

## ArevaEPRDCPEm Resource

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**From:** McLellan, Judith  
**Sent:** Friday, September 07, 2012 2:52 PM  
**To:** ArevaEPRDCPEm Resource  
**Subject:** FW: Response to U.S. EPR Design Certification Application RAI No. 361, FSARCh. 9, Supplement 6  
**Attachments:** RAI 361 Supplement 6 Response US EPR DC.pdf

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**From:** BRYAN Martin (EXTERNAL AREVA) [mailto:Martin.Bryan.ext@areva.com]  
**Sent:** Wednesday, October 27, 2010 10:33 AM  
**To:** Tesfaye, Getachew  
**Cc:** DELANO Karen (AREVA); ROMINE Judy (AREVA); BENNETT Kathy (AREVA); KOWALSKI David (AREVA)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 361, FSARCh. 9, Supplement 6

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eleven questions in RAI No. 361 on April 2, 2010. Supplement 1 and Supplement 2 responses to RAI No. 361 were sent on July 1, 2010 and August 31, 2010, respectively, to provide a revised schedule. Supplement 3 response to RAI No. 361 was sent on September 14, 2010 to provide technically correct and complete responses to seven of the eleven questions. Supplement 4 response to RAI No. 361 was sent on September 30, 2010 to provide a revised schedule. Supplement 5 response to RAI No. 361 was sent on October 15, 2010 to provide technically correct and complete responses to three of the four questions.

The attached file, "RAI 361 Supplement 6 Response US EPR DC.pdf" provides a technically correct and complete response to the remaining question.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the response to RAI 361 Question 09.02.02-95.

The following table indicates the respective pages in the response document, "RAI 361 Supplement 6 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 361 — 09.02.02-95	2	3

This concludes the formal AREVA NP response to RAI 361, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Martin (Marty) C. Bryan  
U.S. EPR Design Certification Licensing Manager  
AREVA NP Inc.  
Tel: (434) 832-3016  
702 561-3528 cell  
[Martin.Bryan.ext@areva.com](mailto:Martin.Bryan.ext@areva.com)

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**From:** BRYAN Martin (External RS/NB)  
**Sent:** Friday, October 15, 2010 2:39 PM

**To:** 'Tesfaye, Getachew'

**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); KOWALSKI David (RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 361, FSARCh. 9, Supplement 5

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eleven questions in RAI No. 361 on April 2, 2010. Supplement 1 and Supplement 2 responses to RAI No. 361 were sent on July 1, 2010 and August 31, 2010, respectively, to provide a revised schedule. Supplement 3 response to RAI No. 361 was sent on September 14, 2010 to provide technically correct and complete responses to seven of the eleven questions. Supplement 4 response to RAI No. 361 was sent on September 30, 2010 to provide a revised schedule.

The attached file, "RAI 361 Supplement 5 Response US EPR DC.pdf" provides technically correct and complete responses to three of the four remaining questions.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the responses to RAI 361 Questions 09.02.02-97, 09.02.02-101 and 09.02.02-103.

The following table indicates the respective pages in the response document, "RAI 361 Supplement 5 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

<b>Question #</b>	<b>Start Page</b>	<b>End Page</b>
RAI 361 — 09.02.02-97	2	2
RAI 361 — 09.02.02-101	3	6
RAI 361 — 09.02.02-103	7	7

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

<b>Question #</b>	<b>Response Date</b>
RAI 361 — 09.02.02-95	October 27, 2010

Sincerely,

Martin (Marty) C. Bryan  
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---

**From:** BRYAN Martin (External RS/NB)

**Sent:** Thursday, September 30, 2010 8:40 AM

**To:** 'Tesfaye, Getachew'

**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); KOWALSKI David (RS/NB); RYAN Tom (RS/NB)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 361, FSARCh. 9, Supplement 4

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eleven questions in RAI No. 361 on April 2, 2010. Supplement 1 and Supplement 2 responses to RAI No. 361 were sent on July 1, 2010 and August 31, 2010, respectively, to provide a revised schedule. Supplement 3 response to RAI No. 361 was sent on September 14, 2010 to provide a technically correct and complete response to seven of the questions, and a revised schedule for the remaining 4 remaining question responses.

Since the remaining responses are being processed, a revised schedule is provided in this e-mail.

The schedule for technically correct and complete responses to the questions has been revised as provided below.

Question #	Response Date
RAI 361 — 09.02.02-95	October 27, 2010
RAI 361 — 09.02.02-97	October 15, 2010
RAI 361 — 09.02.02-101	October 15, 2010
RAI 361 — 09.02.02-103	October 15, 2010

Sincerely,

Martin (Marty) C. Bryan  
 U.S. EPR Design Certification Licensing Manager  
 AREVA NP Inc.  
 Tel: (434) 832-3016  
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**From:** BRYAN Martin (External RS/NB)  
**Sent:** Tuesday, September 14, 2010 6:11 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); KOWALSKI David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 361, FSARCh. 9, Supplement 3

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eleven questions in RAI No. 361 on April 2, 2010. Supplement 1 and Supplement 2 responses to RAI No. 361 were sent on July 1, 2010 and August 31, 2010, respectively, to provide a revised schedule.

The attached file, "RAI 361 Supplement 3 Response US EPR DC.pdf" provides technically correct and complete responses to seven of the eleven questions.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the responses to RAI 361 Questions 09.02.02-94, 09.02.02-96, 09.02.02-98, 09.02.02-99, 09.02.02-100, 09.02.02-102 and 09.02.02-104.

The following table indicates the respective pages in the response document, "RAI 361 Supplement 3 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 361 — 09.02.02-94	2	2
RAI 361 — 09.02.02-96	3	3

RAI 361 — 09.02.02-98	4	5
RAI 361 — 09.02.02-99	6	7
RAI 361 — 09.02.02-100	8	8
RAI 361 — 09.02.02-102	9	9
RAI 361 — 09.02.02-104	10	10

Since the remaining responses are being processed, a revised schedule is provided in this e-mail.

The schedule for technically correct and complete responses to the questions has been revised as provided below.

Question #	Response Date
RAI 361 — 09.02.02-95	September 30, 2010
RAI 361 — 09.02.02-97	September 30, 2010
RAI 361 — 09.02.02-101	September 30, 2010
RAI 361 — 09.02.02-103	September 30, 2010

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**From:** BRYAN Martin (External RS/NB)  
**Sent:** Tuesday, August 31, 2010 4:03 PM  
**To:** 'Tefaye, Getachew'  
**Cc:** DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); KOWALSKI David (RS/NB)  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 361, FSARCh. 9, Supplement 2

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eleven questions in RAI No. 361 on April 2, 2010. Supplement 1 of RAI No. 361 was sent on July 1, 2010 to revise the schedule. Since responses to the remaining questions are being processed, a revised schedule is provided in this email.

The schedule for technically correct and complete responses to these questions is provided below.

