ArevaEPRDCPEm Resource

From: Tesfaye, Getachew
Sent: Friday, October 09, 2009 12:45 PM
To: 'usepr@areva.com'
Cc: Dehmel, Jean-Claude; Frye, Timothy; Ng, Ching; Dixon-Herrity, Jennifer; Jennings, Jason; Miernicki, Michael; ArevaEPRDCPEm Resource
Subject: Draft - U.S. EPR Design Certification Application RAI No. 307 (3816, 3777), FSAR Ch. 14
Attachments: Draft RAI_307_CHPB_3816_EMB2_3777.doc

Attached please find draft RAI No. 307 regarding your application for standard design certification of the U.S. EPR. If you have any question or need clarifications regarding this RAI, please let me know as soon as possible, I will have our technical Staff available to discuss them with you.

Please also review the RAI to ensure that we have not inadvertently included proprietary information. If there are any proprietary information, please let me know within the next ten days. If I do not hear from you within the next ten days, I will assume there are none and will make the draft RAI publicly available.

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

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 863

Mail Envelope Properties (0A64B42AAA8FD4418CE1EB5240A6FED1026AB8902B)

Subject: Draft - U.S. EPR Design Certification Application RAI No. 307 (3816, 3777), FSAR Ch. 14
Sent Date: 10/9/2009 12:45:06 PM
Received Date: 10/9/2009 12:45:07 PM
From: Tesfaye, Getachew

Created By: Getachew.Tesfaye@nrc.gov

Recipients:
"Dehmel, Jean-Claude" <Jean-Claude.Dehmel@nrc.gov>
Tracking Status: None
"Frye, Timothy" <Timothy.Frye@nrc.gov>
Tracking Status: None
"Ng, Ching" <Ching.Ng@nrc.gov>
Tracking Status: None
"Dixon-Herrity, Jennifer" <Jennifer.Dixon-Herrity@nrc.gov>
Tracking Status: None
"Jennings, Jason" <Jason.Jennings@nrc.gov>
Tracking Status: None
"Miernicki, Michael" <Michael.Miernicki@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	722	10/9/2009 12:45:07 PM
Draft RAI_307_CHPB_3816_EMB2_3777.doc	45050	

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

Draft

Request for Additional Information No. 307 (3816, 3777), Revision 1

10/9/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 14.03 - Inspections, Tests, Analyses, and Acceptance Criteria
SRP Section: 14.03.03 - Piping Systems and Components - Inspections, Tests, Analyses, and Acceptance Criteria

Application Section: 14.3

QUESTIONS for Health Physics Branch (CHPB)
QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR Projects) (EMB2)

14.03-14

A review of FSAR Tier 2, Rev. 1, Section 14.3.2; FSAR Section 11.5; and FSAR Tier 1, Rev. 1, Section 2.0, indicates that the treatment of ITAACs has been divided in two groups, certified design material (CDM), and Inspection, Test, Analysis, and Acceptance Criteria (ITAAC). CDM binds the design commitment of structure, system, and components for the lifetime of the facility, and ITAACs are used to verify the as-built features of the plant. FSAR Tier 1, Rev. 1, Section 14.3.2 assigns ITAACs based on (a) the classification of systems and equipments, and (b) on systems identified during key safety and integrated plant safety analyses for the purpose of preserving specific design features in the as-built facility. Systems described in FSAR, Tier 2 sections that have no safety significant features or that were not identified as part of the "key safety and integrated plant safety analyses" process are listed in Tier 1 as "No entry for this system." Although the selection process identifies pertinent NRC regulations for safety related design features, FSAR Tier 1, Section 2.9 does not identify ITAACs associated with plant systems and components used to treat process and effluent or waste streams and monitor and/or control radioactivity releases in the environment in demonstrating compliance with 10 CFR Part 20, Appendix B, Table 2 liquid and gaseous effluent concentration limits; and doses to members of the public under 10 CFR Parts 20.1301 and 20.1302, as well as avoiding unmonitored and uncontrolled radioactive releases to the environment in response to Part 20.1406(b).

