ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Wednesday, May 30, 2012 5:31 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 22
Attachments: RAI 505 Supplement 22 Response US EPR DC - INTERIM.pdf

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided Supplement 10 to revise the schedule for 20 questions. On February 21, 2012, AREVA NP provided Supplement 11 to revise the schedule for Question 07.01-33. On March 16, 2012, AREVA NP provided Supplement 12 to provide a complete and final response to 2 of the remaining questions (07.01-41 and 07.05-10), and a revised response to 2 questions (07.08-46 and 07.09-72). On April 3, 2012, AREVA NP provided Supplement 13 to provide a complete and final response to one of the remaining questions (07.08-47). On April 11, 2012, AREVA NP provided Supplement 14 to provide a complete and final response to one of the remaining questions (07.01-38). On April 17, 2012, AREVA NP provided Supplement 15 to provide a complete and final response to 2 of the remaining questions (07.01-37 and 07.03-38). On April 18, 2012, AREVA NP provided Supplement 16 to provide a correct and complete final response to one of the remaining questions (07.01-50) and a revised final response to another question (07.09-72) based on NRC staff comments. On April 19, 2012, AREVA NP provided Supplement 17 to provide a correct and complete final response to one of the remaining questions (07.01-45). On April 27, 2012, AREVA NP provided Supplement 18 to provide a correct and complete final response to three of the remaining questions. On May 9, 2012, AREVA NP provided Supplement 19 to provide a correct and complete final response to three of the remaining questions. On May 22, 2012, AREVA NP provided Supplement 20 to provide a correct and complete final response to four of the remaining questions. On May 29, 2012, AREVA NP provided Supplement 21 to provide a correct and complete final response to one of the remaining questions.

The attached file, "RAI 505 Supplement 22 Response US EPR DC - INTERIM.pdf," provides an interim response to one of the remaining two questions (07.01-35). Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to this question. Note that the details of the U. S. EPR FSAR Section 7.6 mark-ups and associated figures will be provided in the final response to Question 07.01-35.

The following table indicates the respective pages in the response document, “RAI 505 Supplement 22 Response US EPR DC - INTERIM.pdf,” that contain AREVA NP’s response to the subject question.

Question #	Start Page	End Page
RAI 505 — 07.01-35	2	3

The schedule for a technically correct and complete final response to Question 07.01-35 has been changed as provided below. The schedule for a response to the other question (07.01-33) is unchanged.

Question #	Interim Response Date	Response Date
RAI 505 — 07.01-33	N/A	July 30, 2013
RAI 505 — 07.01-35	**May 30, 2012 (Actual)**	**August 15 , 2012**

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Tuesday, May 29, 2012 11:23 AM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 21

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided Supplement 10 to revise the schedule for 20 questions. On February 21, 2012, AREVA NP provided Supplement 11 to revise the schedule for Question 07.01-33. On March 16, 2012, AREVA NP provided Supplement 12 to provide a complete and final response to 2 of the remaining questions (07.01-41 and 07.05-

10), and a revised response to 2 questions (07.08-46 and 07.09-72). On April 3, 2012, AREVA NP provided Supplement 13 to provide a complete and final response to one of the remaining questions (07.08-47). On April 11, 2012, AREVA NP provided Supplement 14 to provide a complete and final response to one of the remaining questions (07.01-38). On April 17, 2012, AREVA NP provided Supplement 15 to provide a complete and final response to 2 of the remaining questions (07.01-37 and 07.03-38). On April 18, 2012, AREVA NP provided Supplement 16 to provide a correct and complete final response to one of the remaining questions (07.01-50) and a revised final response to another question (07.09-72) based on NRC staff comments. On April 19, 2012, AREVA NP provided Supplement 17 to provide a correct and complete final response to one of the remaining questions (07.01-45). On April 27, 2012, AREVA NP provided Supplement 18 to provide a correct and complete final response to three of the remaining questions. On May 9, 2012, AREVA NP provided Supplement 19 to provide a correct and complete final response to three of the remaining questions. On May 22, 2012, AREVA NP provided Supplement 20 to provide a correct and complete final response to four of the remaining questions.

The attached file, “RAI 505 Supplement 21 Response US EPR DC.pdf” provides a technically correct and complete final response to one of the remaining three questions (07.01-49). Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to this question.

The following table indicates the respective pages in the response document, “RAI 505 Supplement 21 Response US EPR DC.pdf,” that contain AREVA NP’s response to the subject question.

Question #	Start Page	End Page
RAI 505 — 07.01-49	2	3

The schedule for a technically correct and complete final response to the remaining 2 questions remains unchanged as provided below.

Question #	Response Date
RAI 505 — 07.01-33	July 30, 2013
RAI 505 — 07.01-35	May 30, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Tuesday, May 22, 2012 4:53 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)

Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 20

Getachew,

AREVA NP Inc. letter NRC:12:030 dated May 22, 2012 provides a technically correct and complete final response to 4 questions (Questions 07.01-39, 07.01-40, 07.01-47 and 07.01-51) in RAI 505.

Enclosed with the letter as a part of the response are affected pages of ANP-10315P, "U.S. EPR Protection System Surveillance Testing and TELEPERM XS Self-Monitoring Technical Report," in redline-strikeout format which support the response to RAI 505, Questions 07.01-39, 07.01-40, 07.01-47 and 07.01-51. A complete revision to the technical report will be submitted after the final submittal of all responses to RAI 505 that impact the report are completed. Since AREVA NP considers some of the material contained in the response to be proprietary, an affidavit is included with the letter, as required by 10 CFR 2.390(b), to support the withholding of the information from public disclosure. Proprietary and non-proprietary versions of the enclosure to this letter are provided separately.

The following table indicates the respective pages in the response that contain AREVA NP's final response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.01-39	2	4
RAI 505 — 07.01-40	5	6
RAI 505 — 07.01-47	7	7
RAI 505 — 07.01-51	8	16

The schedule for a technically correct and complete response to Question 07.01-33 has been changed as provided below. The response schedule for the other questions remains unchanged. This schedule was transmitted to the NRC in AREVA NP letter 12:024 dated May 10, 2012.

Question #	Response Date
RAI 505 — 07.01-33	**July 30, 2013**
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-49	May 30, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, May 09, 2012 10:02 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 19

Getachew,

AREVA NP Inc. letter NRC:12:027 dated May 9, 2012 provides a technically correct and complete final response to 3 questions (Questions 07.01-34, 07.01-44, and 07.01-48) in RAI 505.

Enclosed with the letter as a part of the response are affected pages of ANP-10315P, "U.S. EPR Protection System Surveillance Testing and TELEPERM XS Self-Monitoring Technical Report," Revision 2, in redline-strikeout format which support the response to RAI 505, Questions 07.01-34, 07.01-44, and 07.01-48. A complete revision to the technical report will be submitted after the final submittal of all responses to RAI 505 that impact the report are completed. Since AREVA NP considers some of the material contained in the response to be proprietary, an affidavit is enclosed, as required by 10 CFR 2.390(b), to support the withholding of the information from public disclosure. Proprietary and non-proprietary versions of the enclosure to this letter are provided separately.

The following table indicates the respective pages in the response that contain AREVA NP's final response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.01-34	2	4
RAI 505 — 07.01-44	5	6
RAI 505 — 07.01-48	7	10

The schedule for a technically correct and complete final response to the remaining 7 questions remains unchanged as provided below.

Question #	Response Date
RAI 505 — 07.01-33	August 30, 2013
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Friday, April 27, 2012 2:51 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 18

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided

Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided Supplement 10 to revise the schedule for 20 questions. On February 21, 2012, AREVA NP provided Supplement 11 to revise the schedule for Question 07.01-33. On March 16, 2012, AREVA NP provided Supplement 12 to provide a complete and final response to 2 of the remaining questions (07.01-41 and 07.05-10), and a revised response to 2 questions (07.08-46 and 07.09-72). On April 3, 2012, AREVA NP provided Supplement 13 to provide a complete and final response to one of the remaining questions (07.08-47). On April 11, 2012, AREVA NP provided Supplement 14 to provide a complete and final response to one of the remaining questions (07.01-38). On April 17, 2012, AREVA NP provided Supplement 15 to provide a complete and final response to 2 of the remaining questions (07.01-37 and 07.03-38). On April 18, 2012, AREVA NP provided Supplement 16 to provide a correct and complete final response to one of the remaining questions (07.01-50) and a revised final response to another question (07.09-72) based on NRC staff comments. On April 19, 2012, AREVA NP provided Supplement 17 to provide a correct and complete final response to one of the remaining questions (07.01-45).

The attached file, “RAI 505 Supplement 18 Response US EPR DC.pdf” provides a technically correct and complete final response to 3 of the remaining 13 questions (07.01-36, 07.01-46 and 07.09-71). Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to these questions.

The following table indicates the respective pages in the response document, “RAI 505 Supplement 18 Response US EPR DC.pdf,” that contain AREVA NP’s response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.01-36	2	6
RAI 505 — 07.01-46	7	8
RAI 505 — 07.09-71	9	11

The schedule for a technically correct and complete final response to the remaining 10 questions remains unchanged as provided below.

Question #	Response Date
RAI 505 — 07.01-33	August 30, 2013
RAI 505 — 07.01-34	May 9, 2012
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-44	May 9, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-48	May 9, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager

AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, April 19, 2012 11:13 AM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 17

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided Supplement 10 to revise the schedule for 20 questions. On February 21, 2012, AREVA NP provided Supplement 11 to revise the schedule for Question 07.01-33. On March 16, 2012, AREVA NP provided Supplement 12 to provide a complete and final response to 2 of the remaining questions (07.01-41 and 07.05-10), and a revised response to 2 questions (07.08-46 and 07.09-72). On April 3, 2012, AREVA NP provided Supplement 13 to provide a complete and final response to one of the remaining questions (07.08-47). On April 11, 2012, AREVA NP provided Supplement 14 to provide a complete and final response to one of the remaining questions (07.01-38). On April 17, 2012, AREVA NP provided Supplement 15 to provide a complete and final response to 2 of the remaining questions (07.01-37 and 07.03-38). On April 18, 2012, AREVA NP provided Supplement 16 to provide a correct and complete final response to one of the remaining questions (07.01-50) and a revised final response to another question (07.09-72) based on NRC staff comments.