Question #	Response Date
RAI 361 — 09.02.02-94	September 14, 2010
RAI 361 — 09.02.02-95	September 14, 2010
RAI 361 — 09.02.02-96	September 14, 2010
RAI 361 — 09.02.02-97	September 14, 2010
RAI 361 — 09.02.02-98	September 14, 2010
RAI 361 — 09.02.02-99	September 14, 2010
RAI 361 — 09.02.02-100	September 14, 2010
RAI 361 — 09.02.02-101	September 14, 2010
RAI 361 — 09.02.02-102	September 14, 2010
RAI 361 — 09.02.02-103	September 14, 2010
RAI 361 — 09.02.02-104	September 14, 2010

Sincerely,

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---

**From:** BRYAN Martin (EXT)  
**Sent:** Thursday, July 01, 2010 4:40 PM  
**To:** 'Tesfaye, Getachew'  
**Cc:** DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); KOWALSKI David J (AREVA NP INC); 'Carneal, Jason'  
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 361, FSARCh. 9, Supplement 1

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the eleven questions in RAI No. 361 on April 2, 2010.

To allow time for interaction between AREVA and the NRC staff, a revised schedule is provided in this e-mail.

The schedule for technically correct and complete responses to the eleven questions has been revised and is provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 361 — 09.02.02-94	August 31, 2010
RAI 361 — 09.02.02-95	August 31, 2010
RAI 361 — 09.02.02-96	August 31, 2010
RAI 361 — 09.02.02-97	August 31, 2010
RAI 361 — 09.02.02-98	August 31, 2010
RAI 361 — 09.02.02-99	August 31, 2010
RAI 361 — 09.02.02-100	August 31, 2010
RAI 361 — 09.02.02-101	August 31, 2010
RAI 361 — 09.02.02-102	August 31, 2010
RAI 361 — 09.02.02-103	August 31, 2010
RAI 361 — 09.02.02-104	August 31, 2010

Sincerely,

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**From:** BRYAN Martin (EXT)

**Sent:** Friday, April 02, 2010 5:24 PM

**To:** 'Tesfaye, Getachew'

**Cc:** DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); KOWALSKI David J (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)

**Subject:** Response to U.S. EPR Design Certification Application RAI No. 361, FSARCh. 9

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 361 Response US EPR DC," provides a schedule since technically correct and complete responses to the eleven questions are not provided.

The following table indicates the respective pages in the response document, "RAI 361 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

<b>Question #</b>	<b>Start Page</b>	<b>End Page</b>
RAI 361 — 09.02.02-94	2	2
RAI 361 — 09.02.02-95	3	3
RAI 361 — 09.02.02-96	4	4
RAI 361 — 09.02.02-97	5	5
RAI 361 — 09.02.02-98	6	6
RAI 361 — 09.02.02-99	7	7
RAI 361 — 09.02.02-100	8	8
RAI 361 — 09.02.02-101	9	9
RAI 361 — 09.02.02-102	10	10
RAI 361 — 09.02.02-103	11	11
RAI 361 — 09.02.02-104	12	12

The schedule for a technically correct and complete response to these questions is provided below.

<b>Question #</b>	<b>Response Date</b>
RAI 361 — 09.02.02-94	July 1, 2010
RAI 361 — 09.02.02-95	July 1, 2010
RAI 361 — 09.02.02-96	July 1, 2010
RAI 361 — 09.02.02-97	July 1, 2010
RAI 361 — 09.02.02-98	July 1, 2010
RAI 361 — 09.02.02-99	July 1, 2010
RAI 361 — 09.02.02-100	July 1, 2010
RAI 361 — 09.02.02-101	July 1, 2010
RAI 361 — 09.02.02-102	July 1, 2010
RAI 361 — 09.02.02-103	July 1, 2010
RAI 361 — 09.02.02-104	July 1, 2010

Sincerely,

Martin (Marty) C. Bryan  
Licensing Advisory Engineer  
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Martin.Bryan.ext@areva.com

**From:** Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]

**Sent:** Thursday, March 04, 2010 2:27 PM

**To:** ZZ-DL-A-USEPR-DL

**Cc:** Eul, Ryan; Wheeler, Larry; Lee, Samuel; Segala, John; Hearn, Peter; Colaccino, Joseph; ArevaEPRDCPEm Resource

**Subject:** U.S. EPR Design Certification Application RAI No. 361 (4260), FSARCh. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on January 26, 2010, and discussed with your staff on March 4, 2010. Drat RAI Question 09.02.02-98 was modified as a result of that discussion. 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:** 4033

**Mail Envelope Properties** (A41C2340DAB39B44AD0B9623285CB3337FA7572E3E)

**Subject:** FW: Response to U.S. EPR Design Certification Application RAI No. 361,  
FSARCh. 9, Supplement 6  
**Sent Date:** 9/7/2012 2:51:45 PM  
**Received Date:** 9/7/2012 2:51:48 PM  
**From:** McLellan, Judith

**Created By:** Judith.McLellan@nrc.gov

**Recipients:**  
"ArevaEPRDCPEm Resource" <ArevaEPRDCPEm.Resource@nrc.gov>  
Tracking Status: None

**Post Office:** HQCLSTR02.nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	14186	9/7/2012 2:51:48 PM
RAI 361 Supplement 6 Response US EPR DC.pdf		981299

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



**Response to**

**Request for Additional Information No. 361, Supplement 6**

**3/04/2010**

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

**AREVA NP Inc.**

**Docket No. 52-020**

**SRP Section: 09.02.02 - Reactor Auxiliary Cooling Water Systems**

**Application Section: 09.02.08**

**QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)**

**Question 09.02.02-95:****Follow-up to RAI 174, Question 09.02.02-53**

Standard Review Plan (SRP) Section 9.2.2, which is being utilized as guidance for the review of the safety chilled water system (SCWS), specifies in Section III confirmation of the overall arrangement of the component cooling system (CCWS) in the Final Safety Analysis Report (FSAR). Based on the staff's review of the applicant's response to RAI 174, Question 9.2.2-53, Supplement 5 and information provided in the associated markup of the Final Safety Analysis Report (FSAR), Section 9.2.8, "Safety Chilled Water System" the staff found a significant design change to the system. The safety chilled water system (SCWS) design now utilizes "cross-ties" between Trains 1 and 2 and between Trains 3 and 4, instead of the independent four-train system structure utilized in the original design.

- a. The staff noted that Tier 1 Table 2.7.2-2, "Safety Chilled Water System Equipment I&C and Electrical Design," identifies normal and alternate power supplies for the motor-operated SCWS cross-tie valves, but the valve power supplies are not described anywhere in the proposed Tier 2 FSAR sections provided in the response.
- b. Provide a description of these power supplies in the Tier 2 portion of the FSAR.
- c. Update FSAR Table 3.9.6-2, "In-service Valve Testing Program Requirements" to include the motor-operated cross-tie valves.
- d. Add the SCWS flow direction arrows to the Figure 9.2.8-1 (Sheets 1 through 4), "Safety Chilled Water Diagram," to confirm the directional flows in various sections of pipe under both independent and cross-tie alignments.

