

## ArevaEPRDCDocsPEm Resource

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**From:** RYAN Tom (AREVA) [Tom.Ryan@areva.com]  
**Sent:** Wednesday, January 15, 2014 8:53 AM  
**To:** Wunder, George  
**Cc:** Takacs, Michael; HOTTLE Nathan (AREVA); GUCWA Len (EXTERNAL AREVA); UYEDA Graydon (AREVA); RANSOM Jim (AREVA); LEIGHLITER John (AREVA); WILLIFORD Dennis (AREVA); RYAN Tom (AREVA); ROMINE Judy (AREVA); DELANO Karen (AREVA); WILLS Tiffany (AREVA); MUSGRAVE Jennifer (AREVA); BALLARD Bob (AREVA); WATKINS Stan (AREVA); RYAN Tom (AREVA)  
**Subject:** Response to US EPR DC FINAL RAI 604, Chapter 14, Section 14.03.07 - Plant Systems - Inspections, Tests, Analyses, and Acceptance Criteria, Supplement 1  
**Attachments:** RAI 604 Supplement 1 Response US EPR DC.PDF

George,

The attached file, "RAI 604 Supplement 1 Response US EPR DC.pdf," provides a technically correct and complete FINAL response to Question 14.03.07-40. Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the final response to RAI 604, Question 14.03.07-40.

The following table indicates the respective pages in the response document, "RAI 604 Supplement 1 Response US EPR DC.pdf," that contain AREVA's response to the subject question.

Question #	Start Page	End Page
RAI 604 — 14.03.07-40	2	3

This completes the formal AREVA response to RAI 604. There are no additional questions associated with this RAI.

Sincerely,

**Tom Ryan**

Manager, US EPR DCD

Regulatory Affairs

**AREVA**

7207 IBM Drive - CLT2B

Charlotte, NC 28262

Phone: 704-805-2643, Cell : 704-292-5627

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**From:** HOTTLE Nathan (EP/PE)  
**Sent:** Monday, October 21, 2013 5:28 PM  
**To:** [michael.miernicki@nrc.gov](mailto:michael.miernicki@nrc.gov)  
**Cc:** 'Takacs, Michael'; GUCWA Len (External RS/NB); UYEDA Graydon (EP/PE); RANSOM Jim (RS/NB); LEIGHLITER John (RS/NB); KOWALSKI David (RS/NB); MUSGRAVE Jennifer (CORP/IND); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)  
**Subject:** Response to US EPR DC FINAL RAI 604, Chapter 14, Section 14.03.07 - Plant Systems - Inspections, Tests, Analyses, and Acceptance Criteria

Mike,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 604 Response US EPR DC.pdf," provides a schedule since a technically correct and complete response to the single question cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 604 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 604 — 14.03.07-40	2	2

The schedule for a technically correct and complete response to the question is provided below.

Question #	Advanced Response Date	NRC Comment Request Date	Final Response Date
RAI 604 — 14.03.07-40	December 13, 2013	January 24, 2014	<b>February 7, 2014</b>

Sincerely,

*Nathan Hottle*

AREVA Inc.  
3315 Old Forest Road  
Lynchburg, VA 24501  
Phone 434-832-3864  
Mobile 434-485-4239  
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**From:** Snyder, Amy [<mailto:Amy.Snyder@nrc.gov>]  
**Sent:** Thursday, September 19, 2013 3:55 PM  
**To:** ZZ-DL-A-USEPR-DL  
**Cc:** Wheeler, Larry; Dias, Antonio; Buckberg, Perry; Takacs, Michael; Miernicki, Michael; Gleaves, Bill; Segala, John  
**Subject:** US EPR DC FINAL RAI 604, Chapter 14, Section 14.03.07 - Plant Systems - Inspections, Tests, Analyses, and Acceptance Criteria

Attached please find the subject request for additional information (RAI). A draft RAI was provided to you on September 05, 2013. On September 10, 2013, AREVA informed us that, the RAI is clear and does not contain proprietary information and that no further clarification is needed.

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 or October 21, 2013**, 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.