Plant systems described in FSAR Tier 2, that are used to demonstrate compliance with Part 20 requirements, include the liquid waste management system (LWMS, Section 11.2), the gaseous waste management system (GWMS, Section 11.3), and the process and effluent radiological monitoring and sampling systems (PERMSS, Section 11.5). Plant systems used to treat and process wet and solid wastes in accordance with Part 61 and 20 include the solid waste management system (SWMS, Section 11.4). FSAR Tier 1, Section 2.9 places these systems in the "No entry for this system" category, and the PERMSS is not identified in FSAR Tier 1, Section 2.9. The ITAACs assigned to the radiation monitoring systems, FSAR Tier 1, Rev. 1, Section 2.4.22, are for safety-related functions in protecting control room personnel, and for isolating the containment on a receipt of a signal from the containment high range radiation monitor. The ITAACs

assigned to the sampling activity monitoring systems, FSAR Tier 1, Rev. 1, Section 2.9.4, are safety-related functions for the protection of personnel in the control room and its isolation upon receipt of a high radiation signal by the control room air intake radiation monitor. This ITAAC is also used to confirm the alarm functions of the plant stack radiation monitor in the control room upon receipt of a high radiation signal.

The staff evaluation of the applicant's responses to prior RAIs (RAI No. 43, 105, and 116) indicates that the approach being used in addressing ITAAC is based on previous certified designs and that the EPR FSAR Tier 1 incorporates safety significant features credited to comply with the requirements of 10 CFR Parts 20, 50, 52, 73, or 100. However, 10 CFR Part 52.47(b)(1) states that a design certification application must contain the following:

> *"The proposed inspections, tests, and analyses, …that the licensee shall perform, and the 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 combined license, the provisions of the Act, and the Commission's rules and regulations."*

The staff concludes that Tier 1 safety significant radiation protection structures, systems and components (SSC), which the applicant has credited for complying with the requirements of 10 CFR Part 20, do not contain sufficient detail to provide reasonable assurance that the facility will be constructed and operated in accordance with the Commission's rules and regulations, specifically 10 CFR Part 20 and GDC 64. For this reason, RG 1.206 Part C.II states that some level of Tier 1 and ITAAC detail should be provided for SSCs which demonstrate compliance with 10 CFR Part 20, although they are not safety-related SSCs. As an example, the AP1000 certified design which the applicant referenced in its response to RAI 43, Question 14.3.8-1, has recognized this and, therefore, includes Tier 1 information and ITAAC for several of the following SSCs relevant to demonstrating the design's compliance with 10 CFR Part 20 and GDC 64 in accordance with 10 CFR Part 52.47(b)(1). Similarly, the ESBWR Design Certification Document (Rev. 6) includes specific ITAACs for such systems. The staff maintains that while these specific systems differ somewhat in nomenclature, they are equivalent in purpose and safety significance to corresponding systems in the U.S. EPR design, for which FSAR Tier 1, Rev. 1 does not provide equivalent ITAACs.

As part of the acceptance review process, the staff noted that Tier 1 topics and ITAACs of the U.S. EPR FSAR (Rev. 0) did not include 10 CFR Part 20 as part of the screening criteria, consistent with Section 14.3.7 of the Standard Review Plan and Regulatory Guide 1.206 Part C.II. This was identified as a significant deficiency in the application and it was communicated to the applicant in the letter signifying acceptance and docketing of the application (ML080380357). In accepting the application, the staff relied in part on commitments made by AREVA in letters dated February 7 and 20, 2008, which included a commitment to include 10 CFR Part 20 in the screening criteria delineated in FSAR Section 14.3.7.

In the context of plant systems that are used to treat process and effluent streams, process wet and solid wastes, and monitor and control radioactive liquid and airborne effluent releases, the following systems should include Tier 1 information and ITAACs in demonstrating compliance with NRC regulations:

a. Liquid process and effluent control and monitoring, including design features used for the automatic isolation and termination of liquid effluent streams from the LWMS

b. Gaseous and airborne process and effluent control, including design features used for the automatic isolation, diversion, and termination of process and airborne effluent streams from the GWMS and all building ventilation systems servicing radioactive systems and radiologically controlled areas

c. Liquid and gaseous process control and monitoring, including design features used for the automatic isolation and termination of process streams from the SWMS

d. Process and effluent monitoring and sampling systems used for normal operations and anticipated operational occurrences, including subsystems used to monitor the performance of the LWMS, GWMS, and SWMS (expressed as decontamination factors, holdup times, or removal efficiencies), and control liquid and airborne effluent releases from all release points

It is recognized that the level of Tier 1 and ITAAC details for these systems will be less than that required for safety related SSCs. However, without sufficient details the staff cannot complete its evaluation and conclude, with reasonable assurance, that if the tests and inspections were performed and acceptance criteria were met, that all design commitments will be fulfilled and that the plant will be built and operated in accordance with the design certification and comply with applicable NRC regulations. Accordingly, the applicant is requested, at a minimum, to provide Tier 1 information and ITAACs for U.S. EPR systems corresponding to those listed above, and for any other systems associated with radioactive liquid and gaseous effluents.