**Response to Question 09.02.02-95:**

- a) U.S. EPR FSAR Tier 2, Section 9.2.8.3.2 will be revised to describe the alternate power supplies to the motor-operated valves in more detail.

The current design of the SCWS uses "cross-ties" between Trains 1 and 2, and Trains 3 and 4; the N+2 concept described in U.S. EPR FSAR Tier 2, Section 9.2.8.4 is no longer applicable and will be removed from this section.

- b) Refer to the response to Part a.
- c) U.S. EPR FSAR Tier 2, Table 3.9.6-2—Inservice Valve Testing Program Requirements will be revised to include the motor-operated cross-tie valves. Additional changes to this table will include changing several large diameter valves from plug valves to butterfly valves and adding a number of manually operated valves. Also, a check valve will be added to each SCWS train demineralized water source connection to prevent backflow and/or contamination of the demineralized water system.
- d) Refer to the Response to RAI 174, Supplement 5, Question 09.02.02-53. Flow direction arrows will be added to applicable sheets of U.S. EPR FSAR Tier 1, Figure 2.7.2-1—Safety Chilled Water System Functional Arrangement, and U.S. EPR FSAR Tier 2, Figure 9.2.8-1—Safety Chilled Water System Diagram.

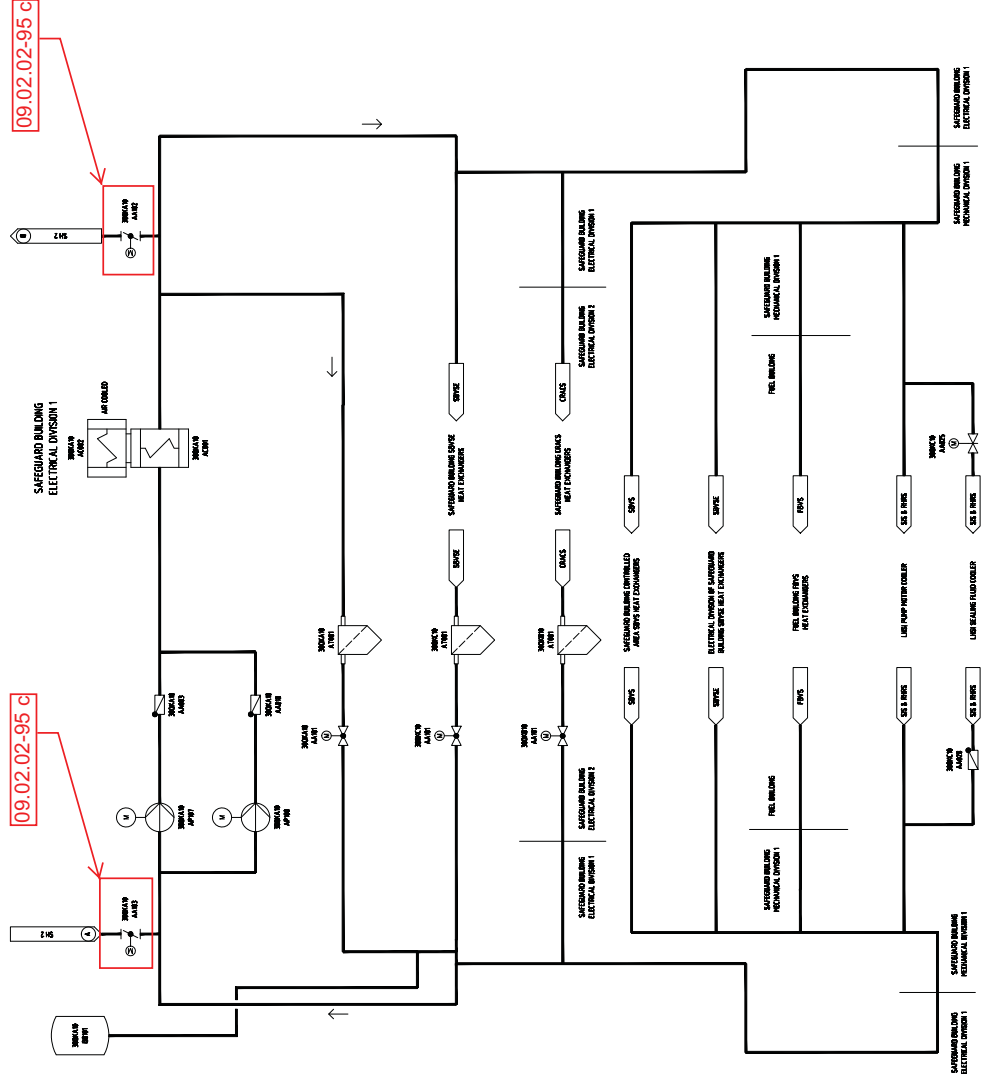
The sheet-to-sheet continuation arrows provide an indication of flow direction. On Sheets 1 through 4, the supply side is on the right and the return side is on the left. For cross-tie operation, flow can be in either direction in the cross-tie lines depending on which SCWS train is in operation. For example, if SCWS Train 1 is the operating train in divisional pair 1 & 2, starting on Sheet 1, approximately half the total flow is through Train 1 cross-tie supply valve 30QKA10AA102 (continuation to sheet 2), then through Train 2 cross-tie supply valve 30QKA20AA102 to Division 2 user heat exchangers. Similarly, on the return side, starting on Sheet 2, return flow is from the Division 2 user heat exchangers through the Train 2 cross-tie return valve 30QKA20AA103 (continuation to sheet 1), then through Train 1 cross-tie return valve 30QKA10AA103 to the suction side of the Train 1 pumps. As shown on Sheet 1, on the supply side, the other approximate half of the total flow goes to the Division 1 user heat exchangers and returns to the suction side of the Train 1 pumps.

**FSAR Impact:**

U.S. EPR FSAR Tier 1, Figure 2.7.2-1, and U.S. EPR FSAR Tier 2, Sections 9.2.8.3.2 and 9.2.8.4, Table 3.9.6-2, and Figure 9.2.8-1 will be revised as described in the response and indicated on the enclosed markup.

