

ArevaEPRDCPEm Resource

From: Tesfaye, Getachew
Sent: Thursday, April 19, 2012 11:27 AM
To: 'usepr@areva.com'
Cc: Stutzcage, Edward; Schaaf, Robert; Jaffe, David; Segala, John; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 543 (6323), FSAR Ch. 14 - NEW PHASE 4 RAI
Attachments: RAI_543_RPAC_6323.doc

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on April 5, 2012, and discussed with your staff on April 18, 2012. Draft RAI Question 14.03.08-5 (e) was modified as a result of that discussion. 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/LB1
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 3884

Mail Envelope Properties (0A64B42AAA8FD4418CE1EB5240A6FED177BE57AFA7)

Subject: U.S. EPR Design Certification Application RAI No. 543 (6323), FSAR Ch. 14 -
NEW PHASE 4 RAI
Sent Date: 4/19/2012 11:26:53 AM
Received Date: 4/19/2012 11:26:53 AM
From: Tesfaye, Getachew

Created By: Getachew.Tesfaye@nrc.gov

Recipients:

"Stutzcage, Edward" <Edward.Stutzcage@nrc.gov>
Tracking Status: None
"Schaaf, Robert" <Robert.Schaaf@nrc.gov>
Tracking Status: None
"Jaffe, David" <David.Jaffe@nrc.gov>
Tracking Status: None
"Segala, John" <John.Segala@nrc.gov>
Tracking Status: None
"ArevaEPRDCPEm Resource" <ArevaEPRDCPEm.Resource@nrc.gov>
Tracking Status: None
"usepr@areva.com" <usepr@areva.com>
Tracking Status: None

Post Office: HQCLSTR02.nrc.gov

| Files | Size | Date & Time |
|-----------------------|-------------|------------------------|
| MESSAGE | 768 | 4/19/2012 11:26:53 AM |
| RAI_543_RPAC_6323.doc | 39418 | |

Options

Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Request for Additional Information No. 543(6323), Revision 0

4/19/2012

U. S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

SRP Section: 14.03.08 - Radiation Protection Inspections, Tests, Analyses, and Acceptance Criteria

Application Section: Tier 1, Section 2.2.8

QUESTIONS for Health Physics Branch (CHPB)

14.03.08-4

OPEN ITEM

New Phase 4 RAI

General Design Criterion 61 and 63 state that the fuel handling system shall be designed with suitable shielding for radiation protection and that a system is in place to initiate appropriate safety actions if a high radiation signal is detected.

SRP Section 14.3.8 states that, "the reviewer should ensure that Tier 1 identifies and describes, commensurate with their safety significance, those SSCs that provide radiation shielding, confinement or containment of radioactivity." FSAR Tier 1, Section 2.2.8 contains a description of the Fuel Handling System (FHS) and Table 2.2.8-2 lists the associated FHS ITAAC. In reviewing this section, staff noted that there is no description or ITAAC related to any electrical interlocks, limit switches, or mechanical stops which will be used to assure that a spent fuel assembly being transferred by either the refueling machine or the spent fuel handling machine will be maintained at a level under water appropriate to ensure a maximum dose rate of 2.5 mrem/hr to workers. This is consistent with ANSI/ANS-57.1-1992, which the applicant references. Therefore, please revise FSAR Tier 1 to include descriptions and ITAAC for the above information. This is consistent with the Tier 1 information contained in other designs.

In addition, FSAR Tier 2, Section 9.1.4.3.1 states that the spent fuel transfer machine is provided with a dose rate measurement device and limit switch that prevents farther lifting of a fuel assembly once a personnel dose rate of greater than 2.5 mrem/hour is reached. However, while FSAR Section 9.1.4.3.1 also states that the refueling machine is provided with a dose rate measurement device, and lifting is stopped in case of exceeding the allowable dose rate limit, it does not specify the dose limit at which the lifting will be stopped. Please specify at what dose rate to personnel the lifting of a fuel assembly by the refueling machine will be stopped and if there is a mechanical interlock which stops it, and include the information in FSAR Section 9.1.4.3.1.

14.03.08-5

OPEN ITEM

Follow up to RAI 386, Question Nos. 14.03.08-2 and 14.03.08-3.