The attached file, "RAI 505 Supplement 17 Response - US EPR DC.pdf" provides a technically correct and complete final response to 1 of the remaining 14 questions (07.01-45). Appended to this file are affected pages of the U.S. EPR Technical Report ANP-10315P in redline-strikeout format which support the response to Question 07.01-45.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 17 Response - US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 505 — 07.01-45	2	3

The schedule for a technically correct and complete final response to the remaining 13 questions remains unchanged as provided below.

Question #	Response Date
RAI 505 — 07.01-33	August 30, 2013
RAI 505 — 07.01-34	May 9, 2012
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-36	May 1, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-44	May 9, 2012
RAI 505 — 07.01-46	May 1, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-48	May 9, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012
RAI 505 — 07.09-71	May 9, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, April 18, 2012 3:06 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 16

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided

Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided Supplement 10 to revise the schedule for 20 questions. On February 21, 2012, AREVA NP provided Supplement 11 to revise the schedule for Question 07.01-33. On March 16, 2012, AREVA NP provided Supplement 12 to provide a complete and final response to 2 of the remaining questions (07.01-41 and 07.05-10), and a revised response to 2 questions (07.08-46 and 07.09-72). On April 3, 2012, AREVA NP provided Supplement 13 to provide a complete and final response to one of the remaining questions (07.08-47). On April 11, 2012, AREVA NP provided Supplement 14 to provide a complete and final response to one of the remaining questions (07.01-38). On April 17, 2012, AREVA NP provided Supplement 15 to provide a complete and final response to 2 of the remaining questions (07.01-37 and 07.03-38).

The attached file, "RAI 505 Supplement 16 Response - US EPR DC.pdf" provides a technically correct and complete final response to 1 of the remaining 15 questions (07.01-50) and a revised final response to another question (07.09-72) based on NRC staff comments. Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to Question 07.01-50 and Question 07.09-72.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 16 Response - US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.01-50	2	3
RAI 505 — 07.09-72	4	5

The schedule for a technically correct and complete final response to the remaining 14 questions remains unchanged as provided below.

Question #	Response Date
RAI 505 — 07.01-33	August 30, 2013
RAI 505 — 07.01-34	May 9, 2012
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-36	May 1, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-44	May 9, 2012
RAI 505 — 07.01-45	May 1, 2012
RAI 505 — 07.01-46	May 1, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-48	May 9, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012
RAI 505 — 07.09-71	May 9, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager

AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Tuesday, April 17, 2012 12:05 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 15

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided Supplement 10 to revise the schedule for 20 questions. On February 21, 2012, AREVA NP provided Supplement 11 to revise the schedule for Question 07.01-33. On March 16, 2012, AREVA NP provided Supplement 12 to provide a complete and final response to 2 of the remaining questions (07.01-41 and 07.05-10), and a revised response to 2 questions (07.08-46 and 07.09-72). On April 3, 2012, AREVA NP provided Supplement 13 to provide a complete and final response to one of the remaining questions (07.08-47). On April 11, 2012, AREVA NP provided Supplement 14 to provide a complete and final response to one of the remaining questions (07.01-38).

The attached file, "RAI 505 Supplement 15 Response - US EPR DC.pdf" provides a technically correct and complete final response to 2 of the remaining 17 questions (07.01-37 and 07.03-38). Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to Questions 07.01-37 and Question 07.03-38.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 15 Response - US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.01-37	2	2
RAI 505 — 07.03-38	3	35

The schedule for a technically correct and complete final response to the remaining 15 questions remains unchanged as provided below.

Question #	Response Date
RAI 505 — 07.01-33	August 30, 2013
RAI 505 — 07.01-34	May 9, 2012
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-36	May 1, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-44	May 9, 2012
RAI 505 — 07.01-45	May 1, 2012
RAI 505 — 07.01-46	May 1, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-48	May 9, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-50	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012
RAI 505 — 07.09-71	May 9, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, April 11, 2012 11:00 AM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 14

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided

Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided Supplement 10 to revise the schedule for 20 questions. On February 21, 2012, AREVA NP provided Supplement 11 to revise the schedule for Question 07.01-33. On March 16, 2012, AREVA NP provided Supplement 12 to provide a complete and final response to 2 of the remaining questions (07.01-41 and 07.05-10), and a revised response to 2 questions (07.08-46 and 07.09-72). On April 3, 2012, AREVA NP provided Supplement 13 to provide a complete and final response to one of the remaining questions (07.08-47).

The attached file, "RAI 505 Supplement 14 Response - US EPR DC.pdf" provides a technically correct and complete response to 1 of the remaining 18 questions (07.01-38). Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to Question 07.01-38.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 14 Response - US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 505 — 07.01-38	2	3

The schedule for a technically correct and complete response to the remaining 17 questions remains unchanged as provided below.

Question #	Response Date
RAI 505 — 07.01-33	August 30, 2013
RAI 505 — 07.01-34	May 9, 2012
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-36	May 1, 2012
RAI 505 — 07.01-37	April 17, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-44	May 9, 2012
RAI 505 — 07.01-45	May 1, 2012
RAI 505 — 07.01-46	May 1, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-48	May 9, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-50	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012
RAI 505 — 07.03-38	April 17, 2012
RAI 505 — 07.09-71	May 9, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B

Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Tuesday, April 03, 2012 3:27 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 13

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided Supplement 10 to revise the schedule for 20 questions. On February 21, 2012, AREVA NP provided Supplement 11 to revise the schedule for Question 07.01-33. On March 16, 2012, AREVA NP provided Supplement 12 to provide a complete and final response to 2 of the remaining questions (07.01-41 and 07.05-10), and a revised response to 2 questions (07.08-46 and 07.09-72).

The attached file, "RAI 505 Supplement 13 Response - US EPR DC.pdf" provides a technically correct and complete response to 1 of the remaining 19 questions (07.08-47). Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to Question 07.08-47. Also appended to this file are affected pages of Technical Report ANP-10315P. The revision to this technical report will be submitted by separate letter after completion of all responses to RAI 505.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 13 Response - US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 505 — 07.08-47	2	7

The schedule for a technically correct and complete response to the remaining 18 questions remains unchanged as provided below.

Question #	Response Date
RAI 505 — 07.01-33	August 30, 2013
RAI 505 — 07.01-34	May 9, 2012

RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-36	May 1, 2012
RAI 505 — 07.01-37	April 17, 2012
RAI 505 — 07.01-38	May 1, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-44	May 9, 2012
RAI 505 — 07.01-45	May 1, 2012
RAI 505 — 07.01-46	May 1, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-48	May 9, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-50	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012
RAI 505 — 07.03-38	April 17, 2012
RAI 505 — 07.09-71	May 9, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Friday, March 16, 2012 12:59 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 12

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided

Supplement 10 to revise the schedule for 20 questions. On February 21, 2012, AREVA NP provided Supplement 11 to revise the schedule for Question 07.01-33.

The attached file, “RAI 505 Supplement 12 Response - US EPR DC.pdf” provides technically correct and complete responses to 2 of the remaining 21 questions (07.01-41 and 07.05-10), and a revised response to 2 questions (07.08-46 and 07.09-72). Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the responses to Question 07.01-41, 07.05-10, 07.08-46, and 07.09-72. Also appended to this file are affected pages of Technical Reports ANP-10304, ANP-10309P and ANP-10315P. Revisions to these Technical Reports will be submitted by separate letter after completion of all responses to RAI 505.

The following table indicates the respective pages in the response document, “RAI 505 Supplement 12 Response - US EPR DC.pdf,” that contain AREVA NP’s response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.01-41	2	5
RAI 505 — 07.05-10	6	9
RAI 505 — 07.08-46	10	10
RAI 505 — 07.09-72	11	12

The schedule for a technically correct and complete response to the remaining 19 questions remains unchanged as provided below.

Question #	Response Date
RAI 505 — 07.01-33	August 30, 2013
RAI 505 — 07.01-34	May 9, 2012
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-36	May 1, 2012
RAI 505 — 07.01-37	April 17, 2012
RAI 505 — 07.01-38	May 1, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-44	May 9, 2012
RAI 505 — 07.01-45	May 1, 2012
RAI 505 — 07.01-46	May 1, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-48	May 9, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-50	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012
RAI 505 — 07.03-38	April 17, 2012
RAI 505 — 07.08-47	May 30, 2012
RAI 505 — 07.09-71	May 9, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Tuesday, February 21, 2012 9:31 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 11

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided Supplement 9 to revise the schedule for 11 questions. On February 17, 2012, AREVA NP provided Supplement 10 to revise the schedule for 20 questions.

The schedule for a technically correct and complete response to question 07.01-33 has been changed as provided below. The response schedule for the other questions remains unchanged. This schedule was transmitted to the NRC in AREVA NP letter 12:008 dated February 21, 2012.

Question #	Response Date
RAI 505 — 07.01-33	**August 30, 2013**
RAI 505 — 07.01-34	May 9, 2012
RAI 505 — 07.01-35	May 30, 2012
RAI 505 — 07.01-36	May 1, 2012
RAI 505 — 07.01-37	April 17, 2012
RAI 505 — 07.01-38	May 1, 2012
RAI 505 — 07.01-39	May 22, 2012
RAI 505 — 07.01-40	May 22, 2012
RAI 505 — 07.01-41	April 17, 2012
RAI 505 — 07.01-44	May 9, 2012
RAI 505 — 07.01-45	May 1, 2012

RAI 505 — 07.01-46	May 1, 2012
RAI 505 — 07.01-47	May 22, 2012
RAI 505 — 07.01-48	May 9, 2012
RAI 505 — 07.01-49	May 30, 2012
RAI 505 — 07.01-50	May 30, 2012
RAI 505 — 07.01-51	May 22, 2012
RAI 505 — 07.03-38	April 17, 2012
RAI 505 — 07.05-10	April 17, 2012
RAI 505 — 07.08-47	May 30, 2012
RAI 505 — 07.09-71	May 9, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Friday, February 17, 2012 4:09 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 10

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33. On February 9, 2012, AREVA NP provided Supplement 9 to revise the schedule for 11 questions.

The schedule for a technically correct and complete response to 20 of the remaining 21 questions has been changed as provided below. The response schedule to the other question remains unchanged.

