

March 3, 2009

Mr. Ronnie L. Gardner
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SUBJECT: AREVA NP, INC. – REVIEW STATUS OF THE U.S. EPR HUMAN FACTORS
ENGINEERING PROGRAM TOPICAL REPORT - ANP-10279

Dear Mr. Gardner:

By letter dated January 29, 2007 (ML070370196), AREVA NP, Inc. (AREVA) submitted for U.S. Nuclear Regulatory Commission (NRC) staff review Topical Report ANP-10279, Revision 0, "U.S. EPR Human Factors Engineering Program Topical Report," (ML070370197). The NRC accepted this topical report for review March 22, 2007 (ML070660037). NRC staff issued an initial request for additional information (RAI) by letter dated September 11, 2007 (ML072530009). Responses to these questions were made by letter dated October 30, 2007 (ML073090055). NRC staff issued a second RAI on June 26, 2008 (ML081780409). A partial response to these questions occurred by letter dated September 24, 2008 (ML082740369), and a final response occurred by letter dated December 18, 2008 (ML083570589).

The staff finds that the topical report doesn't satisfactorily address the 12 HFE criteria of NUREG-0711 in three broad areas, identified in the enclosure. These criteria must be addressed for the staff to make a reasonable assurance of safety finding. AREVA is being given an opportunity to review and discuss the issues contained in the attached enclosure.

If you have any questions regarding this matter, I may be reached at 301-415-3361.

Sincerely,

/RA/

Getachew Tesfaye, Sr. Project Manager
EPR Projects Branch
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-020
Enclosure: Summary of Additional Information Needed
cc: DC AREVA – EPR Mailing List

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(Revised 02/23/2009)

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SUMMARY OF AREAS OF ADDITIONAL INFORMATION NEEDED BY THE NRC STAFF

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

REPORT," REVISION 0

DOCKET NO. 52-020

BACKGROUND

By letter dated January 29, 2007 (ML070370196), AREVA NP Inc. (AREVA NP) requested the U. S. Nuclear Regulatory Commission (NRC) to review and approve ANP-10279, *U.S. EPR Human Factors Engineering Topical Report, Revision 0* (ML070370197). The topical report (TR) describes AREVA NP's human factors engineering process that will be employed to design the human-system interfaces (HSIs) and associated equipment in EPR nuclear power plant control rooms. The goal of the U.S. EPR human factors engineering (HFE) program is to provide reasonable assurance that plant operators can access the required information and controls to enable safe and efficient control and monitoring of plant processes and equipment. The TR is intended to describe the methodologies used to make this determination.

By letter dated March 22, 2007 (ML070660037), the NRC staff identified that it had performed an acceptance review of the subject TR and had determined that based on an initial review, the material presented at that time was sufficient to begin a comprehensive review and develop Requests for Additional Information (RAIs).

In a letter dated September 11, 2007 (ML072530009), the NRC issued 12 RAIs on the TR. AREVA NP responded to the RAI request by letter dated October 30, 2007 (ML073090055). Based on the staff's review of AREVA NP's responses to the RAIs, the NRC determined that additional information was still required to complete the review and, therefore, four of the RAIs remained open. The NRC issued 57 additional RAIs in its letter dated June 26, 2008 (ML081780409). In letters dated September 24, 2008 (ML082740369) and December 18, 2008 (ML083570589), AREVA issued final responses to the RAI requests.

On October 23, 2008, a public meeting was held between AREVA NP and the HFE staff regarding responses to TR and DCD RAIs. A key discussion item was AREVA NP's intention to use predecessor plant HFE design information to satisfy the criteria in NUREG-0711.

On December 18, 2008, the NRC staff conducted an audit of the AREVA documents related to the U.S. EPR human factors program. The purpose of the audit was to examine and evaluate non-docketed technical, procedural and process information, and to identify documentation that will require docketing to support the basis of FSER Chapter 18 licensing and regulatory decisions. During the audit, AREVA NP and NRC staff discussed AREVA NP's plan to use HFE information from the Olkiluoto 3 (OL3) nuclear power plant as a basis for meeting the criteria for task analysis, function analysis, and functional allocation found in NUREG-0711, *Human Factors Engineering Program Review Model*.

ENCLOSURE

ADDITIONAL INFORMATION REQUIRED TO SUPPORT STAFF REVIEW

Based on its previous reviews and the audit on December 18, 2008, the staff has identified three broad areas where additional information is needed. These areas are the use of predecessor design information, the need for detailed implementation plans, and the requirement for docketing of materials used in the staff's safety reviews. These information needs were discussed with AREVA NP during the December 18, 2008, audit. The information that the staff still needs in order to complete the review of the U.S. EPR is summarized below:

1. Predecessor design information:

NUREG-0711 Section 1.2.1, "General Description of the Program Review Model," states that in general applicants are expected to submit two reports for NRC review; an implementation plan and a results summary report. An implementation plan is described as the applicant's proposed methodology for meeting the acceptance criteria of the element. AREVA NP is planning to use the information from their predecessor OL3 plant in lieu of conducting a separate Task Analysis for the U.S. EPR. The staff determined that this is not acceptable because the OL3 design has not been reviewed and approved by the U.S. NRC and there is no operating experience with either the OL3 or any other EPR plant.

During a meeting on October 23, 2008, and the audit on December 18, 2008, AREVA explained that they were producing an inheritance document that would capture all of the information they planned to use from the OL3 plant to satisfy the NUREG-0711 criteria. The staff developed a series of RAIs (RAI 7, RAI 8, RAI 25, RAI 31, RAI 32) which asked AREVA to define and clarify what information they were planning to use from their predecessor design. AREVA NP presented information at the meetings informing the staff of the role that the Inheritance Plan will play in integrating the various elements of the program. AREVA informed the staff that much of the EPR functional analysis and task analysis will be based on the work done for the OL3 plant and that the inheritance plan will provide the approach that will be used to utilize the existing information to align it with NUREG-0711 and to identify any gaps.