# U.S. EPR Final Safety Analysis Report Markups

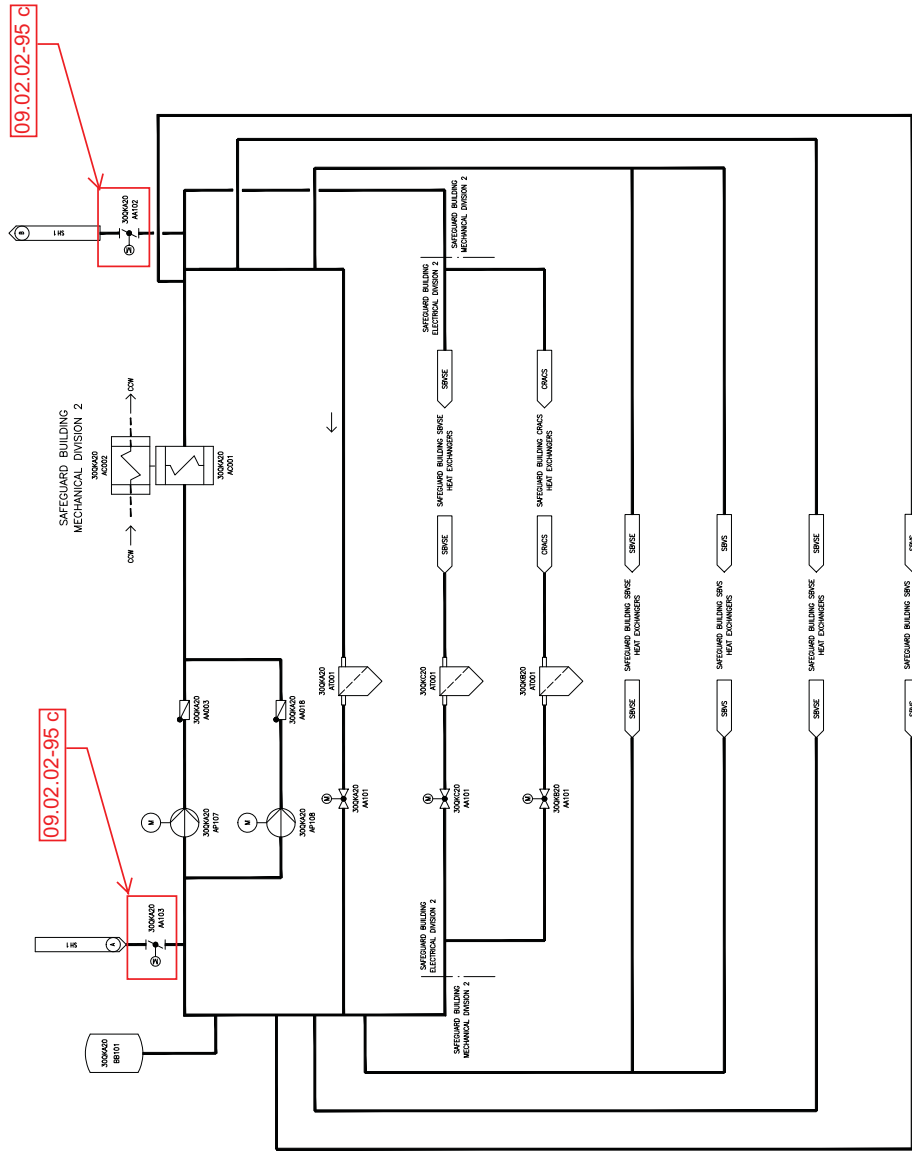
Figure 2.7.2-1—Safety Chilled Water System Functional Arrangement  
Sheet 1 of 4



REV	DATE	BY	CHK
001	08/01/01	SA	SA
002	02/02/95	SA	SA
003	02/02/95	SA	SA

REV: 003  
02/02/95

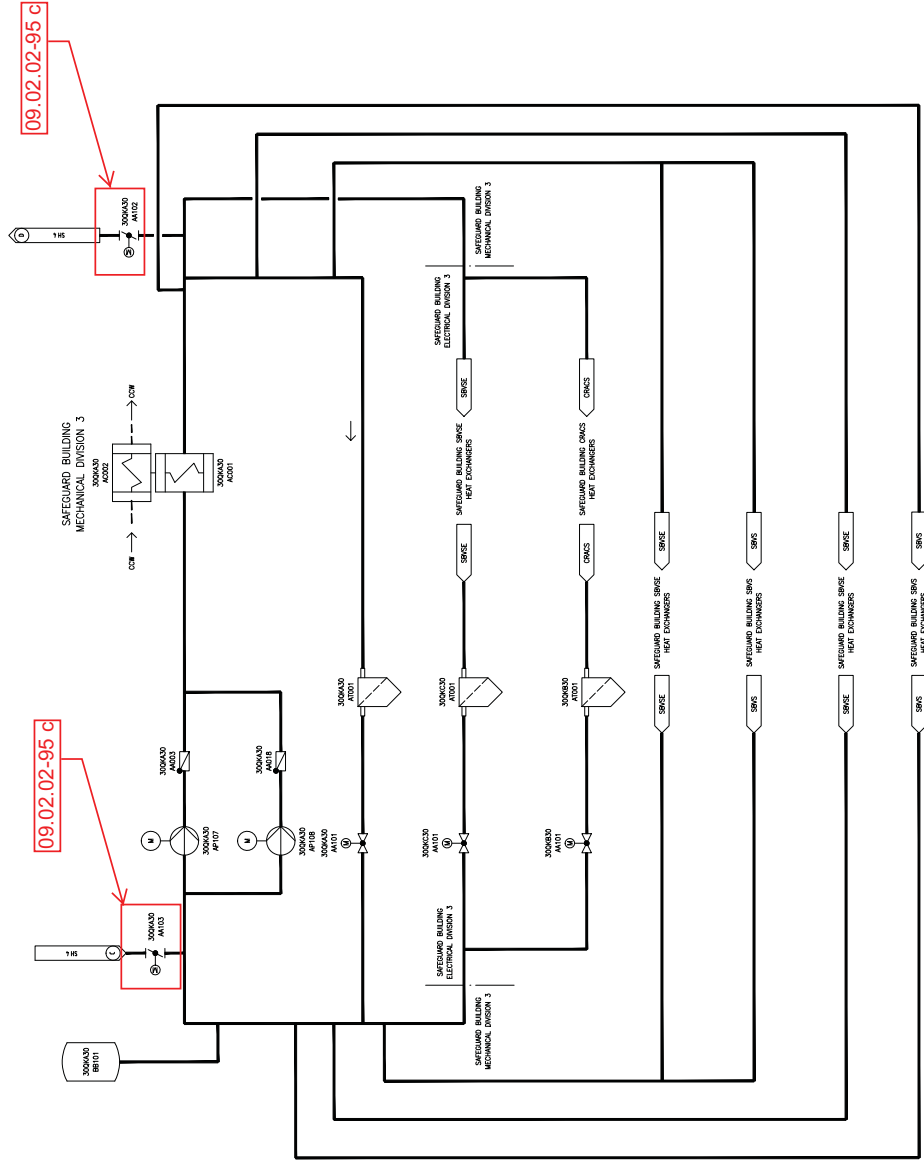
**Figure 2.7.2-1—Safety Chilled Water System Functional Arrangement**  
Sheet 2 of 4