Question #	Response Date

RAI 505 — 07.01-33	February 21, 2012
RAI 505 — 07.01-34	**May 9, 2012**
RAI 505 — 07.01-35	**May 30, 2012**
RAI 505 — 07.01-36	**May 1, 2012**
RAI 505 — 07.01-37	**April 17, 2012**
RAI 505 — 07.01-38	**May 1, 2012**
RAI 505 — 07.01-39	**May 22, 2012**
RAI 505 — 07.01-40	**May 22, 2012**
RAI 505 — 07.01-41	**April 17, 2012**
RAI 505 — 07.01-44	**May 9, 2012**
RAI 505 — 07.01-45	**May 1, 2012**
RAI 505 — 07.01-46	**May 1, 2012**
RAI 505 — 07.01-47	**May 22, 2012**
RAI 505 — 07.01-48	**May 9, 2012**
RAI 505 — 07.01-49	**May 30, 2012**
RAI 505 — 07.01-50	**May 30, 2012**
RAI 505 — 07.01-51	**May 22, 2012**
RAI 505 — 07.03-38	**April 17, 2012**
RAI 505 — 07.05-10	**April 17, 2012**
RAI 505 — 07.08-47	**May 30, 2012**
RAI 505 — 07.09-71	**May 9, 2012**

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, February 09, 2012 8:15 AM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 9

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided

Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions. On January 19, 2012, AREVA NP provided Supplement 8 to provide a complete and final response to one question and a revised preliminary schedule for the response to Question 07.01-33.

The schedule for a technically correct and complete response to 11 of the remaining 21 questions has been changed as provided below. The response schedule to the other 10 questions remains unchanged.

Question #	Response Date
RAI 505 — 07.01-33	February 21, 2012
RAI 505 — 07.01-34	April 5, 2012
RAI 505 — 07.01-35	April 26, 2012
RAI 505 — 07.01-36	**April 5, 2012**
RAI 505 — 07.01-37	March 8, 2012
RAI 505 — 07.01-38	**April 5, 2012**
RAI 505 — 07.01-39	**April 26, 2012**
RAI 505 — 07.01-40	**April 26, 2012**
RAI 505 — 07.01-41	**March 8, 2012**
RAI 505 — 07.01-44	**April 5, 2012**
RAI 505 — 07.01-45	April 26, 2012
RAI 505 — 07.01-46	April 26, 2012
RAI 505 — 07.01-47	**April 5, 2012**
RAI 505 — 07.01-48	**April 5, 2012**
RAI 505 — 07.01-49	**April 26, 2012**
RAI 505 — 07.01-50	April 26, 2012
RAI 505 — 07.01-51	**April 26, 2012**
RAI 505 — 07.03-38	**March 8, 2012**
RAI 505 — 07.05-10	March 8, 2012
RAI 505 — 07.08-47	April 26, 2012
RAI 505 — 07.09-71	April 5, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, January 19, 2012 11:19 AM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)

Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 8

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions. On January 10, 2012, AREVA NP provided Supplement 7 to provide a complete and final response to 2 questions.

The attached file, "RAI 505 Supplement 8 Response US EPR DC.pdf" provides a technically correct and complete final response to 1 of the remaining 22 questions.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 8 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 505 — 07.01-42	2	2

The schedule for a technically correct and complete response to the remaining 21 questions is provided below. The preliminary schedule for the response to Question 07.01-33 has been revised and is being reevaluated and a new supplement with a revised schedule will be transmitted by February 21, 2012.

Question #	Response Date
RAI 505 — 07.01-33	**February 21, 2012**
RAI 505 — 07.01-34	April 5, 2012
RAI 505 — 07.01-35	April 26, 2012
RAI 505 — 07.01-36	February 9, 2012
RAI 505 — 07.01-37	March 8, 2012
RAI 505 — 07.01-38	February 9, 2012
RAI 505 — 07.01-39	February 9, 2012
RAI 505 — 07.01-40	February 9, 2012
RAI 505 — 07.01-41	February 9, 2012
RAI 505 — 07.01-44	February 9, 2012
RAI 505 — 07.01-45	April 26, 2012
RAI 505 — 07.01-46	April 26, 2012
RAI 505 — 07.01-47	February 9, 2012
RAI 505 — 07.01-48	February 9, 2012
RAI 505 — 07.01-49	February 9, 2012
RAI 505 — 07.01-50	April 26, 2012

RAI 505 — 07.01-51	February 9, 2012
RAI 505 — 07.03-38	April 26, 2012
RAI 505 — 07.05-10	March 8, 2012
RAI 505 — 07.08-47	April 26, 2012
RAI 505 — 07.09-71	April 5, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (CORP/QP)
Sent: Tuesday, January 10, 2012 5:21 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 7

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions. On December 15, 2011, AREVA NP provided Supplement 6 to provide a complete and final response to 6 questions.

The attached file, “RAI 505 Supplement 7 Response US EPR DC.pdf” provides technically correct and complete final responses to 2 of the remaining 24 questions. Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 505 Question 07.08-48.

The following table indicates the respective pages in the response document, “RAI 505 Supplement 7 Response US EPR DC.pdf,” that contain AREVA NP’s response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.08-44	2	3
RAI 505 — 07.08-48	4	5

The schedule for a technically correct and complete response to the remaining 22 questions has changed as provided below. The preliminary schedule for the response to Question 07.01-33 is being reevaluated and a new supplement with a revised schedule will be transmitted by January 25, 2012.

Question #	Response Date
RAI 505 — 07.01-33	January 25, 2012
RAI 505 — 07.01-34	**April 5, 2012**
RAI 505 — 07.01-35	**April 26, 2012**
RAI 505 — 07.01-36	**February 9, 2012**
RAI 505 — 07.01-37	**March 8, 2012**
RAI 505 — 07.01-38	**February 9, 2012**
RAI 505 — 07.01-39	**February 9, 2012**
RAI 505 — 07.01-40	**February 9, 2012**
RAI 505 — 07.01-41	**February 9, 2012**
RAI 505 — 07.01-42	**February 9, 2012**
RAI 505 — 07.01-44	**February 9, 2012**
RAI 505 — 07.01-45	**April 26, 2012**
RAI 505 — 07.01-46	**April 26, 2012**
RAI 505 — 07.01-47	**February 9, 2012**
RAI 505 — 07.01-48	**February 9, 2012**
RAI 505 — 07.01-49	**February 9, 2012**
RAI 505 — 07.01-50	**April 26, 2012**
RAI 505 — 07.01-51	**February 9, 2012**
RAI 505 — 07.03-38	**April 26, 2012**
RAI 505 — 07.05-10	**March 8, 2012**
RAI 505 — 07.08-47	**April 26, 2012**
RAI 505 — 07.09-71	**April 5, 2012**

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, December 15, 2011 1:49 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 6

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses

to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided Supplement 4 to revise the schedule for 7 questions. On December 14, 2011, AREVA NP provided Supplement 5 to revise the schedule for 5 questions.

The attached file, "RAI 505 Supplement 6 Response US EPR DC.pdf" provides technically correct and complete responses to 6 of the remaining 30 questions. Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the responses. Also appended to this file are affected pages of Technical Reports ANP-10304 and ANP-10309P. Revisions to these Technical Reports will be submitted by separate letter after completion of all responses to RAI 505.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 6 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.03-37	2	3
RAI 505 — 07.04-15	4	5
RAI 505 — 07.05-11	6	6
RAI 505 — 07.08-43	7	8
RAI 505 — 07.08-45	9	10
RAI 505 — 07.08-49	11	12

The schedule for a technically correct and complete response to the remaining 24 questions remains unchanged. The preliminary schedule for the response to Question 07.01-33 is being reevaluated and a new supplement with a revised schedule will be transmitted by January 25, 2012.

Question #	Response Date
RAI 505 — 07.01-33	January 25, 2012
RAI 505 — 07.01-34	January 10, 2012
RAI 505 — 07.01-35	February 9, 2012
RAI 505 — 07.01-36	January 10, 2012
RAI 505 — 07.01-37	January 19, 2012
RAI 505 — 07.01-38	January 10, 2012
RAI 505 — 07.01-39	January 10, 2012
RAI 505 — 07.01-40	January 10, 2012
RAI 505 — 07.01-41	January 10, 2012
RAI 505 — 07.01-42	January 10, 2012
RAI 505 — 07.01-44	January 10, 2012
RAI 505 — 07.01-45	February 9, 2012
RAI 505 — 07.01-46	February 9, 2012
RAI 505 — 07.01-47	January 10, 2012
RAI 505 — 07.01-48	January 10, 2012
RAI 505 — 07.01-49	January 10, 2012
RAI 505 — 07.01-50	January 10, 2012
RAI 505 — 07.01-51	January 10, 2012
RAI 505 — 07.03-38	February 9, 2012

RAI 505 — 07.05-10	January 19, 2012
RAI 505 — 07.08-44	January 10, 2012
RAI 505 — 07.08-47	January 10, 2012
RAI 505 — 07.08-48	January 10, 2012
RAI 505 — 07.09-71	January 10, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, December 14, 2011 11:30 AM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 5

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. In Supplement 1 sent on October 27, 2011, and Supplement 2 sent on November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. AREVA NP provided Supplement 3 on November 22, 2011 to provide a final response to 4 questions. On December 9, 2011, AREVA NP provided a revised schedule for 7 questions.

The schedule for the response to four questions (Questions 7.1-35, 7.1-45, 7.1-46, and 7.3-38) is being changed, as indicated in bold below. In addition, the preliminary schedule for the response to Question 07.01-33 has been revised as indicated. This schedule is being reevaluated and a new supplement with a revised schedule will be transmitted by January 25, 2012. The schedule for a technically correct and complete response to the remaining 25 questions remains unchanged.

