are organized to be compatible with the intended operations, including safety objectives as a subset, as defined in the procedures."

It appears that AREVA NP will use OL3 operating procedures as the basis for determining operator tasks for the U.S. EPR. However, it is the output from task analysis that is used as an input to developing procedures. Also section 5.4.9 states, "... AREVA NP will produce operational guidelines for the development of plant-specific normal operating, abnormal operating, alarm response, and EOPs ...." From this statement, it appears that AREVA NP will develop U.S. EPR-specific "generic guidelines." Please explain how these guidelines will be used to determine operator tasks. Also, how will AREVA NP account for any operator tasks that are not contained in procedures? Has a task analysis been completed for OL3? Has/will AREVA NP use the OL3 task analysis to determine operator tasks required for the U.S. EPR?

RAI-9: From a human factors engineering standpoint, how similar is the OL3 HSI design to the AREVA NP HSI design? What are the major HSI design differences?

RAI-10: Please explain how the concept of "Minimum Inventory" of alarms. controls, and displays, needed to bring the plant to safe shutdown conditions in the event of a loss of all primary instrumentation is addressed by the U.S. EPR design.

RAI-11: Appendix A, Table A-2, p.A-4: Will the Implementation Plan(s) for HSI be included as part of the DCD for the U.S.EPR?

RAI-12: Appendix A, Table A-2: Under the heading, "Output Results," and "Schedule," what is meant by "Detailed Design?" When in the overall human factors engineering design process, will the "output results" be completed for each HFE Program Element? How will the products for each element be available to the staff for review and approval?