Based on staff's review of Revision 3 of the U.S. EPR FSAR and the responses to RAI 386 and associated FSAR markups, the staff has the following items to be addressed related to the radiation monitors provided in Tier 1, Section 2.4-22:

- a. In the response to Question 14.03.08-3 the applicant provided an FSAR markup showing proposed changes to Table 2.4.22-2 in FSAR Revision 3. However, upon reviewing FSAR Revision 3 staff found that Table 2.4.22-2, "Radiation Monitoring System Equipment," provided different information than what was provided in the proposed FSAR markup. Specifically, it still lists the Containment High Range Dose Rate Monitors as being located in the "Reactor Building," instead of the "Containment Building," as was proposed in the response to Question 14.03.08-3. In order to more accurately describe the location of the monitors, please update the FSAR Tier 1, "Radiation Monitoring System Equipment" table, as described above.
- b. In response to Question 14.03.08-2 the applicant stated that information would be added to the U.S. EPR Tier 1 radiation monitoring ITAAC in the response to RAI 273, Question 11.05-02 and RAI 450, Question 14.03.07-37. However, these responses did not propose that any additional monitors will be added to Section 2.4.22 ITAAC. 10 CFR 52.47(b) requires that, the application must contain, "The proposed inspections, tests, analyses, and acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a facility that incorporates the design certification has been constructed and will be operated in conformity with the design certification, the provisions of the Act, and the Commission's rules and regulations." In addition, SRP Section 14.3 Appendix A, Section IV.4.B states that "The purpose of the ITAAC is to verify that an as-built facility conforms to the approved plant design and applicable regulations." Staff does not believe that all of the monitors necessary to ensure that a U.S. EPR facility will be constructed and operated in conformity with the design certification and with the Commission's rules and regulations are included in DCD Tier 1, Section 2.4.22. Specifically, Tier 1 Section 2.4.22 (including Table 2.4.22-3), does not include the spent fuel pool area radiation monitors, which are required by 10 CFR 50.68(b)(6), or the main control room air intake duct activity monitors, which are relied upon to initiate the engineered safety feature (ESF) of isolating and filtering the main control room air conditioning system upon detecting high activity.

Accordingly, the applicant is requested to include information and ITAACs for the U.S. EPR spent fuel radiation monitoring system in FSAR Tier 1 Section 2.4.22.

- c. FSAR Tier 1, Sections 2.4.1 and 2.4.22, contains ITAAC which will require licensee's to test parts of the RMS and the ESF associated with the RMS. However, staff cannot identify any information in Tier 1 indicating that the containment high range monitors will record and provide a readout of containment radiation levels in the main control room. 10 CFR 50.34(f)(xvii), requires that the containment high range monitors display this information in the MCR. Please update FSAR Tier 1, Section 2.4.1 or 2.4.22 to include information demonstrating that these monitors will provide containment radiation level information to the control room, as described above.
- d. FSAR Tier 1, Section 2.4.22, Table 2.4.22-3, Section 4.1, contains ITAAC indicating that tests will be performed on the RMS system to verify output signals. It is not clear whether these "tests" will include functional tests of the radiation detector, which is the essential component of the radiation monitoring channel. In the context of completing the ITAAC, the commitment described in FSAR Tier 1, Section 2.4.22, Item 4.2, should use the same type of radioactive calibration source's as are called for in FASR Tier 2, Rev. 1, Section 14.2.12.11.19 (Test #143) in

demonstrating the operational function of the channel (while ensuring that the source does not present a hazard and doses are kept ALARA during testing). This approach would confirm that the radiation monitoring channel operates in accordance with design commitments. Please update Section 2.4.22 ITAAC to include information ensuring that the radiation monitors listed within Tier 1 will be tested to verify the appropriate response to high radiation levels after installation.

- e. FSAR Tier 1, Sections 2.4.1 lists the ESF actions, including those that occur as a result of high activity levels in containment, the main steam lines, and the main control room air intake duct. This section also contains ITAAC ensuring that input signals to the protection system (PS) result in an reactor trip (RT) or ESF signal, as appropriate. However, it is not clear whether this test confirms the function of the radiation monitoring system (RMS) and PS as a whole. Revise FSAR Tier 1 to include ITAAC to verify that a test signal at the detectors (high activity levels, main steam lines and main control room air intake duct) results in the PS generating the correct ESF signal. The test should be performed on the system in its entirety, as opposed to in parts. This is particularly important since Section 14.2, Test #143 does not test that a signal at the RMS detectors results in an ESF signal, but instead only requires that the input to the PS is provided by the appropriate RMS radiation monitors. Revise Tier 1, of the FSAR such that the ITAAC provide assurance that activity levels at the containment monitors, main steam line monitors and the main control room air intake duct, result in the appropriate ESF signal.