REV	BY	DATE	DESCRIPTION
003	ASME		SSC SSIC SUPPLEMENTAL CONSTRUCTION

REV 003  
09/02/21

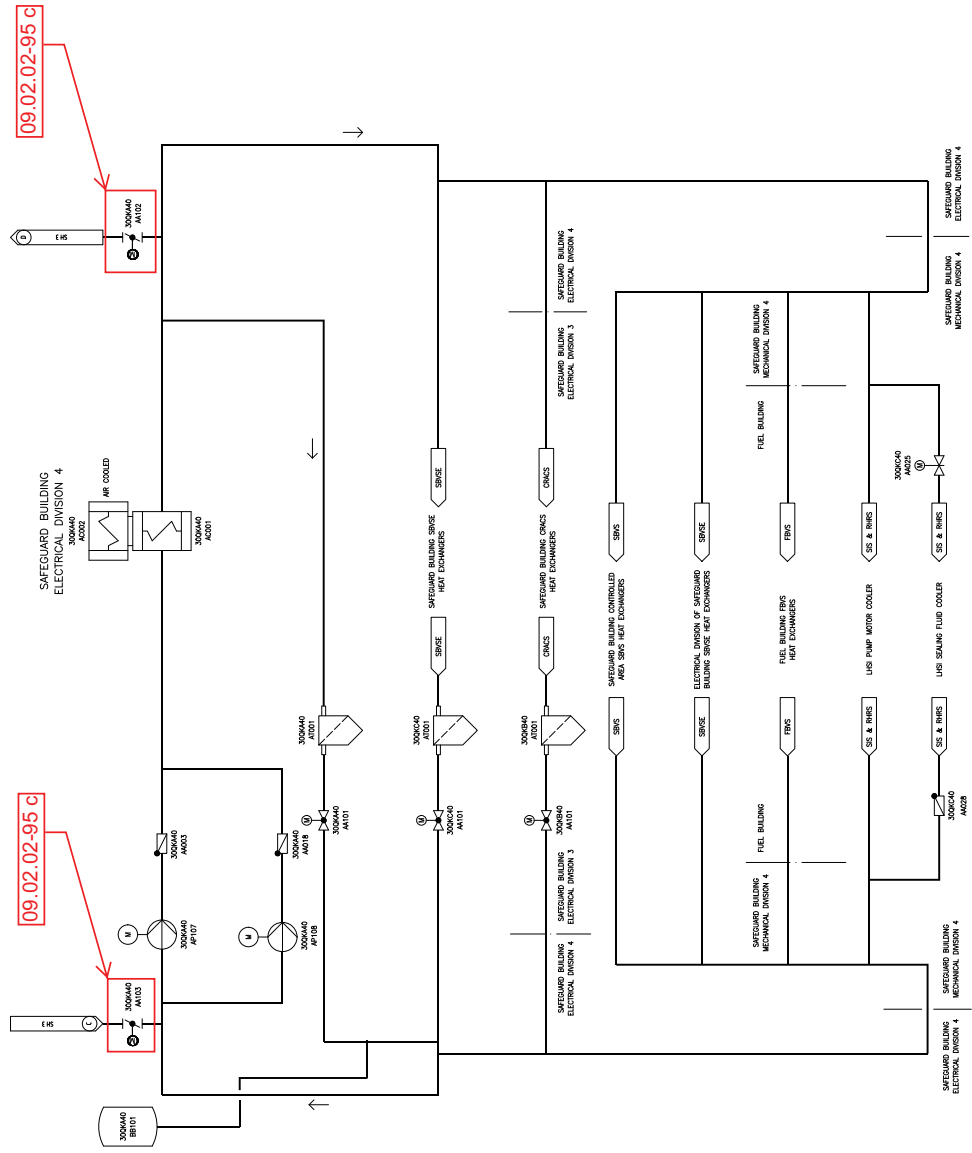
Figure 2.7.2-1—Safety Chilled Water System Functional Arrangement  
Sheet 3 of 4



I	II	L
SECTION	AREA	SSD
		SSM
		CCS

REV. 003  
09/03/11

Figure 2.7.2-1—Safety Chilled Water System Functional Arrangement  
Sheet 4 of 4



DESIGN	II	I
ASME	ASME	ASME
CLASS	CLASS	CLASS

REV003  
00A0411





Table 3.9.6-2—Inservice Valve Testing Program Requirements  
(Sheet 88 of 101)

Valve Identification Number <sup>1</sup>	Description/ Valve Function	Valve Type <sup>2</sup>	Valve Actuator <sup>3</sup>	ASME Code Class <sup>4</sup>	ASME OM Code Category <sup>5</sup>	Active / Passive <sup>6</sup>	Safety Position <sup>7</sup>	Test Required <sup>8,10</sup>	Test Frequency <sup>9</sup>	Comments
30QKA40AA101	QK Bypass Control Valve-MOV, Train 4	GB	MO	3	B	A	O/C	ET PI	Q 2Y	
30QKA40AA191	QK System Pressure Relief Valve, Train 4	RV	SA	3	C	A	O/C	ET LT PI	10Y 10Y 2Y	
30QKA10AA002	Pump Isolation Valve, Train 1	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA10AA004	Pump Isolation Valve, Train 1	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA10AA006	Pump Isolation Valve, Train 1	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA10AA017	Pump Isolation Valve, Train 1	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA10AA019	Pump Isolation Valve, Train 1	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA20AA002	Pump Isolation Valve, Train 2	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA20AA004	Pump Isolation Valve, Train 2	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA20AA006	Pump Isolation Valve, Train 2	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA20AA017	Pump Isolation Valve, Train 2	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	

09.02.02-95

Table 3.9.6-2—Inservice Valve Testing Program Requirements  
(Sheet 89 of 101)

Valve Identification Number <sup>1</sup>	Description/ Valve Function	Valve Type <sup>2</sup>	Valve Actuator <sup>3</sup>	ASME Code Class <sup>4</sup>	ASME OM Code Category <sup>5</sup>	Active / Passive <sup>6</sup>	Safety Position <sup>7</sup>	Test Required <sup>8,10</sup>	Test Frequency <sup>9</sup>	Comments
30QKA20AA019	Pump Isolation Valve, Train 2	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA30AA002	Pump Isolation Valve, Train 3	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA30AA004	Pump Isolation Valve, Train 3	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA30AA006	Pump Isolation Valve, Train 3	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA30AA017	Pump Isolation Valve, Train 3	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA30AA019	Pump Isolation Valve, Train 3	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA40AA002	Pump Isolation Valve, Train 4	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA40AA004	Pump Isolation Valve, Train 4	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA40AA006	Pump Isolation Valve, Train 4	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA40AA017	Pump Isolation Valve, Train 4	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKA40AA019	Pump Isolation Valve, Train 4	<del>PL</del> BF	MA	3	B	P	O/C	ET	5Y	
30QKB10AA001	30SAB10AC001 Isolation Valve, Train 1	PL	MA	3	B	P	O/C	ET	5Y	