Thank You,

Amy

Amy

Amy Snyder, U.S. EPR Design Certification Lead Project Manager  
Licensing Branch 1 (LB1)

Division of New Reactor Licensing  
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**From:** Snyder, Amy

**Sent:** Thursday, September 05, 2013 3:32 PM

**To:** 'usepr@areva.com' ([usepr@areva.com](mailto:usepr@areva.com))

**Cc:** Wheeler, Larry; Dias, Antonio; Buckberg, Perry; Takacs, Michael; Miernicki, Michael; Gleaves, Bill; Segala, John

**Subject:** US EPR DC DRAFT RAI 604, Chapter 14, Section 14.03.07 - Plant Systems - Inspections, Tests, Analyses, and Acceptance Criteria

Attached please find Draft RAI No. 604 regarding your application for standard design certification of the U.S. EPR. If you have any questions or need clarification regarding this Draft 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 draft RAI to ensure that we have not inadvertently included proprietary information. If there is 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.

Thank You,

Amy

Amy Snyder, U.S. EPR Design Certification Lead Project Manager

Licensing Branch 1 (LB1)

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**Hearing Identifier:** AREVA\_EPR\_DC\_Docs\_Public  
**Email Number:** 81

**Mail Envelope Properties** (88F9B30A3139B1498DA89BEBA7B31B900B6FB754)

**Subject:** Response to US EPR DC FINAL RAI 604, Chapter 14, Section 14.03.07 - Plant Systems - Inspections, Tests, Analyses, and Acceptance Criteria, Supplement 1  
**Sent Date:** 1/15/2014 8:53:19 AM  
**Received Date:** 1/15/2014 8:53:47 AM  
**From:** RYAN Tom (AREVA)

**Created By:** Tom.Ryan@areva.com

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Tracking Status: None  
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Files	Size	Date & Time
MESSAGE	5500	1/15/2014 8:53:47 AM
RAI 604 Supplement 1 Response US EPR DC.PDF	187326	

**Options**

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

**Response to**

**Request for Additional Information No.604, Supplement 1**

**09/19/2013**

**U.S. EPR Standard Design Certification**

**AREVA Inc.**

**Docket No. 52-020**

**SRP Section: 14.03.07 - Plant Systems - Inspections, Tests, Analyses, and  
Acceptance Criteria**

**Application Section: 9.2.2 and 9.2.8**

**SRSB Branch**

**Question 14.03.07-40:**

The staff reviewed U.S. EPR Tier 1, FSAR Revision 5, Section 2.7.1, "Component Cooling Water System," and found the following discrepancies:

- Table 2.7.1-2 "CCWS Equipment I&C and Electrical Design", Sheet 4 of 8 (Page 2.7-14), column IEEE Class 1E<sup>(2)</sup> – valve 30KAB30AA056 has 2<sup>N</sup> and 2<sup>A</sup> divisions - division 1 appears to be missing.
- Table 2.7.1-3, "Component Cooling Water System ITAAC", ITAAC 7.3 (Page 2.7-28), Acceptance Criteria column – trains 1 and 4 flow rate of  $2.1906 \times 10^6$  lbm/hr is different from trains 2 and 3 flow rate of  $2.984 \times 10^6$  lbm/hr and does not agree with Tier 2, Table 9.2.2-2 which has a maximum flow rate of  $2.984 \times 10^6$  lbm/hr.

The staff reviewed U.S. EPR Tier 1, FSAR Revision 5, Section 2.7.2, "Safety Chilled Water System," and found the following discrepancies:

- In Section 3.0 "Mechanical Design Features," Items 3.3 and 3.5 appear to be the same ITAAC.
- Table 2.7.2-3 "SCWS Air Cooled Division Equipment Mechanical Design", Sheet 1 of 2 (Page 2.7-51), Column 'Tag Number' – need to check condenser fan # 21-24 and 35-38. In accordance with Figure 2.7.2-2, condenser fan tag numbers are #21-28.
- Table 2.7.2-3, Sheet 2 of 2 (Page 2.7-52), Column 'Tag Number' – need to check condenser fan # 21-24 and 35-38. In accordance with Figure 2.7.2-2, condenser fan tag numbers are #21-28.
- Table 2.7.2-4 "SCWS Air Cooled Division Equipment I&C and Electrical Design" (Page 2.7-53), Column 'Tag Number' – need to check condenser fan # 21-24 and 35-38. In accordance with Figure 2.7.2-2, condenser fan tag numbers are #21-28.
- Table 2.7.2-5 (Page 2.7-55 and -57), ITAACs 3.5 and 3.19 have the same wording.