Question #	Response Date
RAI 505 — 07.01-33	**January 25, 2012**
RAI 505 — 07.01-34	January 10, 2012
RAI 505 — 07.01-35	**February 9, 2012**
RAI 505 — 07.01-36	January 10, 2012
RAI 505 — 07.01-37	January 19, 2012
RAI 505 — 07.01-38	January 10, 2012
RAI 505 — 07.01-39	January 10, 2012
RAI 505 — 07.01-40	January 10, 2012

RAI 505 — 07.01-41	January 10, 2012
RAI 505 — 07.01-42	January 10, 2012
RAI 505 — 07.01-44	January 10, 2012
RAI 505 — 07.01-45	**February 9, 2012**
RAI 505 — 07.01-46	**February 9, 2012**
RAI 505 — 07.01-47	January 10, 2012
RAI 505 — 07.01-48	January 10, 2012
RAI 505 — 07.01-49	January 10, 2012
RAI 505 — 07.01-50	January 10, 2012
RAI 505 — 07.01-51	January 10, 2012
RAI 505 — 07.03-37	January 19, 2012
RAI 505 — 07.03-38	**February 9, 2012**
RAI 505 — 07.04-15	January 19, 2012
RAI 505 — 07.05-10	January 19, 2012
RAI 505 — 07.05-11	January 19, 2012
RAI 505 — 07.08-43	January 19, 2012
RAI 505 — 07.08-44	January 10, 2012
RAI 505 — 07.08-45	January 10, 2012
RAI 505 — 07.08-47	January 10, 2012
RAI 505 — 07.08-48	January 10, 2012
RAI 505 — 07.08-49	January 19, 2012
RAI 505 — 07.09-71	January 10, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: RYAN Tom (RS/NB)
Sent: Friday, December 09, 2011 8:35 AM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB); WILLIFORD Dennis (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 4

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. On October 27, 2011, and November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33. On November 22, 2011, AREVA NP provided a final response to four questions.

The schedule for the response to the questions 7.1-37, 7.3-37, 7.4-15, 7.5-10, 7.5-11, 7.8-43, and 7.8-49 is being changed and indicated in bold below, the remaining 23 questions remains unchanged, as indicated below. In addition, the preliminary schedule for a response to Question 07.01-33 remains unchanged. The schedule for Question 07.01-33 is being reevaluated and a new supplement with a revised schedule will be transmitted by December 14, 2011.

Question #	Response Date
RAI 505 — 07.01-33	December 14, 2011
RAI 505 — 07.01-34	January 10, 2012
RAI 505 — 07.01-35	January 10, 2012
RAI 505 — 07.01-36	January 10, 2012
RAI 505 — 07.01-37	**January 19, 2012**
RAI 505 — 07.01-38	January 10, 2012
RAI 505 — 07.01-39	January 10, 2012
RAI 505 — 07.01-40	January 10, 2012
RAI 505 — 07.01-41	January 10, 2012
RAI 505 — 07.01-42	January 10, 2012
RAI 505 — 07.01-44	January 10, 2012
RAI 505 — 07.01-45	January 10, 2012
RAI 505 — 07.01-46	January 10, 2012
RAI 505 — 07.01-47	January 10, 2012
RAI 505 — 07.01-48	January 10, 2012
RAI 505 — 07.01-49	January 10, 2012
RAI 505 — 07.01-50	January 10, 2012
RAI 505 — 07.01-51	January 10, 2012
RAI 505 — 07.03-37	**January 19, 2012**
RAI 505 — 07.03-38	January 10, 2012
RAI 505 — 07.04-15	**January 19, 2012**
RAI 505 — 07.05-10	**January 19, 2012**
RAI 505 — 07.05-11	**January 19, 2012**
RAI 505 — 07.08-43	**January 19, 2012**
RAI 505 — 07.08-44	January 10, 2012
RAI 505 — 07.08-45	January 10, 2012
RAI 505 — 07.08-47	January 10, 2012
RAI 505 — 07.08-48	January 10, 2012
RAI 505 — 07.08-49	**January 19, 2012**
RAI 505 — 07.09-71	January 10, 2012

Sincerely,

Tom Ryan for
Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Tuesday, November 22, 2011 2:51 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 3

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. On October 27, 2011, and November 17, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 33 questions and a preliminary revised schedule for Question 07.01-33.

After discussions with NRC staff, the attached file, "RAI 505 Supplement 3 Response US EPR DC.pdf" provides technically correct and complete responses to 4 of the 34 questions. Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the responses to RAI 505 Question 07.07-23, Question 07.08 -46 and Question 07.09.02-72.

The following table indicates the respective pages in the response document, "RAI 505 Supplement 3 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.01-43	2	3
RAI 505 — 07.07-23	4	4
RAI 505 — 07.08-46	5	5
RAI 505 — 07.09-72	6	7

The schedule for the response to the remaining 30 questions remains unchanged, as indicated below. In addition, the preliminary revised schedule for a response to Question 07.01-33 remains unchanged. The schedule for Question 07.01-33 is being reevaluated and a new supplement with a revised schedule will be transmitted by December 14, 2011.

Question #	Response Date
RAI 505 — 07.01-33	December 14, 2011
RAI 505 — 07.01-34	January 10, 2012
RAI 505 — 07.01-35	January 10, 2012
RAI 505 — 07.01-36	January 10, 2012
RAI 505 — 07.01-37	December 11, 2011
RAI 505 — 07.01-38	January 10, 2012
RAI 505 — 07.01-39	January 10, 2012
RAI 505 — 07.01-40	January 10, 2012

RAI 505 — 07.01-41	January 10, 2012
RAI 505 — 07.01-42	January 10, 2012
RAI 505 — 07.01-44	January 10, 2012
RAI 505 — 07.01-45	January 10, 2012
RAI 505 — 07.01-46	January 10, 2012
RAI 505 — 07.01-47	January 10, 2012
RAI 505 — 07.01-48	January 10, 2012
RAI 505 — 07.01-49	January 10, 2012
RAI 505 — 07.01-50	January 10, 2012
RAI 505 — 07.01-51	January 10, 2012
RAI 505 — 07.03-37	December 11, 2011
RAI 505 — 07.03-38	January 10, 2012
RAI 505 — 07.04-15	December 11, 2011
RAI 505 — 07.05-10	December 11, 2011
RAI 505 — 07.05-11	December 11, 2011
RAI 505 — 07.08-43	December 11, 2011
RAI 505 — 07.08-44	January 10, 2012
RAI 505 — 07.08-45	January 10, 2012
RAI 505 — 07.08-47	January 10, 2012
RAI 505 — 07.08-48	January 10, 2012
RAI 505 — 07.08-49	December 11, 2011
RAI 505 — 07.09-71	January 10, 2012

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, November 17, 2011 5:44 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 2

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for technically correct and complete responses to the 34 questions in RAI 505. On October 27, 2011, AREVA NP provided a revised schedule for technically correct and complete responses to 13 questions and a preliminary revised schedule for Question 07.01-33.

The schedule for the final responses has been revised, as indicated in bold below. In addition, the preliminary revised schedule for a response to Question 07.01-33 has been revised. The schedule for Question 07.01-33 is being reevaluated and a new supplement with a revised schedule will be transmitted by December 14, 2011.

Question #	Response Date
RAI 505 — 07.01-33	**December 14, 2011**
RAI 505 — 07.01-34	**January 10, 2012**
RAI 505 — 07.01-35	**January 10, 2012**
RAI 505 — 07.01-36	**January 10, 2012**
RAI 505 — 07.01-37	**December 11, 2011**
RAI 505 — 07.01-38	January 10, 2012
RAI 505 — 07.01-39	**January 10, 2012**
RAI 505 — 07.01-40	**January 10, 2012**
RAI 505 — 07.01-41	**January 10, 2012**
RAI 505 — 07.01-42	**January 10, 2012**
RAI 505 — 07.01-43	**December 11, 2011**
RAI 505 — 07.01-44	January 10, 2012
RAI 505 — 07.01-45	January 10, 2012
RAI 505 — 07.01-46	January 10, 2012
RAI 505 — 07.01-47	January 10, 2012
RAI 505 — 07.01-48	January 10, 2012
RAI 505 — 07.01-49	January 10, 2012
RAI 505 — 07.01-50	January 10, 2012
RAI 505 — 07.01-51	January 10, 2012
RAI 505 — 07.03-37	**December 11, 2011**
RAI 505 — 07.03-38	January 10, 2012
RAI 505 — 07.04-15	**December 11, 2011**
RAI 505 — 07.05-10	**December 11, 2011**
RAI 505 — 07.05-11	**December 11, 2011**
RAI 505 — 07.07-23	**December 11, 2011**
RAI 505 — 07.08-43	**December 11, 2011**
RAI 505 — 07.08-44	**January 10, 2012**
RAI 505 — 07.08-45	**January 10, 2012**
RAI 505 — 07.08-46	**December 11, 2011**
RAI 505 — 07.08-47	January 10, 2012
RAI 505 — 07.08-48	January 10, 2012
RAI 505 — 07.08-49	**December 11, 2011**
RAI 505 — 07.09-71	**January 10, 2012**
RAI 505 — 07.09-72	**January 10, 2012**

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager

AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, October 27, 2011 11:22 AM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 1

Getachew,

On September 29, 2011, AREVA NP Inc. provided a schedule for a technically correct and complete response to the 34 questions in RAI 505.

The schedule for the final response to Questions 07.01-38, 07.01-44, 07.01-45, 07.01-46, 07.01-47, 07.01-48, 07.01-49, 07.01-50, 07.01-51, 07.03-38, 07.08-43, 07.08-47, 07.08-48 has been revised, as indicated in bold below. In addition, a preliminary revised schedule for a technically correct and complete response to Question 07.01-33 is provided below. The schedule for Question 07.01-33 is being reevaluated and a new supplement with a revised schedule will be transmitted by November 17, 2011.