09.02.02-95



Table 3.9.6-2—Inservice Valve Testing Program Requirements  
(Sheet 90 of 101)

Valve Identification Number <sup>1</sup>	Description/ Valve Function	Valve Type <sup>2</sup>	Valve Actuator <sup>3</sup>	ASME Code Class <sup>4</sup>	ASME OM Code Category <sup>5</sup>	Active / Passive <sup>6</sup>	Safety Position <sup>7</sup>	Test Required <sup>8,10</sup>	Test Frequency <sup>9</sup>	Comments
30QKB10AA004	30SAB10AC001 Isolation Valve, Train 1	PL	MA	3	B	P	O/C	ET	5Y	
30QKB20AA001	30SAB20AC001 Isolation Valve, Train 2	PL	MA	3	B	P	O/C	ET	5Y	
30QKB20AA004	30SAB20AC001 Isolation Valve, Train 2	PL	MA	3	B	P	O/C	ET	5Y	
30QKB30AA001	30SAB30AC001 Isolation Valve, Train 3	PL	MA	3	B	P	O/C	ET	5Y	
30QKB30AA004	30SAB30AC001 Isolation Valve, Train 3	PL	MA	3	B	P	O/C	ET	5Y	
<u>30QKA10AA016</u>	<u>Demin Water Check Valve</u>	<u>CK</u>	<u>SA</u>	<u>3</u>	<u>C</u>	<u>A</u>	<u>O/C</u>	<u>ET</u>	<u>Q</u>	-
<u>30QKA20AA016</u>	<u>Demin Water Check Valve</u>	<u>CK</u>	<u>SA</u>	<u>3</u>	<u>C</u>	<u>A</u>	<u>O/C</u>	<u>ET</u>	<u>Q</u>	-
<u>30QKA30AA016</u>	<u>Demin Water Check Valve</u>	<u>CK</u>	<u>SA</u>	<u>3</u>	<u>C</u>	<u>A</u>	<u>O/C</u>	<u>ET</u>	<u>Q</u>	-
<u>30QKA40AA016</u>	<u>Demin Water Check Valve</u>	<u>CK</u>	<u>SA</u>	<u>3</u>	<u>C</u>	<u>A</u>	<u>O/C</u>	<u>ET</u>	<u>Q</u>	-
<u>30QKA10AA020</u>	<u>Pump and Chiller Isolation Valve, Div. 1</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-

09.02.02-95

Table 3.9.6-2—Inservice Valve Testing Program Requirements  
(Sheet 91 of 101)

Valve Identification Number <sup>1</sup>	Description/ Valve Function	Valve Type <sup>2</sup>	Valve Actuator <sup>3</sup>	ASME Code Class <sup>4</sup>	ASME OM Code Category <sup>5</sup>	Active / Passive <sup>6</sup>	Safety Position <sup>7</sup>	Test Required <sup>8,10</sup>	Test Frequency <sup>9</sup>	Comments
<u>30QKA10AA021</u>	<u>Pump and Chiller Isolation Valve, Div. 1</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA10AA022</u>	<u>Pump and Chiller Isolation Valve, Div. 1</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA20AA020</u>	<u>Pump and Chiller Isolation Valve, Div. 2</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA20AA021</u>	<u>Pump and Chiller Isolation Valve, Div. 2</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA20AA022</u>	<u>Pump and Chiller Isolation Valve, Div. 2</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA30AA020</u>	<u>Pump and Chiller Isolation Valve, Div. 3</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA30AA021</u>	<u>Pump and Chiller Isolation Valve, Div. 3</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA30AA022</u>	<u>Pump and Chiller Isolation Valve, Div. 3</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA40AA020</u>	<u>Pump and Chiller Isolation Valve, Div. 4</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-



Table 3.9.6-2—Inservice Valve Testing Program Requirements  
(Sheet 92 of 101)

Valve Identification Number <sup>1</sup>	Description/ Valve Function	Valve Type <sup>2</sup>	Valve Actuator <sup>3</sup>	ASME Code Class <sup>4</sup>	ASME OM Code Category <sup>5</sup>	Active / Passive <sup>6</sup>	Safety Position <sup>7</sup>	Test Required <sup>8,10</sup>	Test Frequency <sup>9</sup>	Comments
<u>30QKA40AA021</u>	<u>Pump and Chiller Isolation Valve, Div. 4</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA40AA022</u>	<u>Pump and Chiller Isolation Valve, Div. 4</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA10AA028</u>	<u>Cross-tie Manual Isolation Valve, Div. 1</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA10AA029</u>	<u>Cross-tie Manual Isolation Valve, Div. 1</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA20AA028</u>	<u>Cross-tie Manual Isolation Valve, Div. 2</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA20AA029</u>	<u>Cross-tie Manual Isolation Valve, Div. 2</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA30AA028</u>	<u>Cross-tie Manual Isolation Valve, Div. 3</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA30AA029</u>	<u>Cross-tie Manual Isolation Valve, Div. 3</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA40AA028</u>	<u>Cross-tie Manual Isolation Valve, Div. 4</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-



Table 3.9.6-2—Inservice Valve Testing Program Requirements  
(Sheet 93 of 101)

