

## ArevaEPRDCPEm Resource

---

**From:** Tesfaye, Getachew  
**Sent:** Friday, October 30, 2009 4:32 PM  
**To:** 'usepr@areva.com'  
**Cc:** Davis, Robert; Terao, David; Carneal, Jason; Colaccino, Joseph; ArevaEPRDCPEm Resource  
**Subject:** U.S. EPR Design Certification Application RAI No. 314 (3843), FSAR Ch. 6  
**Attachments:** RAI\_314\_CIB1\_3843.doc

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on October 21, 2009, and on October 30, 2009, 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:** 932

**Mail Envelope Properties** (0A64B42AAA8FD4418CE1EB5240A6FED102BDC47A46)

**Subject:** U.S. EPR Design Certification Application RAI No. 314 (3843), FSAR Ch. 6  
**Sent Date:** 10/30/2009 4:32:05 PM  
**Received Date:** 10/30/2009 4:32:04 PM  
**From:** Tesfaye, Getachew

**Created By:** Getachew.Tesfaye@nrc.gov

**Recipients:**

"Davis, Robert" <Robert.Davis@nrc.gov>  
Tracking Status: None  
"Terao, David" <David.Terao@nrc.gov>  
Tracking Status: None  
"Carneal, Jason" <Jason.Carneal@nrc.gov>  
Tracking Status: None  
"Colaccino, Joseph" <Joseph.Colaccino@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

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	805	10/30/2009 4:32:04 PM
RAI_314_CIB1_3843.doc	31226	

**Options**

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

Request for Additional Information No. 314 (3843), Revision 0

10/30/2009

U. S. EPR Standard Design Certification  
AREVA NP Inc.  
Docket No. 52-020  
SRP Section: 06.01.01 - Engineered Safety Features Materials  
Application Section: 6.1.1

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects)  
(CIB1)

06.01.01-19

In RAI 06.01.01-14(1) the staff requested that the applicant address potential thermal aging embrittlement of cast-austenitic-stainless-steel (CASS) components with service conditions above 482°F (250°). The applicant responded and stated that the NRC letter from C. Grimes (USNRC) to D. Walters (Nuclear Energy Institute) dated May 19, 2009 that was referenced by the staff in RAI 06.01.01-14(1) does not require the screening of valve bodies and pump casings, which are the only types of CASS components used in ESF systems. The staff acknowledges that the NRC letter states that screening is not necessary because ASME Section XI inservice inspection (ISI) requirements are an acceptable method to manage potential degradation in these components for 20 years of continued operation beyond the initial 40-year license, without the implementation of an aging management program. However, the NRC letter does not state or imply that these components are not susceptible to thermal aging. The staff considers CASS components (operating above 482° F) with 2.0 % to 3.0 % Mo and a ferrite content of less than or equal to 14% and CASS components (operating above 482° F) with 0.5 % Mo maximum and a ferrite content of less than or equal to 20% as not susceptible to thermal aging embrittlement if ferrite content is calculated using Hull's equivalent factors. However, the FSAR does not state that ferrite content will be kept below these levels. Therefore, the staff requests that the applicant modify FSAR Section 6.1.1 and Table 6.1-1 to limit the ferrite content of high Mo CASS components (2.0-3.0% Mo) to equal to or less than 14% and limit the ferrite content of low Mo CASS components (0.50% max Mo) to equal to or less than 20% using Hull's equivalent factors to calculate ferrite content for components operating above 482° F.

06.01.01-20

To comply with the requirements of GDC 14 as it relates to design, fabrication, erection, and testing of the RCPB so as to have an extremely low probability of abnormal leakage, or rapidly propagating failure, and of gross rupture, the ESF should have the same limits on harmful impurities as the RCS since the ESF systems interface with the RCS.

DCD Section 6.1.1.2 references DCD Section 5.2.3 for more details on RCS water chemistry. This implies that the water chemistry requirements for the ECCS systems are identical to those for the RCS. The staff notes that since the IRWST is part of the ESF,

which is open to the containment atmosphere, it may not be possible to control oxygen to low levels in the ESF systems. The staff also notes that the EPRI PWR Primary Water Chemistry Guidelines, Appendix B.6, provides guidelines for refueling water storage tanks. The staff requests that the applicant provide the water chemistry specification, including, but not limited to, limits on impurities such as chloride, fluoride, and sulfate, for the ESF systems, or clarify that the water chemistry specification for the ESF systems is identical to the RCS. The sampling frequencies for the parameters should also be provided. In addition, the staff requests that the applicant modify the FSAR as necessary to incorporate this information.

#### 06.01.01-21

The applicant's response to RAI 06.01.01-5, dated November 3, 2009, states that no ESF components are fabricated from Alloy 690 in the U.S EPR design which is inconsistent with U.S EPR FSAR Section 6.1.1.1 which discusses the use of Alloy 690 in ESF components. The staff requests that the applicant modify the FSAR to address this inconsistency.