ArevaEPRDCPEm Resource

From: BRYAN Martin (EXTERNAL AREVA) [Martin.Bryan.ext@areva.com]
Sent: Monday, February 21, 2011 10:14 AM
To: Tesfaye, Getachew
Cc: DELANO Karen (AREVA); ROMINE Judy (AREVA); BENNETT Kathy (AREVA); NOXON David (AREVA); WELLS Russell (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 472, FSAR Ch. 18
Attachments: RAI 472 Response US EPR DC.pdf

Getachew,

Attached please find the AREVA NP Inc. (AREVA NP) response to the subject request for additional information (RAI). The attached file, "RAI 472 Response U.S. EPR DC.pdf" provides a technically correct and complete response to the one question in RAI 472.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the response to RAI 472 Question 18-238.

The following table indicates the respective pages in the response document, "RAI 472 Response U.S. EPR DC," that contain the AREVA NP response to the subject questions.

Question #	Start Page	End Page
RAI 472 — 18-238	2	2

This completes the formal AREVA NP response to RAI 472. There are no additional questions associated with this RAI.

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Wednesday, February 02, 2011 4:12 PM
To: ZZ-DL-A-USEPR-DL
Cc: Bongarra, James; Walker, Jacqwan; Pieringer, Paul; Junge, Michael; Ford, Tanya; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 472 (5462), FSAR Ch. 18

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on February 2, 2011, and on the same day on February 2, 2011, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft RAI. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt

of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 2584

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Subject: Response to U.S. EPR Design Certification Application RAI No. 472, FSAR Ch. 18
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Created By: Martin.Bryan.ext@areva.com

Recipients:
"DELANO Karen (AREVA)" <Karen.Delano@areva.com>
Tracking Status: None
"ROMINE Judy (AREVA)" <Judy.Romine@areva.com>
Tracking Status: None
"BENNETT Kathy (AREVA)" <Kathy.Bennett@areva.com>
Tracking Status: None
"NOXON David (AREVA)" <David.Noxon@areva.com>
Tracking Status: None
"WELLS Russell (AREVA)" <Russell.Wells@areva.com>
Tracking Status: None
"Tesfaye, Getachew" <Getachew.Tesfaye@nrc.gov>
Tracking Status: None

Post Office: AUSLYNCMX02.adom.ad.corp

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Response to

Request for Additional Information No. 472(5462), Revision 0

2/2/2011

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 18 - Human Factors Engineering
Application Section: FSAR Chapter 18

QUESTIONS for Operating Licensing and Human Performance Branch (AP1000/EPR Projects) (COLP)

Question 18-238:

FSAR Treatment of Operational Programs for Training and Procedures

SECY-05-0197 designated training of plant operators and staff (including operator requalification) as an operational program required by regulation (or license condition) for a combined license (COL) application. SECY-05-0197 further identifies that training is an operational program that is addressed by SRP Chapter 13, Conduct of Operations.

The NRC Staff has reviewed training, as an operational program and COL responsibility, in its safety evaluation for Chapter 13, (specifically, sections 13.2.1, and 13.2.2). SECY-05-0197 established the regulatory position that training, as an operational program, is the COL applicant's responsibility to address and not the responsibility of the design certification applicant. Additionally, under certain conditions (e.g., see 10CFR 55.59 (c)), a licensee may or may not use the SAT process to meet certain training-related requirements. Thus, specifying, in the FSAR, that a COL must use a SAT process conflicts with current regulation. Therefore, the Staff requests AREVA to reconcile any discrepancies in the Chapter 18 FSAR (and related IPs) that dictate certain training responsibilities in the design certification which are the COL applicant responsibility, as an operational program, according to SECY-05-0197.

The Staff notes that this same rationale applies to the procedures element currently identified in the applicant's Chapter 18 FSAR and related IP.

Response to Question 18-238:

Since procedures and training are operational programs that are administered by the COL applicant and should not be part of the design certification, AREVA will retract the U.S. EPR Human Factors Procedure and Training implementation plans and leave only the FSAR COL items related to these topics. These become a requirement for the COL applicant to ensure that human factors principles are incorporated into the development of plant procedures and operator training.

U.S. EPR FSAR, Tier 1 Section 3.4 and Tier 2, Sections 18.8 and 18.9 will be revised to reflect these changes to the procedures and training documentation.