Question #	Response Date
RAI 505 — 07.01-33	**November 17, 2011**
RAI 505 — 07.01-34	December 8, 2011
RAI 505 — 07.01-35	November 17, 2011
RAI 505 — 07.01-36	December 8, 2011
RAI 505 — 07.01-37	December 8, 2011
RAI 505 — 07.01-38	**January 10, 2012**
RAI 505 — 07.01-39	December 8, 2011
RAI 505 — 07.01-40	December 8, 2011
RAI 505 — 07.01-41	November 17, 2011
RAI 505 — 07.01-42	December 20, 2011
RAI 505 — 07.01-43	November 17, 2011
RAI 505 — 07.01-44	**January 10, 2012**
RAI 505 — 07.01-45	**January 10, 2012**
RAI 505 — 07.01-46	**January 10, 2012**
RAI 505 — 07.01-47	**January 10, 2012**
RAI 505 — 07.01-48	**January 10, 2012**
RAI 505 — 07.01-49	**January 10, 2012**
RAI 505 — 07.01-50	**January 10, 2012**
RAI 505 — 07.01-51	**January 10, 2012**
RAI 505 — 07.03-37	November 17, 2011
RAI 505 — 07.03-38	**January 10, 2012**
RAI 505 — 07.04-15	November 17, 2011

RAI 505 — 07.05-10	November 17, 2011
RAI 505 — 07.05-11	November 17, 2011
RAI 505 — 07.07-23	November 17, 2011
RAI 505 — 07.08-43	**January 10, 2012**
RAI 505 — 07.08-44	December 8, 2011
RAI 505 — 07.08-45	December 8, 2011
RAI 505 — 07.08-46	December 8, 2011
RAI 505 — 07.08-47	**January 10, 2012**
RAI 505 — 07.08-48	**January 10, 2012**
RAI 505 — 07.08-49	November 17, 2011
RAI 505 — 07.09-71	December 8, 2011
RAI 505 — 07.09-72	December 8, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Thursday, September 29, 2011 11:04 AM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 505 Response US EPR DC.pdf," provides a schedule since a technically correct and complete response to the 34 questions cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 505 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 505 — 07.01-33	2	2
RAI 505 — 07.01-34	3	3
RAI 505 — 07.01-35	4	4
RAI 505 — 07.01-36	5	5
RAI 505 — 07.01-37	6	6
RAI 505 — 07.01-38	7	7
RAI 505 — 07.01-39	8	8
RAI 505 — 07.01-40	9	9

RAI 505 — 07.01-41	10	10
RAI 505 — 07.01-42	11	11
RAI 505 — 07.01-43	12	12
RAI 505 — 07.01-44	13	13
RAI 505 — 07.01-45	14	14
RAI 505 — 07.01-46	15	15
RAI 505 — 07.01-47	16	16
RAI 505 — 07.01-48	17	18
RAI 505 — 07.01-49	19	19
RAI 505 — 07.01-50	20	20
RAI 505 — 07.01-51	21	22
RAI 505 — 07.03-37	23	23
RAI 505 — 07.03-38	24	24
RAI 505 — 07.04-15	25	25
RAI 505 — 07.05-10	26	26
RAI 505 — 07.05-11	27	27
RAI 505 — 07.07-23	28	28
RAI 505 — 07.08-43	29	29
RAI 505 — 07.08-44	30	30
RAI 505 — 07.08-45	31	31
RAI 505 — 07.08-46	32	32
RAI 505 — 07.08-47	33	33
RAI 505 — 07.08-48	34	34
RAI 505 — 07.08-49	35	35
RAI 505 — 07.09-71	36	36
RAI 505 — 07.09-72	37	37

A complete answer is not provided for the 34 questions. The schedule for a technically correct and complete response to these questions is provided below.

Please note that the date for the response to Question 07.01-33 is a commitment date to provide a final schedule for the response in a follow-up letter.

Question #	**Response Date**
RAI 505 — 07.01-33	October 27, 2011
RAI 505 — 07.01-34	December 8, 2011
RAI 505 — 07.01-35	November 17, 2011
RAI 505 — 07.01-36	December 8, 2011
RAI 505 — 07.01-37	December 8, 2011
RAI 505 — 07.01-38	December 20, 2011
RAI 505 — 07.01-39	December 8, 2011
RAI 505 — 07.01-40	December 8, 2011
RAI 505 — 07.01-41	November 17, 2011
RAI 505 — 07.01-42	December 20, 2011
RAI 505 — 07.01-43	November 17, 2011

RAI 505 — 07.01-44	December 20, 2011
RAI 505 — 07.01-45	December 20, 2011
RAI 505 — 07.01-46	December 20, 2011
RAI 505 — 07.01-47	December 8, 2011
RAI 505 — 07.01-48	December 20, 2011
RAI 505 — 07.01-49	December 20, 2011
RAI 505 — 07.01-50	December 20, 2011
RAI 505 — 07.01-51	December 20, 2011
RAI 505 — 07.03-37	November 17, 2011
RAI 505 — 07.03-38	December 20, 2011
RAI 505 — 07.04-15	November 17, 2011
RAI 505 — 07.05-10	November 17, 2011
RAI 505 — 07.05-11	November 17, 2011
RAI 505 — 07.07-23	November 17, 2011
RAI 505 — 07.08-43	December 20, 2011
RAI 505 — 07.08-44	December 8, 2011
RAI 505 — 07.08-45	December 8, 2011
RAI 505 — 07.08-46	December 8, 2011
RAI 505 — 07.08-47	December 20, 2011
RAI 505 — 07.08-48	December 20, 2011
RAI 505 — 07.08-49	November 17, 2011
RAI 505 — 07.09-71	December 8, 2011
RAI 505 — 07.09-72	December 8, 2011

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Tuesday, August 30, 2011 1:23 PM
To: ZZ-DL-A-USEPR-DL
Cc: Zhang, Deanna; Morton, Wendell; Spaulding, Deirdre; Mott, Kenneth; Truong, Tung; Zhao, Jack; Mills, Daniel; Jackson, Terry; Canova, Michael; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on August 12, 2011, and discussed with your staff on August 22 and 25, 2011. No change is made to the draft RAI as a result of those discussions. 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: 3931

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D4C81EFD)

Subject: Response to U.S. EPR Design Certification Application RAI No. 505 (5902,5735,5869,5754,5803,5950,5744), FSAR Ch. 7, Supplement 22
Sent Date: 5/30/2012 5:30:40 PM
Received Date: 5/30/2012 5:32:13 PM
From: WILLIFORD Dennis (AREVA)

Created By: Dennis.Williford@areva.com

Recipients:
"BENNETT Kathy (AREVA)" <Kathy.Bennett@areva.com>
Tracking Status: None
"DELANO Karen (AREVA)" <Karen.Delano@areva.com>
Tracking Status: None
"ROMINE Judy (AREVA)" <Judy.Romine@areva.com>
Tracking Status: None
"RYAN Tom (AREVA)" <Tom.Ryan@areva.com>
Tracking Status: None
"Tesfaye, Getachew" <Getachew.Tesfaye@nrc.gov>
Tracking Status: None

Post Office: auscharmx02.adom.ad.corp

Files	**Size**	**Date & Time**
MESSAGE	81657	5/30/2012 5:32:13 PM
RAI 505 Supplement 22 Response US EPR DC - INTERIM.pdf	4219531	

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

Response to

Request for Additional Information No. 505, Supplement 22

8/30/2011

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 07.01 - Instrumentation and Controls - Introduction
SRP Section: 07.03 - Engineered Safety Features Systems
SRP Section: 07.04 - Safe Shutdown Systems
SRP Section: 07.05 - Information Systems Important to Safety
SRP Section: 07.07 - Control Systems
SRP Section: 07.08 - Diverse Instrumentation and Control Systems
SRP Section: 07.09 - Data Communication Systems

Application Section: FSAR Chapter 7

QUESTIONS for Instrumentation, Controls and Electrical Engineering 1 (AP1000/EPR Projects) (ICE1)

Question 07.01-35:

OPEN ITEM

Provide failure modes and effects analysis (FMEA) and ITAAC to perform the FMEA for the Safety Automation System (SAS) to verify design commitments made in U.S. EPR FSAR, Tier 2, Section 7.1.

10 CFR 50.55a(h) incorporates by reference IEEE Std. 603-1991. As part of an alternative request, the applicant proposes to use IEEE Std. 603-1998. Clause 5.1 of IEEE Std. 603-1998 require, in part, that safety systems perform all safety functions in the presence of any single detectable failure, all failures caused by a single failure, and all failures or spurious actuations caused by a design basis event. In Tier 2, Section 7.1.2.6.12, the applicant states that an FMEA was performed for the PS and described in ANP-10309P, as a means of meeting the requirements of IEEE Std. 603-1998, Clause 5.1. An FMEA is a typical method of analysis used to demonstrate compliance with single failure criteria of IEEE Std. 603-1998, Clause 5.1. The staff review of the PS FMEA determined that the SAS functionality, as it pertains to ESF functionality, is not addressed in the analysis. The applicant did not state in Section 7.1.2.6.12 that an FMEA was performed for SAS. SAS provides safety-related functions relating to safe shutdown support as well as providing safety-related interlocks for numerous other safety systems. The staff review of Tier 1, Section 2.4.4, determined that there was no ITAAC item verifying the performance of a SAS FMEA, similar to that of the PS ITAAC item provided in Section 2.4.1.

Due to the safety significance of SAS, the staff requests the applicant provide an FMEA, or similar single failure analysis, for SAS that demonstrates SAS failure modes have been accounted for in the U.S. EPR design. The staff also requests the applicant provide an ITAAC item verifying the performance of the SAS FMEA.

Response to Question 07.01-35:

A system-level failure modes and effects analysis (FMEA) was performed on the safety automation system (SAS) to identify potential single-point failures and their consequences. The architecture of the SAS is redundant by the means of the use of redundant control units and divisional redundancy. The system is designed so that a single failure during corrective or periodic maintenance, or a single failure and the effects of an internal hazard, do not prevent performance of the safety functions. The FMEA for SAS has been incorporated into the U.S. EPR FSAR Tier 2, Section 7.1, Table 7.1-7 as described in the response to RAI, Question 07.01-36.

The SAS logic diagrams and descriptions have been developed and will be incorporated into the U.S. EPR FSAR Tier 2, Section 7.3 (for SAS Control Functions) and Section 7.6 (for SAS Interlock Functions). An inspections, tests, analyses, and acceptance criteria (ITAAC) item for the SAS FMEA, similar to that of the protection system ITAAC provided in U.S. EPR FSAR Tier 1, Section 2.4.1, was included in U. S. EPR FSAR Tier 1, Section 2.4.4, Item 4.10, as part of the response to RAI 452, Supplement 5 on June 22, 2011. This Tier 1 information has been updated to include conforming changes to match the addition of the SAS logic diagrams.

