

## ArevaEPRDCPEm Resource

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**From:** Tesfaye, Getachew  
**Sent:** Monday, April 04, 2011 9:57 PM  
**To:** 'usepr@areva.com'  
**Cc:** McNally, Richard; Hsu, Kaihwa; Hsia, Anthony; Dixon-Herrity, Jennifer; Strnisha, James; Terao, David; Miernicki, Michael; Clark, Phyllis; Colaccino, Joseph; ArevaEPRDCPEm Resource  
**Subject:** Draft - U.S. EPR Design Certification Application RAI No. 481 (5642,5664,5587,5622), FSAR Ch. 3  
**Attachments:** Draft RAI\_481\_EMB2\_5642\_5664\_CIB1\_5587\_NWE1\_5622.doc

Attached please find draft RAI No. 481 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,  
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Request for Additional Information No. 481(5642, 5664, 5587, 5622), Revision 0

4/4/2011

U. S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

SRP Section: 03.02.01 - Seismic Classification

SRP Section: 03.02.02 - System Quality Group Classification

SRP Section: 03.11 - Environmental Qualification of Mechanical and Electrical Equipment

SRP Section: 03.12 - ASME Code Class 1, 2, and 3 Piping Systems and Piping Components and Their Associated Supports

Application Section: FSAR Ch 3

QUESTIONS for Engineering Mechanics Branch 2 (ESBWR/ABWR Projects) (EMB2)  
QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects)  
(CIB1)

QUESTIONS for AP1000 Projects Branch 1 (NWE1)

03.02.01-18

FSAR Rev.2 Section 3.2.1 states that to meet the requirements of both GDC 2 and 10 CFR 50, Appendix S with regard to the design for earthquakes, U.S. EPR SSC are seismically classified in accordance with RG 1.29. Also, Table 1.9-2 of the FSAR Tier 2 states that that the U.S. EPR complies with RG 1.29, Revision 4. RG 1.29 regulatory position C.1.c. identifies that the systems that are required for post accident containment atmosphere cleanup (e.g., hydrogen removal system) are designated as Seismic Category I and must be designed to withstand the effects of the SSE and remain functional. However, FSAR Table 3.2.2-1 identifies that the Passive Autocatalytic Recombiners in the Combustible Gas Control System are classified as Seismic Category II rather than Seismic Category I. Describe the basis for the seismic classification of the Passive Autocatalytic Recombiners as Seismic Category II and clarify why this classification is consistent with RG 1.29 or revise the FSAR to show this as an exception to RG 1.29 and justify the acceptability of this exception.

03.02.02-13

EPR FSAR Revision 2 Table 3.2.2-1 revised in response to RAI 09.01.04-14 shows the RPV Refueling Cavity Seal as NS-AQ (Supplemented Grade), Quality Group D and Seismic Category I with a 10 CFR 50 Appendix B Program applied. NRC Staff concurs that Seismic Classification as Seismic Category I with QA to 10 CFR 50 Appendix B is consistent with a safety-related SSC and RG 1.29 and RG 1.13. However, the QG D classification for a nonsafety-related component is inconsistent with the seismic Category I classification. The following basic safety function and related classification concerns are to be addressed by AREVA:

- A. Clarify if the refueling cavity seal is a mechanical or a structural component and describe the extent that codes and standards are applied.
  - I. If considered a structural component, Quality Group should not apply and the structural branch is to review.
  - II. If considered a mechanical component, describe the extent of certification and stamping and explain why this component is classified as QG D rather than QG C. A component designed to ASME Section III Subsection ND is normally designated as QG C.
- B. The basis for the classification as QG D has not been justified. In particular the following information is needed to evaluate.
  - I. Establish if the seal is defined as safety-related or important to safety using the definitions in 10 CFR 50 and Appendix A
  - II. Describe the safety function and the basis for the designation as safety-related, important to safety or nonsafety-related.
  - III. Since the seal is classified as Seismic Category I that is normally used for safety-related SSCs, explain why the seal classified as QG D is not also considered safety-related.
  - IV. If the seal is considered safety-related, the basis for the classification as QG D should be described.
  - V. If the seal is defined as nonsafety-related, but is important to safety concerning the risk to health and safety of the public, describe the evaluation of risk-significance.
  - VI. If the seal is not postulated to fail, justify why a single failure (rupture or crack) is not postulated to occur with consideration of specified quality requirements.
  - VII. If the seal could fail or leak as a postulated passive failure during refueling operations explain why the seal failure will not result in excess off-site doses (ref. RG 1.26 Regulatory Position C.2.(d)).

03.11-39

Section 3.11.2.2 of the U.S. EPR FSAR states, "For mechanical equipment located in a mild environment, acceptable environmental design is demonstrated by the design and purchase specifications for the equipment. The specifications contain a description of the functional requirements for a specific environmental zone during normal environmental conditions and anticipated operational occurrences. The maintenance and surveillance programs provide assurance that the qualified status of the equipment is maintained, by performing required activities upon which the qualification is based, including those activities necessary to extend the qualified life period to the plant life period, which could involve replacement."

The following paragraph in Section 3.11.2.2 of the U.S. EPR FSAR states, "The operational program that supports implementation of the Maintenance Rule (10 CFR 50.65) and RG 1.160 monitors the effectiveness of maintenance at the plant, and therefore provides assurance that the material degradation related to environmental considerations established during design are maintained on a continuing basis. Equipment is monitored, and equipment that does not meet performance criteria is evaluated, corrective actions identified, and identified for continued monitoring. As noted in Section 17.6, a COL applicant that references the U.S. EPR design certification is responsible for implementing the Maintenance Rule program."

NRC staff does not consider the Maintenance Rule (10 CFR 50.65) and RG 1.160 to provide sufficient detail to maintain the EQ status of safety-related mechanical and electrical equipment. In order to maintain the EQ status of safety-related equipment during the operational life of the plant, maintenance and surveillance programs are to contain attributes as described in FSAR Section 3.11.2.2.6, "Maintaining Mechanical Equipment Qualification." The NRC staff requests the applicant to revise sections of the FSAR to describe that maintenance and surveillance programs as described in Section 3.11.2.2.6 provide assurance that the EQ status of safety-related equipment located in both mild and harsh environments is adequately maintained.

NRC staff request the applicant to revise the first paragraph to state, "The maintenance and surveillance programs as described in Section 3.11.2.2.6 provide assurance that the qualified status of the mechanical and electrical equipment is maintained, by performing required activities upon which the qualification is based, including those activities necessary to extend the qualified life period to the plant life period, which could involve replacement." NRC staff also requests the applicant to revise the second paragraph to state, "The operational program that supports implementation of the Maintenance Rule (10 CFR 50.65) and RG 1.160 monitors the effectiveness of maintenance at the plant and maintenance and surveillance programs as described in Section 3.11.2.2.6 provide assurance that the material degradation related to environmental considerations established during design are maintained on a continuing basis."

#### 03.12-25

In FSAR Table 1.8-2, Item 3.12-1, the applicant states that "A COL applicant that references the U.S. EPR design certification will perform a review of the impact of contributing mass of supports on the piping analysis following the final support design to confirm that the mass of the support is no more than ten percent of the mass of the adjacent pipe span".

The staff noted that the contributory support mass consideration in the piping system analysis model is a design requirement during design stage and as-built reconciliation. The staff noted that the mentioned design requirement is not a COL action item and there is no basis to limit that the contributory support mass has to be less than ten percent of the mass of the adjacent pipe span as stated in the item 3.12-1. The staff is requesting EPR to address this item.