FSAR Impact:

U.S. EPR FSAR, Tier 1 Section 3.4 and Tier 2, Sections 18.8 and 18.9 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

applicable system design and follows guidelines established by the HFE and Control Room Design Team. ~~The HFE and Control Room Design Team also participates in the design of the Emergency Operations Facility (EOF).~~

The scope of the HFE program includes HSI that are related to plant process monitoring and control, as well as input to procedures and training associated with monitoring and controlling instrumentation and control (I&C) systems. The I&C systems include those required during normal operating modes as well as those required during tests, inspections, surveillances, maintenance, abnormal, emergency, and accident conditions. HSI associated with non-I&C systems (e.g., manual valve operators and other LCS) follow guidelines established by the HFE and Control Room Design Team.

2.0 Design Features

1.0 HFE operating experience review (OER) is performed in accordance with the prescribed process described in the U.S. EPR Human Factors Operating Experience Review Implementation Plan.

2.0 Functional requirements ~~are~~ analysis is performed in accordance with the prescribed process described in the Functional Requirements Analysis and Functional Allocation Implementation Plan.

3.0 Functional allocation decisions are made based on a set of automation criteria which is defined and validated with the prescribed process described in the Functional Requirements Analysis and Functional Allocation Implementation Plan.

4.0 A task analysis is performed in accordance with the prescribed process described in the U.S. EPR Task Analysis (TA) Implementation Plan.

5.0 The staffing and qualification analysis includes an evaluation of the number and qualifications of personnel needed to operate, maintain, and test the U.S. EPR based on HSI design features as described in the TA Implementation Plan.

6.0 Human reliability analysis evaluates the potential for, and mechanisms of, human errors that may affect plant safety. Integration of human reliability analysis findings with HFE design is performed in accordance with the U.S. EPR Implementation Plan for the Integration of Human Reliability Analysis (HRA) into the Human Factors Engineering (HFE) Program.

7.0 HSI design is performed in accordance with the prescribed process described in the U.S. EPR Human System Interface Design Implementation Plan.

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8.0 The selection of the minimum inventory is performed in accordance with the U.S. EPR Human System Interface Design Implementation Plan.

9.0 ~~Procedures are developed in accordance with the Procedure Implementation Plan which directs the integration of the U.S. EPR Human Factors procedure development~~Deleted.

10.0 ~~Training is developed in accordance with the U.S. EPR Training Implementation Plan~~Deleted.

18.8 Procedure Development

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Procedures are essential to plant safety because they support and guide personnel interactions with plant systems and personnel responses to plant-related events. Procedures and the human system interfaces (HSI) are designed in parallel using similar processes and incorporating the same accident analyses; the evaluation processes used are also interrelated. Human factors principles are applied to aspects of the interface to verify complete integration and consistency. Procedure development is further discussed in Section 13.5.~~Refer to Section 3.2 of the AREVA NP U.S. EPR Human Factors Procedure Implementation Plan (Reference 1) for a generic outline of HFE program input to the procedure development process for the U.S. EPR.~~

A COL applicant that references the U.S. EPR design certification will describe how HFE principles and criteria are incorporated into the development program for site procedures.

18.8.1 ~~Objectives and Scope~~

~~From the perspective of the HFE program, the objectives of procedure development activities are to develop procedures that are technically accurate, comprehensive, explicit, easy to use, and validated (i.e., the user can comply with the requirements of each step).~~

~~HFE guidelines are applied to all procedures associated with plant operations and testing:~~

- ~~Generic Technical Guidelines (GTG) for emergency operating procedures.~~
- ~~Plant and system operations (including startup, power, and shutdown operations).~~
- ~~Abnormal and emergency operations.~~
- ~~Alarm response.~~
- ~~Equipment testing.~~

18.8.2 ~~Methodology~~

~~Procedure development activities consider the following aspects:~~

- ~~Plant design basis.~~
- ~~System-based technical requirements and specifications.~~
- ~~Results of task analyses (TA).~~

- ~~Risk-important human actions (HA) identified in the human reliability analysis (HRA), probabilistic risk assessment (PRA), and operating experience review (OER).~~

- ~~Initiating events to be considered in emergency operating procedures (EOP), including those events in the design bases.~~

- ~~GTG for EOP.~~

~~Operational guidelines are provided to the COL applicant referencing the U.S. EPR standard design to assist in the development of plant-specific normal operating, abnormal operating, alarm response, and EOPs that incorporate the aspects of the HSI design appropriate to the completion of the plant-specific procedure (see Section 13.5.2.1.3). Generic plant operational guidelines are part of procedure development and are a significant contribution to HSI design because they are developed or modified to reflect the characteristics and functions of the screen-based or conventional HSIs, as appropriate.~~

~~The procedure implementation plan (Reference 1) describes:~~

- ~~The basis or starting point for procedure development (i.e., how the TA (see Section 18.4) and procedure development interrelate).~~