Staff requests that AREVA clarify the above discrepancies.

**Response to Question 14.03.07-40:**

In the Response to RAI 505, Supplement 29, Question 07.01-35, the normal divisional powers for the component cooling water system (CCWS) containment isolation valves (CIVs) KAB30AA053/054/055/056 changed from Divisions 1 and 4 to Divisions 2 and 3. CIV 30KAB30AA056 on the common 2.B header is normally powered from Division 2. This valve has a standby emergency power supply of diesel generator (DG) 2, with DG 1 as the alternate emergency power supply. There was a typographical error when these changes were incorporated into Revision 4 of U.S. EPR FSAR Tier 1, Table 2.7.1-2. U.S. EPR FSAR Tier 1, Table 2.7.1-2 will be corrected to resolve this.

The acceptance criterion for ITAAC Item 7.3 in U.S. EPR FSAR Tier 1, Table 2.7.1-3, will be updated for consistency with Tier 2, Table 9.2.2-2.

U.S. EPR FSAR Tier 1, Section 2.7.2 and Table 2.7.2-5, will be revised to correct inconsistencies found during the NRC review of Revision 5 of the U.S. EPR FSAR. Specifically, Tier 1, Section 2.7.2, ITAAC Item 3.5 will be deleted.

The safety chilled water system (SCWS) condenser fan tag numbers in U.S. EPR FSAR Tier 1, Tables 2.7.2-3 and 2.7.2-4 will be updated to 30QKA10AN025/026/027/028 and 30QKA40AN025/026/027/028 for consistency with U.S. EPR FSAR Tier 1, Figure 2.7.2-2.

**FSAR Impact:**

U.S. EPR FSAR Tier 1, Section 2.7.2 and Tables 2.7.1-2, 2.7.1-3, 2.7.2-3, 2.7.2-4, and 2.7.2-5 will be revised as described in the response and indicated on the enclosed markup.



# U.S. EPR Final Safety Analysis Report Markups



Table 2.7.1-2—CCWS Equipment I&C and Electrical Design  
Sheet 4 of 8

Description	Tag Number <sup>(1)</sup>	Location	IEEE Class 1E <sup>(2)</sup>	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls	Failure Position
Common Header 1.b RCP Thermal Barriers Containment Isolation Valves	30KAB30AA049	Safeguard Building 1	1 <sup>N</sup> 2 <sup>A</sup>	Yes	Yes	Position / Position	Open-Close / Open-Close	As-is
	30KAB30AA050	Reactor Building	4 <sup>N</sup> 3 <sup>A</sup>					
	30KAB30AA051	Reactor Building	4 <sup>N</sup> 3 <sup>A</sup>					
	30KAB30AA052	Safeguard Building 1	1 <sup>N</sup> 2 <sup>A</sup>					
Common Header 2.b RCP Thermal Barriers Containment Isolation Valves	30KAB30AA053	Safeguard Building 4	2 <sup>N</sup> 1 <sup>A</sup>	Yes	Yes	Position / Position	Open-Close / Open-Close	As-is
	30KAB30AA054	Reactor Building	3 <sup>N</sup> 4 <sup>A</sup>					
	30KAB30AA055	Reactor Building	3 <sup>N</sup> 4 <sup>A</sup>					
	30KAB30AA056	Safeguard Building 4	2 <sup>N</sup> <span style="border: 1px solid red; padding: 2px;">21<sup>A</sup></span>					