Conforming changes due to this response to other U.S. EPR FSAR Chapters 3, 6, 8, 9 and 14 are also included in this response to this RAI. These changes include mark-ups of the

corresponding Mechanical System design descriptions in Tier 1 and Chapter 9 to reflect the additional design detail associated with each of the SAS I&C Logic Diagrams. Also included were conforming changes to Chapter 8 and 14 to reflect the corresponding mechanical changes. The inclusion of the additional design details also involved updating the Chapter 3 tables in Sections 3.2, 3.10, and 3.11 for Classification, Seismically Qualified Mechanical Equipment, and Environmentally Qualified Electrical/I&C Equipment.

Additional conforming changes are in process for U.S. EPR FSAR Tier 2, Section 7.6 and corresponding Figures 7.6-2, 7.6-3, and 7.6-11. Final markups to this section and figures will be provided in a future supplement.

FSAR Impact:

U.S. EPR FSAR, Tier 1, Sections 2.4.4, 2.4.25, 2.6.1, 2.6.3, 2.6.6, 2.6.7, 2.6.8, 2.6.9, and 2.6.13 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR FSAR, Tier 2, Sections 6.2.3, 7.3, 7.6, 8.3, 9.1.3, 9.2.2, 9.4.1, 9.4.2, 9.4.3, 9.4.5, 9.4.6, 9.4.9, 9.4.11 and 14.2 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR FSAR, Tier 2, Tables 3.2.2-1, 3.10-1, 3.11-1, 3.11-2 and 7.1-5 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR FSAR, Tier 2, Table 7.1-7 will be added as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

Table 2.4.4-2— Safety Automation System Automatic Functions and Input Variables (7 Sheets)

Table System	Function Name	Input Variable
Annulus Ventilation System (AVS)	Accident Filtration Train Heater Control	Isolation Damper Position
		Heater Fan Running
	Accident Train Switchover	Pressure
		Post Heater Temperature
		Filter Bank Isolation Inlet Damper Position
		Filter Bank Isolation Outlet Damper Position
		Exhaust Fan Signal
Component Cooling Water System (CCWS)	CCWS Common 1.b Automatic Backup Switchover of Train 1 to Train 2 and Train 2 to Train 1	Train 1 Loss of ESWS Signal
		Train 1 Pump Pressure
		Train 1 Flow Rate
		Train 2 Loss of ESWS Signal
		Train 2 Pump Pressure
		Train 2 Flow Rate
	CCWS Common 2.b Automatic Backup Switchover of Train 3 to Train 4 and Train 4 to Train 3	Train 3 Loss of ESWS Signal
		Train 3 Pump Pressure
		Train 3 Flow Rate
		Train 4 Loss of ESWS Signal
		Train 4 Pump Pressure
		Train 4 Flow Rate
	CCWS Emergency Temperature Control	Heat Exchanger Temp
		Heat Exchanger Bypass Valve Position
	CCWS Emergency Leak Detection	Surge Tank Level
		CCWS Chiller Inlet Flow
		CCWS Chiller Outlet Flow
		Common Supply Outlet Flow
		Common Supply Inlet Flow
	CCWS Emergency Leak Detection – Switchover Valves	Surge Tank 1 Level
		Surge Tank 2 Level

Table 2.4.4-2— Safety Automation System Automatic Functions and Input Variables (7 Sheets)

Table System	Function Name	Input Variable
	Leakage or Failure	Surge Tank 3 Level
		Surge Tank 4 Level
	CCWS Switchover Valves Interlock	Train 1 Common 1a Supply Valve Position
		Train 1 Common 1a Return Valve Position
		Train 1 Common 1b Supply Valve Position
		Train 1 Common 1b Return Valve Position
		Train 2 Common 1a Supply Valve Position
		Train 2 Common 1a Return Valve Position
		Train 2 Common 1b Supply Valve Position
		Train 2 Common 1b Return Valve Position
		Train 3 Common 1a Supply Valve Position
		Train 3 Common 1a Return Valve Position
		Train 3 Common 1b Supply Valve Position
		Train 3 Common 1b Return Valve Position
		Train 4 Common 1a Supply Valve Position
		Train 4 Common 1a Return Valve Position
		Train 4 Common 1b Supply Valve Position
		Train 4 Common 1b Return Valve Position
	CCWS RCP Thermal Barrier Containment Isolation Valve	Common 1b Return Outer Valve Position

Table 2.4.4-2— Safety Automation System Automatic Functions and Input Variables (7 Sheets)

Table System	Function Name	Input Variable
		Common 2b Return Outer Valve Position
		Common 2b Supply Outer Valve Position
		Common 1b Return Inner Valve Position
		Common 1b Supply Inner Valve Position
		Common 2b Return Inner Valve Position
		Common 2b Supply Inner Valve Position
	SCWS Condenser Supply Water Flow Control	Condenser Refrigerant Pressure
Emergency Feedwater System (EFWS)	SG Closed Loop Level Control	SG Level
	Pump Flow Protection	Pump Flow Signal
Essential Service Water Pump Building Ventilation System (ESWPBVS)	ESWPBVS ESWS Pump Rooms Temperature Control	Outside Air Temperature
Fuel Building Ventilation System (FBVS)	Safety-Related Room Heater Control	Room Temperature
	FBVS EBS / FPCS Pump Rooms Heat Removal	Recirculation Temperature
	Isolation of FBVS on Containment Isolation	Containment Isolation Signal
	Fuel Pool Area Handling Accident	Fuel Building Ventilation Activity
	Reactor Building Fuel Handling Accident	Containment Building Ventilation Activity
Fuel Pool Cooling and Purification System (FPCPS)	FPCPS Pump Trip on Low Spent Fuel Pool (SFP) Level	SFP Level (WR)
In-Containment Refueling Water Storage Tank System (IRWST)	IRWST Boundary Isolation for Preserving IRWST Water Inventory Interlock	IRWST Level
Main Control Room Air Conditioning System	Iodine Filtration Train Heater Control	Carbon Filter Isolation Damper Position

Table 2.4.4-2— Safety Automation System Automatic Functions and Input Variables (7 Sheets)

Table System	Function Name	Input Variable
(CRACS)		Protective Switch Temperature
		ESF Filtration Status
	Heater Control for Outside Inlet Air	Downstream Temperature
		Inlet Damper Position
		Outlet Damper Position
	Pressure Control	MCR Differential Pressure
	Cooler Temperature Control	Supply Air Temperature
Main Steam System (MSS)	Steam Generator MSRCV Regulation during Pressure Control	MSRIV Position
		MSRIV Actuation Signal (from PS)
		MSRT Setpoint (from PS)
		SG Pressure
	Steam Generator MSRCV Regulation during Standby Position Pressure Control	MSRCV Position
		Nuclear Power Calculation (from PS)
Safeguard Building Controlled-Area Ventilation System (SBVS)	SIS/RHRS Pump Rooms Heat Removal	LHSI Pump Room Temperature
		MHSI Pump Room Temperature
		SIS/RHR Pump Running Signal
		SIS/RHR Pump Stopped Signal
	CCWS/EFWS Valve Rooms Heat Removal	Room Temperature
Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply and Recirculation Exhaust Air Flow Control	Supply Air Temperature Downstream of Heaters
		Protective Switch Temperature
		Outside Air Temperature
		Outside Air Damper Open Position Signal
		Outside Air Damper Closed Position Signal

Table 2.4.4-2— Safety Automation System Automatic Functions and Input Variables (7 Sheets)

Table System	Function Name	Input Variable
		Exhaust Damper Open Position Signal
		Exhaust Damper Closed Position Signal
		Recirculation Damper Open Position Signal
		Recirculation Damper Closed Position Signal
	Supply Fan Safe Shut-off	Recirc / Exhaust Fan Stopped Signal
		Outside Air Damper Closed Position Signal
		Recirculation Damper Closed Position Signal
	Recirculation Fan Safe Shut-off	CCW Pump Room Temperature
		EFW Pump Room Temperature
	Exhaust Fan Safe Shut-off	Exhaust Damper Closed Position
	Supply Air Temperature Heater Control	Supply Air Downstream of Heaters Temperature
		Filter Bank Differential Pressure
	Freeze Protection – Supply Air Temperature	Outside Air Temperature
	Supply Air Temperature Control for Supply Air Cooling	Supply Air Downstream of Humidifier Temperature
	Battery Room Heater Control	Battery Room Temperature
	Battery Room Supply Air Temperature Control	Battery Room Supply Air Temperature
	Emergency Feed Water System (EFWS) Pump Room Heat Removal	EFWS Pump Room Temperature
	Component Cooling Water System (CCWS) Pump Room Heat Removal	CCWS Pump Room Temperature

Table 2.4.4-2— Safety Automation System Automatic Functions and Input Variables (7 Sheets)

Table System	Function Name	Input Variable
	Component Cooling Water System (CCWS) Pump Room Heat Removal	CCWS Pump Room Temperature
Safety Chilled Water System (SCWS)	SCWS Train 1 to Train 2 Switchover on Train 1 Low Evaporator Flow / Chiller Black Box Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-start Failure Interlock	Train 1 Chiller Evaporator Outlet Temperature
		Train 1 Chiller Compressor Oil Pressure
		Train 1 Condenser Refrigerant Pressure
		Train 1 Chiller Evaporator Flow Signal
		Train 1 Cross-Tie Valves Position Signal
		Train 2 Cross-Tie Valves Position Signal
		Train 2 Circulating Pump 1 Running Signal
		Train 2 Circulating Pump 2 Running Signal
		Train 2 Evaporator ΔP Signal
		Train 2 Chiller Evaporator Flow Signal
	SCWS Train 2 to Train 1 Switchover on Train 2 Low Evaporator Flow / Chiller Black Box Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-start Failure Interlock	Train 1 Circulating Pump 1 Running Signal
		Train 1 Circulating Pump 2 Running Signal
		Train 1 Evaporator ΔP Signal
		Train 1 Chiller Evaporator Flow Signal
		Train 1 Cross-Tie Valves Position Signal
		Train 2 Cross-Tie Valves Position Signal
		Train 2 Chiller Evaporator Flow Signal
		Train 2 Condenser Refrigerant Pressure

Table 2.4.4-2— Safety Automation System Automatic Functions and Input Variables (7 Sheets)