- ~~The content of procedures.~~

- ~~How the HSI style guide (see Section 18.7.6.1) integrates with the procedure writer's guide.~~

- ~~How procedures are verified and validated.~~

- ~~The justification for using electronic operating procedures instead of paper-based procedures.~~

18.8.2.1 ~~Procedure Writer's Guide~~

~~A procedure writer's guide is a necessary component of the procedure development program to establish consistency in organization, style, and content. This guide specifies which procedures fall within the purview of the guide. The procedure writer's guide and the HSI style guide (Section 18.7.6.1) are used concurrently while developing procedures that will provide consistency with terminology, abbreviations, and the use of component coding.~~

18.8.2.2 ~~Verification and Validation of Procedures~~

~~Both the electronic and paper-based procedures are verified and validated prior to the completion of the HSI design using a high-fidelity simulator and are used as input to the integrated system validation (ISV), see Section 18.10.3.5.~~

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18.8.2.3 ~~Electronic Procedures~~

~~Operating procedures are implemented in a screen-based format that provides access to process information by direct links. These electronic procedures also provide access to related information and direct the operator to the appropriate control screens. Refer to Section 6.2.9 of the U.S. EPR Human Factors Program Management Plan (Reference 1) for further details on the development of electronic procedures.~~

~~Paper-based procedures serve as backup to screen-based (i.e., electronic) procedures and contain the same guidance and format. Hard copy backups of operating procedures are provided in the main control room (MCR), remote shutdown station (RSS), and the Technical Support Center (TSC) in the event that a failure of the operating procedure computer occurs. Aside from differences in how electronic and hard copy procedures are used (i.e., the navigation and layout) as well as the availability of live data, electronic and hard copy procedures contain the same information in the same format. Adequate space is provided at appropriate workstations in the MCR and RSS for operators to display paper-based procedures, when required.~~

18.8.3 ~~Results~~

~~A results summary report addresses the final set of procedures developed using the established methodology. The results summary report includes:~~

- ~~The results of verification and validation (V&V) activities as they relate to procedure development.~~
- ~~How procedures will be maintained and updates controlled.~~
- ~~A description of how operators access and use procedures, especially during operational events including:~~
  - ~~Storage of procedures.~~
  - ~~Ease of operator access to the correct procedures.~~

18.8.4 ~~References~~

1. ~~U.S. EPR Human Factors Procedure Implementation Plan, AREVA NP Inc., 2009.~~

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Next File

18.9 Training Program Development

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Training plant personnel is an important factor in promoting the safe and reliable operation of a nuclear power plant. ~~A methodical analysis of job and task requirements and a Systematic Approach to Training (SAT) are used to provide plant personnel with required knowledge, skills, and attributes (KSA) to perform assigned tasks.~~

A COL applicant that references the U.S. EPR design certification will describe how HFE principles and criteria are incorporated into the development of training program scope, structure, and methodology.

18.9.1 ~~Objectives and Scope~~

~~Section 1.5 of the U.S. EPR Human Factors Training Implementation Plan (Reference 1) describes the objectives of the training program development as they relate to the HFE program.~~

~~An implementation plan describes training program scope including:~~

- ~~Categories of personnel to be trained (similar to the scope of analysis conducted for staffing, see Section 18.5.1).~~
- ~~Specific plant conditions, operational activities (e.g., operations, maintenance, testing and surveillance), and HSIs which effect training scenarios and methods.~~

18.9.2 ~~Methodology~~

~~Section 3.2.1 of the U.S. EPR Human Factors Training Implementation Plan (Reference 1) provides an outline of the design process used in developing a training program for the U.S. EPR.~~

~~Specific training objectives unique to the operation of the U.S. EPR are developed to coordinate with the HSI design process and the development of procedure guidelines. These training objectives are provided to each COL applicant referencing the U.S. EPR standard design for implementation into their site-specific training program.~~

18.9.3 ~~Results~~

~~A results summary report addresses the training program development including:~~

- ~~A description of the purpose and scope of training.~~
- ~~How the development process was conducted in accordance with the U.S. EPR Human Factors Training Implementation Plan.~~
- ~~The roles of organizations that contributed to the training program.~~

- ~~How learning objectives were developed and translated into the use of associated KSAs.~~
- ~~The use of resources (e.g., lectures, simulators, computer-based training, schedule) for training.~~
- ~~Methods used to evaluate effectiveness of the program.~~

18.9.4 ~~**References**~~

1. ~~U.S. EPR Human Factors Training Implementation Plan, AREVA NP Inc., 2009.~~

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