Valve Identification Number <sup>1</sup>	Description/ Valve Function	Valve Type <sup>2</sup>	Valve Actuator <sup>3</sup>	ASME Code Class <sup>4</sup>	ASME OM Code Category <sup>5</sup>	Active / Passive <sup>6</sup>	Safety Position <sup>7</sup>	Test Required <sup>8,10</sup>	Test Frequency <sup>9</sup>	Comments
<u>30QKA40AA029</u>	<u>Gross-tie Manual Isolation Valve, Div. 4</u>	<u>BF</u>	<u>MA</u>	<u>3</u>	<u>B</u>	<u>P</u>	<u>O/C</u>	<u>ET</u>	<u>5Y</u>	-
<u>30QKA10AA102</u>	<u>Gross-tie Supply Valve, Div. 1</u>	<u>BF</u>	<u>MO</u>	<u>3</u>	<u>A</u>	<u>A</u>	<u>O/C</u>	<u>LT</u> <u>PI</u> <u>ST</u>	<u>2Y</u> <u>2Y</u> <u>Q</u>	-
<u>30QKA10AA103</u>	<u>Gross-tie Return Valve, Div. 1</u>	<u>BF</u>	<u>MO</u>	<u>3</u>	<u>A</u>	<u>A</u>	<u>O/C</u>	<u>LT</u> <u>PI</u> <u>ST</u>	<u>2Y</u> <u>2Y</u> <u>Q</u>	-
<u>30QKA20AA102</u>	<u>Gross-tie Supply Valve, Div. 2</u>	<u>BF</u>	<u>MO</u>	<u>3</u>	<u>A</u>	<u>A</u>	<u>O/C</u>	<u>LT</u> <u>PI</u> <u>ST</u>	<u>2Y</u> <u>2Y</u> <u>Q</u>	-
<u>30QKA20AA103</u>	<u>Gross-tie Return Valve, Div. 2</u>	<u>BF</u>	<u>MO</u>	<u>3</u>	<u>A</u>	<u>A</u>	<u>O/C</u>	<u>LT</u> <u>PI</u> <u>ST</u>	<u>2Y</u> <u>2Y</u> <u>Q</u>	-
<u>30QKA30AA102</u>	<u>Gross-tie Supply Valve, Div. 3</u>	<u>BF</u>	<u>MO</u>	<u>3</u>	<u>A</u>	<u>A</u>	<u>O/C</u>	<u>LT</u> <u>PI</u> <u>ST</u>	<u>2Y</u> <u>2Y</u> <u>Q</u>	-
<u>30QKA30AA103</u>	<u>Gross-tie Return Valve, Div. 3</u>	<u>BF</u>	<u>MO</u>	<u>3</u>	<u>A</u>	<u>A</u>	<u>O/C</u>	<u>LT</u> <u>PI</u> <u>ST</u>	<u>2Y</u> <u>2Y</u> <u>Q</u>	-
<u>30QKA40AA102</u>	<u>Gross-tie Supply Valve, Div. 4</u>	<u>BF</u>	<u>MO</u>	<u>3</u>	<u>A</u>	<u>A</u>	<u>O/C</u>	<u>LT</u> <u>PI</u> <u>ST</u>	<u>2Y</u> <u>2Y</u> <u>Q</u>	-
<u>30QKA40AA103</u>	<u>Gross-tie Return Valve, Div. 4</u>	<u>BF</u>	<u>MO</u>	<u>3</u>	<u>A</u>	<u>A</u>	<u>O/C</u>	<u>LT</u> <u>PI</u> <u>ST</u>	<u>2Y</u> <u>2Y</u> <u>Q</u>	-



~~with the SCWS expansion tank capacity to accommodate expected out leakage from the system for seven days.~~

A mechanical or electrical failure of the running SCWS pump results in a transfer to the standby pump.

Each refrigeration chiller in the four trains of the SCWS has three 50 percent capacity compressors to provide sufficient operating redundancy and flexibility in the event of a compressor failure. The two remaining chiller compressors provide 100 percent capacity as described in Section 9.2.8.2.1.

In case of loss of off-site power, each SCWS division is powered from its associated emergency diesel generator (EDG). To allow divisional maintenance (e.g., maintenance on EDGs), the SCWS safety-related motor operated flow control valves and the motor operated cross-tie valves are powered from the normal 1E power division or alternately fed from the adjacent class 1E power division. In cross-tie operation, this provides the capability to operate the SCWS flow control valves in two cross-tied trains, if necessary switch to the standby train in the divisional pair, or if necessary close the cross-tie valves. Division 2 is the alternate feed for Division 1 and vice versa. Division 4 is the alternate feed for Division 3 and vice versa.

~~To allow divisional maintenance (e.g., maintenance on emergency diesel generators), the required SCWS safety related components are alternately fed from the adjacent division to provide adequate cooling of certain safety related components during a design basis event.~~

