

ArevaEPRDCPEm Resource

From: Clark, Phyllis
Sent: Thursday, January 22, 2015 5:42 PM
To: usepr@areva.com
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Subject: REF: US EPR DC FINAL RAI 630 RPAC (eRAI 7716).docx
Attachments: Final RAI 630 (eRAI 7716).docx

Attached please find the final subject requests for additional information (RAI) 630 (eRAI 7716) regarding your application for standard design certification of the U.S. EPR. A revised draft of the RAI was provided to you on December 19, 2014. Your email dated December 29, 2014 stated that no clarification phone call was required on this RAI. Therefore, the questions in this RAI remain unchanged from the revised draft version.

The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. Additionally, please make sure to include in your response letter a statement certifying whether or not your response contains any sensitive or proprietary information that needs to be withheld from public disclosure.

Sincerely,

Phyllis Clark

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Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 4881

Mail Envelope Properties (320204600EA7B9408FE833FF15E4FF7D021147A3437F)

Subject: REF: US EPR DC FINAL RAI 630 RPAC (eRAI 7716).docx
Sent Date: 1/22/2015 5:42:19 PM
Received Date: 1/22/2015 5:42:40 PM
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Files	Size	Date & Time
MESSAGE	1268	1/22/2015 5:42:40 PM
Final RAI 630 (eRAI 7716).docx		36145

Options

Priority: Standard

Return Notification: No

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Sensitivity: Normal

Expiration Date:

Recipients Received:

Final Request for Additional Information 630

Issue Date: 01/22/2015

Application Title: U. S. EPR Standard Design Certification - Docket Number 52-020

Operating Company: AREVA NP Inc.

Docket No. 52-020

Review Section: 11.05 - Process and Effluent Radiological Monitoring Instrumentation and Sampling Systems

Application Sections (Tier 1): 1.1, 2.4.22, 2.6.1, 2.6.4, 2.6.5, 2.6.6, 2.6.10, 2.6.8, 2.8.7, 2.9.1, 2.9.3, and 2.9.4

QUESTIONS

11.05-30

Tier 1 Related Sections: 1.1, 2.4.22, 2.6.1, 2.6.4, 2.6.5, 2.6.6, 2.6.10, 2.6.8, 2.8.7, 2.9.1, 2.9.3, and 2.9.4

The following presents staff observations noted during the review of U.S. EPR FSAR Rev. 5, Tier 1 and 2 topics forming the basis of ITAAC. The review used FSAR Rev. 5 as the focal point and refers to earlier staff Tier 1 RAs, as supporting background, in determining compliance with Part 52 requirements. Some of the information was provided again in Rev. 7, and the staff reviewed the information below against the newer revision. The listing addresses those aspects of the designs that are safety significant features and credited to comply with NRC regulations, including 10 CFR Part 20. For example, safety-significant radiation protection features credited to comply with 10 CFR Part 20 were selected for systems that automatically terminate or divert effluent releases to the environment or that significantly contribute to controlling effluent releases, effluent concentrations in unrestricted areas, and doses to members of the public. The associated regulatory requirements are contained in 10 CFR Part 20.1301 and 20.1302, and Part 20, Appendix B, Table 2 effluent concentration limits, as well as avoiding unmonitored and uncontrolled radioactive releases to the environment in response to Part 20.1406(b). The applicant should ensure that there is sufficient information in FSAR Tier 1 and that ITAAC are readily inspectable and compliance can be demonstrated with no ambiguity.

The review addresses FSAR Tier 2, Rev. 7, Section 14.3.2 (Tier 1, Chapter 2, System Based Design Descriptions and ITAAC) and FSAR Tables 14.3-2, 14.3-7, and 14.3-8, and Tier 1 related sections. The Tier 1 sections covered by this review and RAs include (but are not limited to) Sections 1.1, 2.6.6, 2.6.8, 2.8.7, 2.9.1, and 2.9.4. The question relating to Section 1.1 involves changes to Sections 2.4.22, 2.6.1, 2.6.4, 2.6.5, 2.6.10, 2.8.7, 2.9.1, and 2.9.3. As a result, using the observations noted below, this supplemental RA supersedes and subsumes currently open RAs on ITAAC associated with radiation monitoring instrumentation. Consequently, the following RAs are closed: RAI 307 (eRAI 3816), RAI 292 (eRAI 3718), RAI 527 (eRAI 6180) and RAI 562 (eRAI 6825). The disposition of RAI 557 (eRAI 6690) is being addressed separately in tandem with RAI 554 (eRAI 6572) as these RAs address the assignment of safety classifications to radwaste management systems and structures housing such systems under the provisions of Regulatory Guide 1.143, and subsequent assignment of ITAAC in complying with industry codes and standards for the construction of the radwaste processing building.