**Table 2.7.1-3—Component Cooling Water System ITAAC**  
**Sheet 10 of 11**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
7.1	Each CCWS heat exchanger listed in Table 2.7.1-1 has the capacity to transfer the design heat load to the ESWS.	Tests and analyses will be performed to verify the capability of the CCWS heat exchangers to transfer the design heat load to the ESWS.	a. Each CCWS heat exchanger listed in Table 2.7.1-1 has the capacity to transfer a heat load of greater than or equal to $293.35 \times 10^6$ BTU/hr to the ESWS. b. Each CCWS heat exchanger listed in Table 2.7.1-1 has a heat transfer area that includes a minimum additional margin of 10% above the specified 10% tube plugging allowance.
7.2	The pumps listed in Table 2.7.1-1 have NPSHA that is greater than NPSHR at system run-out flow at the minimum surge tank level.	Tests and analyses will be performed to verify pump NPSHA is greater than NPSHR at system run-out flow at the minimum surge tank level.	The pumps listed in Table 2.7.1-1 have NPSHA that is greater than NPSHR at system run-out flow at the minimum surge tank level.
7.3	The CCWS delivers water to the LHSI/RHRS heat exchangers to provide cooling.	Tests will be performed to verify the CCWS flowrate to the LHSI/RHRS heat exchangers under normal operating conditions.	The CCWS delivers a minimum flow of $2.1906 \times 10^6$ lbm/hr to <u>each</u> LHSI/RHR <del>train 1 and 4</del> heat exchangers and <del><math>2.984 \times 10^6</math> lbm/hr to LHSI/RHR train 2 and 3</del> heat exchangers under normal operating conditions.
7.4	The CCWS delivers water to the RCP thermal barrier coolers at the required flow from Common 1.b header and also from Common 2.b header.	Tests will be performed to verify the CCWS flowrate to the thermal barrier coolers from Common 1.b header and also from Common 2.b header under normal operating conditions.	The CCWS delivers a minimum flow of $0.0792 \times 10^6$ lbm/hr to the thermal barrier coolers from Common 1.b header and also from Common 2.b header under normal operating conditions.
7.5	The CCWS delivers water to Divisions 2 and 3 SCWS chiller heat exchangers.	Tests will be performed to verify the CCWS flowrate to the Divisions 2 and 3 SCWS chiller heat exchangers under normal operating conditions.	The CCWS delivers a minimum flow of $0.514 \times 10^6$ lbm/hr to the Divisions 2 and 3 SCWS chiller heat exchangers under normal operating conditions.



3.4 Equipment identified as Seismic Category I in Tables 2.7.2-1 and 2.7.2-3 can withstand seismic design basis loads without a loss of safety function(s).

3.5 ~~Deleted. Check dampers listed in Table 2.7.2-3 will function to change position as listed in Table 2.7.2-3 under normal operating conditions.~~

3.6 Deleted.

3.7 Deleted.

3.8 Deleted.

3.9 Deleted.

3.10 Deleted.

3.11 Deleted.

3.12 Deleted.

3.13 Deleted.

3.14 ASME Code Class 3 piping systems are designed in accordance with ASME Code Section III requirements.

3.15 As-built ASME Code Class 3 components listed in Table 2.7.2-1 are reconciled with the design requirements.

3.16 Pressure-boundary welds in ASME Code Class 3 components listed in Table 2.7.2-1 meet ASME Code Section III non-destructive examination requirements.

3.17 ASME Code Class 3 components listed in Table 2.7.2-1 retain their pressure-boundary integrity at their design pressure.

3.18 ASME Code Class 3 components listed in Table 2.7.2-1 are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.

3.19 Equipment listed in Table 2.7.2-3 as ASME AG-1 Code are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.

#### **4.0 I&C Design Features, Displays, and Controls**

4.1 Displays listed in Tables 2.7.2-2 and 2.7.2-4 are indicated on the PICS operator workstations in the MCR and the RSS.

4.2 Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Tables 2.7.2-2 and 2.7.2-4.

4.3 Equipment listed as being controlled by a PACS module in Tables 2.7.2-2 and 2.7.2-4 responds to the state requested and provides drive monitoring signals back to the



Table 2.7.2-3—SCWS Air Cooled Division Equipment Mechanical Design  
Sheet 1 of 2

Description	Tag Number <sup>(1)</sup>	Location	ASME AG-1 Code	Function	Seismic Category
<b>Safety Chilled Water Air Cooled Division 1</b>					
Condenser Fan Check Dampers	30QKA10AA023	Safeguard Building 1	Yes	Open/Close	I
	30QKA10AA024				
	30QKA10AA025				
	30QKA10AA026				
	30QKA10AA033				
	30QKA10AA034				
	30QKA10AA035				
	30QKA10AA036				
Condenser Fans	30QKA10AN021	Safeguard Building 1	Yes	Run	I
	30QKA10AN022				
	30QKA10AN023				
	30QKA10AN024				
	30QKA10AN025				
	30QKA10AN026				
	30QKA10AN027				
	30QKA10AN028				
<b>Safety Chilled Water Air Cooled Division 4</b>					
Condenser Fan Check Dampers	30QKA40AA023	Safeguard Building 4	Yes	Open/Close	I
	30QKA40AA024				
	30QKA40AA025				
	30QKA40AA026				
	30QKA40AA033				
	30QKA40AA034				
	30QKA40AA035				
	30QKA40AA036				