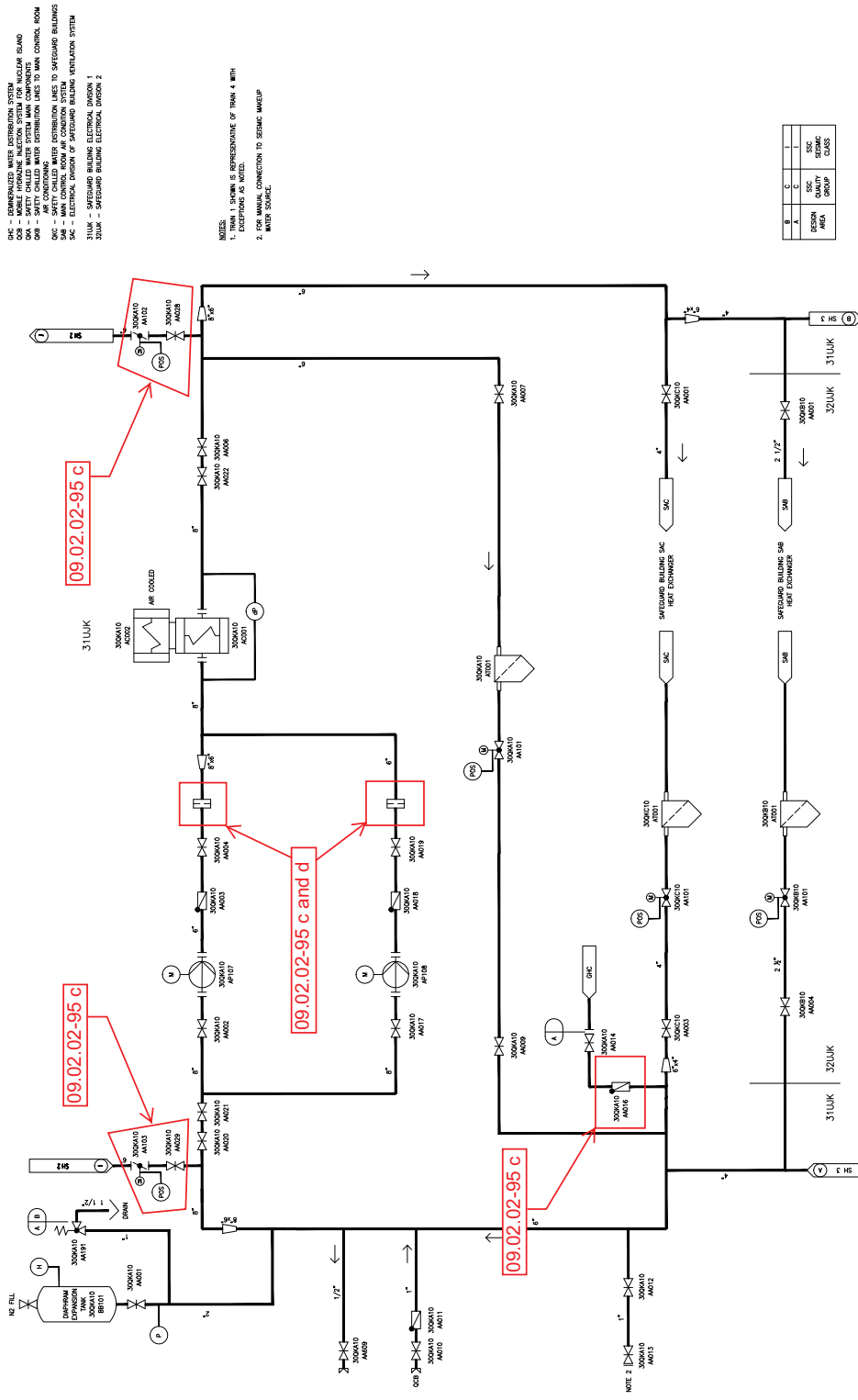
9.2.8.4

**Safety Evaluation**

- The SCWS is designed as Seismic Category I as described in Section 3.2 to operate in all plant modes of operation including design basis events. The SCWS divisions are located in SBs 1 to 4, respectively. The SBs are designed to withstand the effects of earthquakes, tornadoes, hurricanes, floods, external missiles, and other natural phenomena. Section 3.3, Section 3.4, Section 3.5, Section 3.7, and Section 3.8 provide the bases for the adequacy of the structural design of these buildings.
- The SCWS is designed to remain functional after a safe shutdown earthquake. Section 3.7 provides the design loading conditions that were considered. Section 3.5, Section 3.6, and Section 9.5.1 provide the hazards analyses to make sure that a safe shutdown, as outlined in Section 7.4, can be achieved and maintained.
- A four train design with interconnection of Train 1 and Train 2, ~~or~~ and interconnection of Train 3 and Train 4 of the SCWS fulfills the single failure criteria. ~~The four trains of safety related systems are consistent with an N+2 safety concept.~~ The four SCWS trains are backed up by the EDGs. Two of these trains, in Divisions 1 and 4, are also backed up by the SBO diesels.

09.02.02-95, Parts a and b

Figure 9.2.8-1—Safety Chilled Water System Diagram  
Sheet 1 of 4



095 - DOWNGRADED WATER DISTRIBUTION SYSTEM  
096 - SAFETY CHILLED WATER SYSTEM MAIN COMPONENTS  
097 - SAFETY CHILLED WATER DISTRIBUTION LINES TO MAIN CONTROL ROOM  
098 - SAFETY CHILLED WATER DISTRIBUTION LINES TO SAFEGUARD BUILDINGS  
099 - SAFETY CHILLED WATER DISTRIBUTION LINES TO SAFEGUARD BUILDINGS  
100 - SAFETY CHILLED WATER DISTRIBUTION LINES TO SAFEGUARD BUILDINGS  
31LUK - SAFEGUARD BUILDING ELECTRICAL DIVISION 1  
32LUK - SAFEGUARD BUILDING ELECTRICAL DIVISION 2

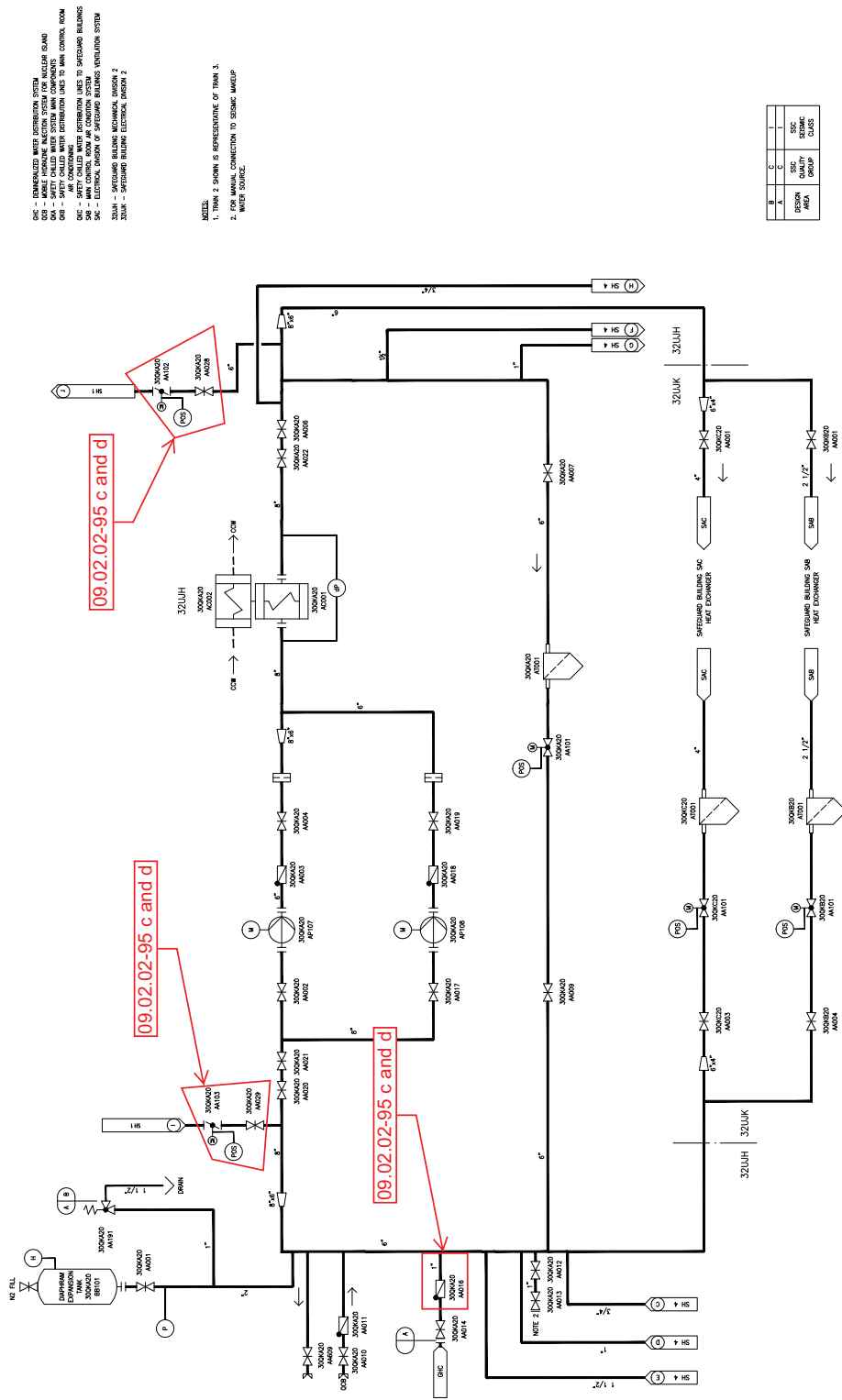
NOTES:  
1. TRAIN 1 SHOWN IS REPRESENTATIVE OF TRAIN 4 WITH EXCEPTIONS AS NOTED.  
2. FOR MANUAL CONNECTION TO SIS&C IMAGE/P  
SHUT POINTS.

REV	DESCRIPTION	DATE
A	ISSUED	09/20/03
B	ISSUED	09/20/03
C	ISSUED	09/20/03
D	ISSUED	09/20/03

REV. 003  
09/20/03



Figure 9.2.8-2—Safety Chilled Water System Diagram  
Sheet 2 of 4



REV. 003  
09A0272