The applicant is requested to review staff observations listed below and make appropriate corrections, as needed.

1. Conduct of Tests and Description of Test

A review of FSAR Tier 1, Section 1.1 and ITAAC for systems indicates that test signals will be used to confirm the operability of systems equipped with radiation detectors. However, there is no information in the definition section as to how the test will be conducted and what means will be used to generate an elevated radioactivity signal in an automatic control function or for an operator take a specific action. Given that there are several means of initiating test signals, there is a need to provide more specificity in the definition and application of "test signals" used in ITA and AC for systems that rely on radiation detectors.

In its review, the staff noted that while the following Tier 1, Rev. 7, sections use specific wording... "A test will be performed..." with respect to the identified radiation monitors, the information describing equipment and system performance, commitment wording, ITA commitments, and acceptance criteria were found to be incomplete and inconsistent. This observation applies to the following Tier 1, Rev.7, sections:

1. FSAR Tier 1, Rev. 7, Section 2.4.22, Table 2.4.22-3 for commitment wording 4.5 and 4.6
2. FSAR Tier 1, Rev. 7, Section 2.6.1, Table 2.6.1-3 for commitment wording 6.7
3. FSAR Tier 1, Rev. 7, Section 2.6.4, Table 2.6.4-3 for commitment wording 7.5 and 7.6
4. FSAR Tier 1, Rev. 7, Section 2.6.5, Table 2.6.5-3 for commitment wording 5.2
5. FSAR Tier 1, Rev. 7, Section 2.6.6, Table 2.6.6-3 for commitment wording 7.3
6. FSAR Tier 1, Rev. 7, Section 2.6.10, Table 2.6.10-2 for commitment wording 4.1
7. FSAR Tier 1, Rev. 7, Section 2.8.7, Table 2.8.7-3 for commitment wording 4.4
8. FSAR Tier 1, Rev. 7, Section 2.9.1, Table 2.9.1-3 for commitment wording 4.2 and 4.4
9. FSAR Tier 1, Rev. 7, Section 2.9.3, Table 2.9.3-3 for commitment wording 7.2

The staff requests the applicant to specify how the high radioactivity signals will be generated, such as by using built-in check sources or by introducing calibration sources to verify that the stated automatic actions are confirmed. Specificity is

required because the use of a "test signal" could be interpreted as the equivalent of an electronic functional channel check and that the use of such a "simulated test signal" would not confirm the proper function of a radiation detector since it is the essential component in any radiation monitoring channel.

2. Safeguard Building Controlled-Area Ventilation System, FSAR Tier 1, Rev. 7, Section 2.6.6

In Table 2.6.6-3 for Commitment Wording 7.3, the staff notes an incomplete wording of the acceptance criteria. For the last sentence, "The isolation dampers close or open within 60 seconds after receipt of a high radioactivity signal." The staff requests a change to the description of this acceptance criterion to reflect the exact actions needed to occur within 60 seconds of the receipt of a high radioactivity signal. Currently, the description reflects that either opening or closure of any isolation damper meets the acceptance criteria, not the opening or closure of specific isolation dampers.

3. Containment Building Ventilation System, FSAR Tier 1, Rev. 7, Section 2.6.8

In review of Tier 1, Rev. 7, Section 2.6.8 the staff notes that there is no discussion of ITAAC addressing the testing of the radiation monitors used to provide indications to operators for the purpose of initiating the isolation of the containment building. In a review of FSAR Tier 2, Rev. 7, Section 11.5.3.1.4, the staff finds that radiation monitors R-7, R-8, and R-9 provide local and control room indication and alarms for the CBVS – Low Flow Purge. The staff requests the applicant to verify the necessity of having ITAAC developed for radiation monitors R-7, R-8, and R-9 since the functional operation of these monitors is necessary information for operators to initiate the emergency push button actions detailed in Tier 1, Rev. 7, Section 2.6.8. As part of this step, the applicant is requested to update the descriptions and tables of Tier 1, Rev. 7, Section 2.6.8 to accurately capture the ITAAC for these radiation monitors including, but not limited to the updates of Tables 2.6.8-2 and 2.6.8-3.