Table 2.7.2-3—SCWS Air Cooled Division Equipment Mechanical Design  
Sheet 2 of 2

Description	Tag Number <sup>(1)</sup>	Location	ASME AG-1 Code	Function	Seismic Category
Condenser Fans	30QKA40AN021	Safeguard Building 4	Yes	Run	I
	30QKA40AN022				
	30QKA40AN023				
	30QKA40AN024				
	30QKA40AN025				
	30QKA40AN026				
	30QKA40AN027				
	30QKA40AN028				

1. Equipment tag numbers are provided for information only and are not part of the certified design.

Table 2.7.2-4—SCWS Air Cooled Division Equipment I&C and Electrical Design

Description	Tag Number <sup>(1)</sup>	Location	IEEE Class 1E <sup>(2)</sup>	EQ – Harsh Env.	PACS
<b>Safety Chilled Water Air Cooled Division 1</b>					
Condenser Fans	30QKA10AN021	Safeguard Building 1	Division 1 <sup>N</sup> Division 4 <sup>A</sup>	No	Yes
	30QKA10AN022				
	30QKA10AN023				
	30QKA10AN024				
	30QKA10AN02 <del>35</del>				
	30QKA10AN02 <del>36</del>				
	30QKA10AN02 <del>37</del>				
	30QKA10AN02 <del>38</del>				
Supply Air Heater	30QKA10AH021	Safeguard Building 1	Division 1 <sup>N</sup> Division 4 <sup>A</sup>	No	Yes
<b>Safety Chilled Water Air Cooled Division 4</b>					
Condenser Fans	30QKA40AN021	Safeguard Building 4	Division 4 <sup>N</sup> Division 1 <sup>A</sup>	No	Yes
	30QKA40AN022				
	30QKA40AN023				
	30QKA40AN024				
	30QKA40AN02 <del>35</del>				
	30QKA40AN02 <del>36</del>				
	30QKA40AN02 <del>37</del>				
	30QKA40AN02 <del>38</del>				
Supply Air Heater	30QKA40AH021	Safeguard Building 4	Division 4 <sup>N</sup> Division 1 <sup>A</sup>	No	Yes

1. Equipment tag numbers are provided for information only and are not part of the certified design.

2. <sup>N</sup> denotes the division the equipment is normally powered from; <sup>A</sup> denotes the division the equipment is powered from when alternate feed is implemented.



**Table 2.7.2-5—Safety Chilled Water System ITAAC**  
**Sheet 2 of 7**

	<b>Commitment Wording</b>	<b>Inspections, Tests, Analyses</b>	<b>Acceptance Criteria</b>
3.4	Equipment identified as Seismic Category I in Tables 2.7.2-1 and 2.7.2-3 can withstand seismic design basis loads without a loss of safety function(s).	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment identified as Seismic Category I in Tables 2.7.2-1 and 2.7.2-3 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements.  b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Tables 2.7.2-1 and 2.7.2-3 to verify that the equipment, including anchorage, are installed in a condition bounded by the tested or analyzed condition.	a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Tables 2.7.2-1 and 2.7.2-3 can withstand seismic design basis loads without a loss of safety function(s).  b. Inspection reports conclude that the equipment identified as Seismic Category I in Tables 2.7.2-1 and 2.7.2-3, including anchorage, are installed in a condition bounded by the tested or analyzed condition.
3.5	<del>Equipment listed in Table 2.7.2-3 as ASME AG-1 Code are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.-</del>	<del>An inspection of the as-built construction activities and documentation for ASME AG-1 Code equipment will be conducted.</del>	<del>A report concludes that ASME AG-1 Code equipment listed in Table 2.7.2-3 are fabricated, installed, inspected, and tested in accordance with ASME AG-1 Code requirements.</del>
3.6	Deleted.	Deleted.	Deleted.
3.7	Deleted.	Deleted.	Deleted.
3.8	Deleted.	Deleted.	Deleted.
3.9	Deleted.	Deleted.	Deleted.
3.10	Deleted.	Deleted.	Deleted.
3.11	Deleted.	Deleted.	Deleted.
3.12	Deleted.	Deleted.	Deleted.
3.13	Deleted.	Deleted.	Deleted.