The staff is waiting for AREVA NP to submit the inheritance implementation plan in order to verify that the analyses used at the OL3 plant have met the intent of NUREG-0711 criteria. AREVA NP stated in their response to RAI 7 that this inheritance plan would be available for staff review in the 2nd quarter of 2009.

2. Detailed implementation plans:

The staff has determined that in the following areas defined in NUREG-0711 additional information is needed before a safety determination can be made. At a minimum, the staff will review an applicant's detailed implementation plans prior to approving a design certification submittal. The staff's review will include implementation plans associated with the following areas:

1. Human factors engineering (HFE) program management
2. Operating experience review
3. Functional requirements and function allocation
4. Task analysis
5. Staffing and qualifications

6. HRA integration
7. Human-system interface (HSI) design
8. Procedure development
9. Training program development
10. Human factors verification and validation (V&V)
11. Design implementation
12. Human performance monitoring

Listed below is a summary of the RAIs that have already been submitted to AREVA NP requesting implementation plans and that must be addressed in order for the staff to make a safety determination.

- **Operating Experience Review:** AREVA NP has been asked to clarify the current status of the OER and indicate when the results will be available for review. **This is RAI 31, Clarify status of OER, and RAI 171, docketing of implementation plans.**
- **Functional requirements analysis and function allocation:** AREVA NP has been asked to provide the Function Analysis and allocation implementation plan. **This is RAI 171, docketing of implementation plans.**
- **Task Analysis:** It appears that AREVA NP will use OL3 operating procedures as the basis for determining operator tasks for the U.S. EPR. Initially RAI 8 requested clarification of AREVA NP's plans for conducting a task analysis. AREVA NP responded that they were planning to use the information from their predecessor OL3 plant in lieu of conducting a separate task analysis for the U.S. EPR. The staff has determined that this is not acceptable because the OL3 design has not been reviewed and approved by the U.S. NRC and there is no operating experience with either the OL3 or any other EPR plant. AREVA NP has been asked to provide additional detailed information, including methodologies and results. **This is follow-up RAI 8, Clarify the relationship between AREVA NP's approach to task analysis and NUREG-0711, Section 5 review criteria.**
- **Staffing and qualifications:** AREVA NP indicates that the implementation plan is complete and that the internal assumptions are documented and will be summarized in the DCD. AREVA NP has been asked to address the availability of a staffing and qualifications implementation plan and results summary. **This is RAI 33, Availability of a staffing and qualifications implementation plan and RAI 34, Documentation of staffing and qualification results.**
- **HRA Integration:** The topical report mentions that risk-important human actions (R-I HAs) will be determined but does not address a method or acceptance criteria. AREVA NP has been asked to provide the implementation plan to address methodology and acceptance criteria for HRA integration. **This is RAI 44, Provide expanded discussion of R-I HAs, and RAI 171, Docketing of implementation plans.**
- **HSI Design:** AREVA NP has been requested to provide an implementation plan and to describe the relationship between the design goals and basis and the

control room HSI standard features. **This is RAI 45, Clarify the relationship between design goals and standard features, and RAI 171, Docketing of implementation plans.**

- **Procedure development:** AREVA NP has been requested to provide an implementation plan for the full scope of procedures including maintenance and test, a writer's guide, plant procedures, and emergency procedure guidelines. **This is RAI 46, Clarify the scope of procedure development, RAI, 47 Clarify output of procedure development activity, and RAI 48, Provide schedule for Emergency Procedure Guidelines (EPGs).**
- **Training program:** AREVA NP has been asked to clarify its role in training program development and what information will be provided to the COL applicant as the designer's input to training. **This is RAI 49, Clarify scope of training program, RAI 50, Clarify AREVA NP's input to training program development, and RAI 51, Clarify output of training related activities.**
- **Human factors verification and validation:** AREVA NP has been asked to clarify how verification and validation will be performed. **This is RAI 52, Clarify task support verification methodology.**
- **Design Implementation:** AREVA NP has been asked to provide an implementation plan for the HFE design. **This is RAI 171, docketing of implementation plans.**
- **Human Performance Monitoring:** AREVA NP has been asked to submit the Human Performance Implementation Plan for staff review. **This is RAI 171, docketing of implementation plans.**

Once the detailed implementation plans are completed and submitted, the staff will continue to review the U.S. EPR design certification.

3. Docketing of referenced information:

The staff's safety determination will be made on the basis of docketed materials. Reports and analyses which AREVA NP has referenced in its DCD or TR and which describe how AREVA NP has met the criteria listed in NUREG-0711 need to be available on the NRC docket for the staff's review. Such reports may include implementation plans, program plans, the inheritance plan, and results summaries.

As summarized in item 2 above, the staff has issued a number of RAIs requesting documents, including RAI 171 which listed those specific documents which were reviewed during the December 18, 2008, audit and which were requested for the docket. Prior to making a safety determination, the staff is awaiting AREVA NP's response to its RAIs.

CONCLUSION

Additional information must be docketed before the staff can complete its SRP Chapter 18 safety evaluation. The staff has written RAIs requesting certain information and documents that

the staff must review to determine whether AREVA NP has satisfied NUREG-0711 criteria. Once AREVA NP has provided the information and clarification requested in the RAIs, the staff will continue its review of the DCD and TR against the criteria of NUREG-0711. Based on the completeness and adequacy of information submitted on the docket by AREVA NP, the staff will determine whether additional RAIs will need to be issued.