14.03.03-45

Follow-up to RAI Question 14.03.03-32

In the response to RAI 14.03.03-32 dated July 24, 2009, AREVA revised FSAR Tier 2 Section 14.3 to include a discussion of construction ITAAC and design ITAAC. The ASME Code Section III piping design was identified as an example of design ITAAC that establish the commitment for completing the design of an SSC. An acceptable methodology to be used by for the design is described in other sections of EPR FSAR Tier 2. The applicant also indicated that there can be three scenarios for closing design ITAAC: 1) closure through amendment of design certification rule; 2) closure through the COL review process; and 3) closure after COL issuance. The requirement to submit a schedule for ITAAC closure is the responsibility of the COL applicant. A new COL Information Item 14.3-3 was added in Section 14.3 indicating that the COL applicant will identify a plan for implementing design ITAAC. The plan includes the evaluations that will be preformed, the schedule for performing these evaluations, and associated processes and information that will be available for NRC audit. Plans for SCOL applicants/licensees may apply that the design ITAAC completion used for first standard plant. In the included FSAR markup of Table 1.8-2, AREVA indicated that COL Information Item 14.3-3 is an action required by COL Holder.

Even though AREVA had substantiated the discussion about the use of ITAAC and COL Information Item, the staff found the response to be insufficient in addressing the process of using Design Acceptance Criteria in lieu of completing the piping design.

The staff has identified following concerns:

1. The applicant introduced the term Design ITAAC, which can be closed under three scenarios. Descriptions of these scenarios are the same as those in Section 8.3.1 of NEI 08-01 Revision 3, "Industry Guideline for the ITAAC Closure Process Under 10 CFR Part 52," for closing Design Acceptance Criteria (DAC). However, AREVA has not indicated in the application that DAC will be used in piping design area. These special ITAAC could be acceptable because piping design is one of the areas allowed to use DAC during the staff's review of design certifications and subsequent safety determination. According to SECY Paper 92-053 and its associated Staff Requirement Memorandum, the NRC implemented the policy of accepting the use of DAC in lieu of detailed design information in a limited number if design areas on a case-by-case basis, as requested by the design certification applicants. Again as in the previous RAI, AREVA is requested to indicate in the EPR FSAR Tier 2 that DAC will be used in lieu of detail design information for piping design.

2. The staff disagreed that the COL Information Item 14.3-3 to be completed by "COL Holder" as identified in Tier 2, Table 1.9-2. It is believed that the COL applicant referencing US EPR design certification should provide the plan for the staff to make the safety determination prior to the issuance of the license. The staff requests AREVA to revise the wording in Section 14.3 to address these issues.

3. In the COL information Item 14.3-3, AREVA indicated that the plan the COL applicant provided will identify the evaluations to be performed. The staff agreed that the COL applicant will provide the details of the evaluations. However, for piping design, the staff found that AREVA needs to specify what those evaluations are. In particular, AREVA should indicate what was not completed in the FSAR and how those evaluations relate to specific design ITAAC. The staff requested AREVA to include a separate paragraph or section in Tier 2 Section 14.3 to discuss the specific of piping DAC and associated design ITAAC for piping design reports, as-built reconciliation, and/or other piping areas (possibly as-designed pipe break hazard analysis).

4. For the COL information Item 14.3-3, AREVA indicated that for subsequent plants, the plan may be an indication that the plant will apply the design ITAAC completion that was used for the first standard plant. The staff agrees that the piping design completed for the first plant will be available to subsequent plants for closure of the design ITAAC under the "one issue-one review-one position" approach if the same standard piping design will be used by this particular COL applicant. Thus, the staff requests the applicant amend the statement to illustrate that referencing the completed design ITAAC only applies if a standard piping design used.