4. Steam Generator Blowdown System, FSAR Tier 1, Rev. 7, Section 2.8.7

In review of Tier 1, Rev. 7, Section 2.8.7 the staff has observed that there are ITAACs included in Table 2.8.7-3 to confirm proper component actuation upon detecting high radioactivity and high temperature signals. Based on a review of Table 2.8.7-3 it is not clear if there are ITAAC in place that would test the receipt and component actuation of simultaneous signals from both high radioactivity and high temperature signals in protecting demineralizers and preventing a slug release of radioactivity contained in spent-resins, and contaminating systems and components located downstream. Given that Tier 1, Rev. 7, Section 2.8.8 (Steam Generator Blowdown Demineralizer System) has no Tier 1 entries, the staff requests that the applicant consider the assignment of ITAAC that would test the receipt of a high radioactivity signal in addition to a high temperature signal in confirming proper system actuation in preventing the contamination of downstream components and uncontrolled release of radioactivity.

5. Radioactive Waste Management System, FSAR Tier 1, Rev. 7, Section 2.9.1

In review of FSAR Tier 1, Rev. 7 Section 2.9.1 staff has identified a discrepancy in the radiation monitor referenced in the section. Upon a review of FSAR Tier 2, Rev. 7, Section 11.5, Table 11.5-1, the staff sees that R-31 is a monitoring point for the Access Building Ventilation System. Upon further review of Tier 1, Table 2.9.1-2 the staff observes the appropriate tag number corresponding to Detector R-31 should be instead tag number R-32, as assigned to the LWMS based on FSAR Tier 2, Table 11.5-1. This observation indicates that the intended radiation monitor for Tier 1, Section 2.9.1 is R-32, which is the radiation monitoring point for the Liquid Radwaste Effluent System. The staff requests the applicant to review this discrepancy and correct the tag number for this radiation monitor in Tier 1, Section 2.9.1.

6. Sampling Activity Monitoring System, FSAR Tier 1, Rev. 7, Section 2.9.4

In review of FSAR Tier 1, Rev. 7, Section 2.9.4 staff notes that there are no ITAAC on the instrumentation that isolate the control room ventilation system upon detecting elevated levels of radioactivity in the main control room ventilation intake. A review of FSAR Tier 2, Rev. 7, Table 11.5-1 indicates that radiation monitors R-29 and R-30 perform such automatic control functions. Based on review of Rev. 7, the staff notes that the information in text and tables to support this ITAAC have been removed. The staff notes that there is no information given in the subsection on 'Equipment and System Performance,' for radiation monitors R-29 and R-30. The staff requests that the applicant provide the ITAAC to confirm the proper operation of the initiating function of the HVAC system in isolating the main control room and diverting the ventilation flow to iodine and filter trains upon receiving an elevated radioactivity signal. The applicant is requested to review and revise the information presented in Section 2.9.4, and Tables 2.9.4-1, 2.9.4-2, and 2.9.4-3 to reflect these design features.

7. Testing the function of monitors from sensor to actuation (RAI 562 follow-up)

10 CFR 52.47(b)(1) requires that applications contain, "the proposed inspections, tests, analyses, and acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analysis 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 the response to RAI 562 (Question 14.03.08-6), the applicant indicated that they would include ITAAC which tests the function of radiation monitors with a safety function, from the point of detection of radiation through actuation, of the affected component, and that additional information, including FSAR changes, would be made in the response to RAI 527, Question 14.03.07-38.

Currently, the ITAAC test the radiation monitor function through a series of tests in various sections of Tier 1, which do not appear to adequately overlap all components in the entire system and do not appear to ensure that the system will function as a whole. Therefore, staff does not believe the ITAAC currently provided in the FSAR adequately ensure compliance with 10 CFR 52.47(b)(1).

Since RAI 527 is subsumed by this RAI, staff requests that the additional information the applicant indicated that they would provide in response to RAI 527 (including FSAR markups), will be provided in the response to this RAI. Please see RAI 562 and its response for additional information.