Table System	Function Name	Input Variable
		Train 2 Chiller Compressor Oil Pressure
		Train 2 Chiller Evaporator Outlet Temperature
		Train 2 Condenser Flow Rate Signal
	SCWS Train 3 to Train 4 Switchover on Train 3 Low Evaporator Flow / Chiller Black Box Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-start Failure Interlock	Train 3 Condenser Flow Rate Signal
		Train 3 Chiller Evaporator Outlet Temperature
		Train 3 Chiller Compressor Oil Pressure
		Train 3 Condenser Refrigerant Pressure
		Train 3 Chiller Evaporator Flow Signal
		Train 3 Cross-Tie Valves Position Signal
		Train 4 Cross-Tie Valves Position Signal
		Train 4 Circulating Pump 1 Running Signal
		Train 4 Circulating Pump 2 Running Signal
		Train 4 Evaporator ΔP Signal
		Train 4 Chiller Evaporator Flow Signal
	SCWS Train 4 to Train 3 Switchover on Train 4 Low Evaporator Flow / Chiller Black Box Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-start Failure Interlock	Train 3 Circulating Pump 1 Running Signal
		Train 3 Circulating Pump 2 Running Signal
		Train 3 Evaporator ΔP Signal
		Train 3 Chiller Evaporator Flow Signal
		Train 3 Cross-Tie Valves Position Signal

Table 2.4.4-2— Safety Automation System Automatic Functions and Input Variables (7 Sheets)

Table System	Function Name	Input Variable
		Train 4 Cross-Tie Valves Position Signal
		Train 4 Chiller Evaporator Flow Signal
		Train 4 Condenser Refrigerant Pressure
		Train 4 Chiller Compressor Oil Pressure
		Train 4 Chiller Evaporator Outlet Temperature
Safety Injection and Residual Heat Removal System (SIS/RHRS)	Automatic RHRS Flow Rate Control	RHRS Flow Rate Signal
		RHRS Temperature
		LHSI Pump Pressure
	Automatic Trip of LHSI Pump (in RHR Mode) on Low ΔPsat Interlock	Hot Leg Temperature (WR)
		Hot Leg Pressure (WR)
	Automatic Trip of LHSI Pump (in RHR Mode) on Low Loop Level Interlock	Hot Leg Loop Level
	RHR Isolation Valves Interlock	LHSI Suction Isolation Valve Position
		RHR 1st RCPB Isolation Valve Position
		RHR 2nd RCPB Isolation Valve Position

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.4.4-~~4~~3—Safety Automation System Interlocks

~~Isolation of Component Cooling Water System (CCWS) Trains~~
CCWS Switchover Valves Interlock
CCWS RCP Thermal Barrier Containment Isolation Valve Interlock
IRWST Boundary Isolation for Preserving IRWST Water Inventory Interlock
SCWS Train 1 to Train 2 Switchover on Train 1 Low Evaporator Flow / Chiller Black Box Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock
SCWS Train 2 to Train 1 Switchover on Train 2 Low Evaporator Flow / Chiller Black Box Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock
SCWS Train 3 to Train 4 Switchover on Train 3 Low Evaporator Flow / Chiller Black Box Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock
SCWS Train 4 to Train 3 Switchover on Train 4 Low Evaporator Flow / Chiller Black Box Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock -Automatic Trip of LHSI Pump (in RHR Mode) on Low ΔPsat
Automatic Trip of LHSI Pump (in RHR Mode) on Low Loop Level
RHR Isolation Valves Interlock

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals (~~2~~ 7 Sheets)

Item #	Signal	Source	# Divisions
22	Medium Head Safety Injection Flow (WR)	Safety Injection and Residual Heat Removal System	4
23	Neutron Flux from Intermediate Range Detector (IRD)	Excore Instrumentation System	4
24	Neutron Flux from Power Range Detector (PRD)	Excore Instrumentation System	4
25	Neutron Flux from Self Powered Neutron Detectors (SPND)	Incore Instrumentation System	4
26	Neutron Flux from Source Range (SRD)	Excore Instrumentation System	4
27	Pressurizer Level (NR)	Reactor Coolant System	4
28	Pressurizer Pressure (NR)	Reactor Coolant System	4
29	RCP Bus Breaker Position	Normal Power Supply System	4
30	RCP Breaker Position	Normal Power Supply System	4
31	RCS Loop Flow	Reactor Coolant System	4
33	RCS Loop Level	Reactor Coolant System	4
34	RCP Speed	Reactor Coolant System	4
35	SG Level (NR)	Reactor Coolant System	4
36	SG Level (WR)	Reactor Coolant System	4
37	SG Pressure	Main Steam System	4
38	Temperature compensated rod cluster control assembly (RCCA) positions	Rod Position Measurement System	4
39	Reactor Trip Contactor Position	Control Rod Drive Control System	4
40	Containment Hydrogen Concentration	Hydrogen Monitoring System	2
41	Core Outlet Temperature	Incore Instrumentation System	4
42	AVS Temperature	Annulus Ventilation System	2
43	AVS Isolation Damper Position	Annulus Ventilation System	2
44	AVS Heater Fan Signal	Annulus Ventilation System	2
45	AVS Pressure	Annulus Ventilation System	2
46	AVS Differential Pressure	Annulus Ventilation System	2
47	AVS Post Heater Temperature	Annulus Ventilation System	2
48	AVS Filter Bank Isolation Inlet Damper Position	Annulus Ventilation System	2

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals (~~2~~ 7 Sheets)

Item #	Signal	Source	# Divisions
49	AVS Filter Bank Isolation Outlet Damper Position	Annulus Ventilation System	2
50	AVS Exhaust Fan Signal	Annulus Ventilation System	2
51	CCWS Loss of ESWS Signal	Component Cooling Water System	4
52	CCWS Pump Pressure	Component Cooling Water System	4
53	CCWS Flow Rate	Component Cooling Water System	4
54	CCWS Heat Exchanger Temp	Component Cooling Water System	4
55	CCWS Heat Exchanger Bypass Valve Position	Component Cooling Water System	4
56	CCWS Surge Tank Level	Component Cooling Water System	4
57	CCWS Chiller Inlet Flow	Component Cooling Water System	4
58	CCWS Chiller Outlet Flow	Component Cooling Water System	4
59	CCWS Common Supply Outlet Flow	Component Cooling Water System	4
60	CCWS Common Supply Inlet Flow	Component Cooling Water System	4
61	CCWS Common 1a Supply Valve Position	Component Cooling Water System	4
62	CCWS Common 1a Return Valve Position	Component Cooling Water System	4
63	CCWS Common 1b Supply Valve Position	Component Cooling Water System	4
64	CCWS Common 1b Return Valve Position	Component Cooling Water System	4
65	CCWS Common 1b Return Outer Valve Position	Component Cooling Water System	2
66	CCWS Common 1b Supply Outer Valve Position	Component Cooling Water System	2
67	CCWS Common 2b Return Outer Valve Position	Component Cooling Water System	2

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals (~~2~~ 7 Sheets)

Item #	Signal	Source	# Divisions
68	CCWS Common 2b Supply Outer Valve Position	Component Cooling Water System	2
69	CCWS Common 1b Return Inner Valve Position	Component Cooling Water System	2
70	CCWS Common 1b Supply Inner Valve Position	Component Cooling Water System	2
71	CCWS Common 2b Return Inner Valve Position	Component Cooling Water System	2
72	CCWS Common 2b Supply Inner Valve Position	Component Cooling Water System	2
73	SCWS Condenser Refrigerant Pressure	Component Cooling Water System	2
74	EFW Pump Flow Signal	Emergency Feedwater System	4
75	ESW Outside Air Temperature	Essential Service Water Pump Building Ventilation System	4
76	FBVS Room Temperature	Fuel Building Ventilation Room Temperature System	2
77	EBS / FPCS Recirculation Temperature	Fuel Building Ventilation Room Temperature System	2
78	Spent Fuel Pool Level (WR)	Fuel Pool Cooling and Purification System	2
79	IRWST Level	In-Containment Refueling Water Storage Tank System	4
80	CRACS Carbon Filter Isolation Damper Position	Main Control Room Air Conditioning System	2
81	CRACS Protective Switch Temperature	Main Control Room Air Conditioning System	2
82	CRACS ESF Filtration Fan Status	Main Control Room Air Conditioning System	2
83	CRACS Downstream Temperature	Main Control Room Air Conditioning System	2
84	CRACS Inlet Damper Position	Main Control Room Air Conditioning System	2
85	CRACS Outlet Damper Position	Main Control Room Air Conditioning System	2

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals (~~2~~ 7 Sheets)

Item #	Signal	Source	# Divisions
86	MCR Differential Pressure	Main Control Room Air Conditioning System	2
87	CRACS Supply Air Temperature	Main Control Room Air Conditioning System	4
88	MSRIV Position	Main Steam System	4
89	MSRCV Position	Main Steam System	4
90	LHSI Pump Room Temperature	Safeguard Building Pump Room Temperature Controlled-Area Ventilation System	4
91	MHSI Pump Room Temperature	Safeguard Building Pump Room Temperature Controlled-Area Ventilation System	4
92	SIS/RHR Pump Running Signal	Safeguard Building Pump Room Temperature Controlled-Area Ventilation System	4
93	SIS/RHR Pump Stopped Signal	Safeguard Building Pump Room Temperature Controlled-Area Ventilation System	4
94	CCWS/EFWS Valve Room Temperature	Safeguard Building Pump Room Temperature Controlled-Area Ventilation System	4
95	SBVSE Supply Air Temperature Downstream of Heaters	Electrical Division of Safeguard Building Ventilation System	4
96	SBVSE Protective Switch Temperature	Electrical Division of Safeguard Building Ventilation System	4
97	SBVSE Outside Air Temperature	Electrical Division of Safeguard Building Ventilation System	4
98	SBVSE Outside Air Damper Open Position Signal	Electrical Division of Safeguard Building Ventilation System	4

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals (~~2~~ 7 Sheets)

Item #	Signal	Source	# Divisions
99	SBVSE Outside Air Damper Closed Position Signal	Electrical Division of Safeguard Building Ventilation System	4
100	SBVSE Exhaust Damper Open Position Signal	Electrical Division of Safeguard Building Ventilation System	4
101	SBVSE Exhaust Damper Closed Position Signal	Electrical Division of Safeguard Building Ventilation System	4
102	SBVSE Recirculation Damper Open Position Signal	Electrical Division of Safeguard Building Ventilation System	4
103	SBVSE Recirculation Damper Closed Position Signal	Electrical Division of Safeguard Building Ventilation System	4
104	SBVSE Recirculation / Exhaust Fan Stopped Signal	Electrical Division of Safeguard Building Ventilation System	4
105	SBVSE Outside Air Damper Closed Position Signal	Electrical Division of Safeguard Building Ventilation System	4
106	SBVSE Recirculation Damper Closed Position Signal	Electrical Division of Safeguard Building Ventilation System	4
107	SBVSE Exhaust Fan Exhaust Damper Closed Position	Electrical Division of Safeguard Building Ventilation System	4
108	Filter Bank Differential Pressure	Electrical Division of Safeguard Building Ventilation System	4
109	Supply Air Downstream of Humidifier Temperature	Electrical Division of Safeguard Building Ventilation System	4
110	Battery Room Supply Air Downstream of Heaters Flow	Electrical Division of Safeguard Building Ventilation System	4
111	Battery Room Temperature	Electrical Division of Safeguard Building Ventilation System	4

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals (~~2~~ 7 Sheets)

Item #	Signal	Source	# Divisions
112	Battery Room Supply Air Temperature	Electrical Division of Safeguard Building Ventilation System	4
113	EFWS Pump Room Temperature	Electrical Division of Safeguard Building Ventilation System	4
114	CCWS Pump Room Temperature	Electrical Division of Safeguard Building Ventilation System	4
115	SCWS Chiller Evaporator Outlet Temperature	Safety Chilled Water System	4
116	SCWS Chiller Compressor Oil Pressure	Safety Chilled Water System	4
117	SCWS Condenser Refrigerant Pressure	Safety Chilled Water System	4
118	SCWS Chiller Evaporator Flow Signal	Safety Chilled Water System	4
119	SCWS Cross-Tie Valves Position Signal	Safety Chilled Water System	4
120	SCWS Circulating Pump 1 Running Signal	Safety Chilled Water System	4
121	SCWS Circulating Pump 2 Running Signal	Safety Chilled Water System	4
122	SCWS Evaporator ΔP Signal	Safety Chilled Water System	4
123	SCWS Chiller Evaporator Flow Signal	Safety Chilled Water System	4
124	RHRS Flow Rate Signal	Safety Injection and Residual Heat Removal System	4
125	RHRS Temperature	Safety Injection and Residual Heat Removal System	4
126	LHSI Pump Pressure	Safety Injection and Residual Heat Removal System	4
127	Hot Leg Loop Level	Safety Injection and Residual Heat Removal System	4
128	Containment Isolation Signal	Fuel Building Ventilation System	4
129	Fuel Building Ventilation Activity	Fuel Building Ventilation System	4
130	Containment Building Ventilation Activity	Fuel Building Ventilation System	4
131	LHSI Suction Isolation Valve Position	Safety Injection and Residual Heat Removal System	4

Table 2.4.25-2—Signal Conditioning and Distribution System Input Signals (~~2~~ 7 Sheets)

Item #	Signal	Source	# Divisions
132	RHR 1st RCPB Isolation Valve Position	Safety Injection and Residual Heat Removal System	4
133	RHR 2nd RCPB Isolation Valve Position	Safety Injection and Residual Heat Removal System	4

Table 2.4.25-3—Signal Conditioning and Distribution System Output Signals (8~~2~~ Sheets)

Item #	Signal	~~Destination~~Recipient	# Divisions
19	Low Head Safety Injection Flow (WR)	Safety Information and Control System	4
20	Main Control Room (MCR) Air Intake Activity	Protection System	4
21	Main Steam Line Activity	Protection System, Safety Information and Control System	4
22	Medium Head Safety Injection Flow (WR)	Safety Information and Control System	4
23	Neutron Flux from Intermediate Range Detector (IRD)	Protection System, Safety Information and Control System	4
24	Neutron Flux from Power Range Detector (PRD)	Protection System, ~~Safety Automation System,~~ Diverse Actuation System	4
25	Neutron Flux from Self Powered Neutron Detectors (SPND)	Protection System	4
26	Neutron Flux from Source Range (SRD)	Safety Information and Control System	4
27	Pressurizer Level (NR)	Protection System	4
28	Pressurizer Pressure (NR)	Protection System, Safety Information and Control System, Diverse Actuation System	4
29	RCP Bus Breaker Position	Protection System	4
30	RCP Breaker Position	Protection System	4
31	RCS Loop Flow	Protection System, Diverse Actuation System	4
33	RCS Loop Level	Protection System	4
34	RCP Speed	Protection System	4
35	SG Level (NR)	Protection System, Diverse Actuation System	4
36	SG Level (WR)	Protection System, Diverse Actuation System Safety Information and Control System, Safety Automation System	4

Table 2.4.25-3—Signal Conditioning and Distribution System Output Signals (8~~2~~ Sheets)

Item #	Signal	~~Destination~~Recipient	# Divisions
37	SG Pressure	Protection System, Safety Information and Control System, Safety Automation System, Diverse Actuation System	4
38	Temperature compensated rod cluster control assembly (RCCA) positions	Protection System	4
39	Reactor Trip Contactor Position	Protection System	4
40	Containment Hydrogen Concentration	Protection System	2
41	Core Outlet Temperature	Protection System	4
42	AVS Temperature	Safety Automation System	2
43	AVS Isolation Damper Position	Safety Automation System	2
44	AVS Heater Fan Signal	Safety Automation System	2
45	AVS Pressure	Safety Automation System	2
46	AVS Differential Pressure	Safety Automation System	2
47	AVS Post Heater Temperature	Safety Automation System	2
48	AVS Filter Bank Isolation Inlet Damper Position	Safety Automation System	2
49	AVS Filter Bank Isolation Outlet Damper Position	Safety Automation System	2
50	AVS Exhaust Fan Signal	Safety Automation System	2
51	CCWS Loss of ESWS Signal	Safety Automation System	4
52	CCWS Pump Pressure	Safety Automation System	4
53	CCWS Flow Rate	Safety Automation System	4
54	CCWS Heat Exchanger Temp	Safety Automation System	4
55	CCWS Heat Exchanger Bypass Valve Position	Safety Automation System	4
56	CCWS Surge Tank Level	Safety Automation System	4
57	CCWS Chiller Inlet Flow	Safety Automation System	4

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.4.25-3—Signal Conditioning and Distribution System Output Signals (8~~2~~ Sheets)

Item #	Signal	~~Destination~~Recipient	# Divisions
58	CCWS Chiller Outlet Flow	Safety Automation System	4
59	CCWS Common Supply Outlet Flow	Safety Automation System	4
60	CCWS Common Supply Inlet Flow	Safety Automation System	4
61	CCWS Common 1a Supply Valve Position	Safety Automation System	4
62	CCWS Common 1a Return Valve Position	Safety Automation System	4
63	CCWS Common 1b Supply Valve Position	Safety Automation System	4
64	CCWS Common 1b Return Valve Position	Safety Automation System	4
65	CCWS Common 1b Return Outer Valve Position	Safety Automation System	2
66	CCWS Common 1b Supply Outer Valve Position	Safety Automation System	2
67	CCWS Common 2b Return Outer Valve Position	Safety Automation System	2
68	CCWS Common 2b Supply Outer Valve Position	Safety Automation System	2
69	CCWS Common 1b Return Inner Valve Position	Safety Automation System	2
70	CCWS Common 1b Supply Inner Valve Position	Safety Automation System	2
71	CCWS Common 2b Return Inner Valve Position	Safety Automation System	2
72	CCWS Common 2b Supply Inner Valve Position	Safety Automation System	2
73	SCWS Condenser Refrigerant Pressure	Safety Automation System	2
74	EFW Pump Flow Signal	Safety Automation System	4
75	ESW Outside Air Temperature	Safety Automation System	4

Table 2.4.25-3—Signal Conditioning and Distribution System Output Signals (8~~2~~ Sheets)

Item #	Signal	~~Destination~~Recipient	# Divisions
76	FBVS Room Temperature	Safety Automation System	2
77	EBS / FPCS Recirculation Temperature	Safety Automation System	2
78	Spent Fuel Pool Level (WR)	Safety Automation System	2
79	IRWST Level	Safety Automation System	4
80	CRACS Carbon Filter Isolation Damper Position	Safety Automation System	2
81	CRACS Protective Switch Temperature	Safety Automation System	2
82	CRACS ESF Filtration Fan Status	Safety Automation System	2
83	CRACS Downstream Temperature	Safety Automation System	2
84	CRACS Inlet Damper Position	Safety Automation System	2
85	CRACS Outlet Damper Position	Safety Automation System	2
86	MCR Differential Pressure	Safety Automation System	2
87	CRACS Supply Air Temperature	Safety Automation System	4
88	MSRIV Position	Safety Automation System	4
89	MSRCV Position	Safety Automation System	4
90	LHSI Pump Room Temperature	Safety Automation System	4
91	MHSI Pump Room Temperature	Safety Automation System	4
92	SIS/RHR Pump Running Signal	Safety Automation System	4
93	SIS/RHR Pump Stopped Signal	Safety Automation System	4
94	CCWS/EFWS Valve Room Temperature	Safety Automation System	4

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.4.25-3—Signal Conditioning and Distribution System Output Signals (8~~2~~ Sheets)

Item #	Signal	~~Destination~~Recipient	# Divisions
95	SBVSE Supply Air Temperature Downstream of Heaters	Safety Automation System	4
96	SBVSE Protective Switch Temperature	Safety Automation System	4
97	SBVSE Outside Air Temperature	Safety Automation System	4
98	SBVSE Outside Air Damper Open Position Signal	Safety Automation System	4
99	SBVSE Outside Air Damper Closed Position Signal	Safety Automation System	4
100	SBVSE Exhaust Damper Open Position Signal	Safety Automation System	4
101	SBVSE Exhaust Damper Closed Position Signal	Safety Automation System	4
102	SBVSE Recirculation Damper Open Position Signal	Safety Automation System	4
103	SBVSE Recirculation Damper Closed Position Signal	Safety Automation System	4
104	SBVSE Recirculation / Exhaust Fan Stopped Signal	Safety Automation System	4
105	SBVSE Outside Air Damper Closed Position Signal	Safety Automation System	4
106	SBVSE Recirculation Damper Closed Position Signal	Safety Automation System	4
107	SBVSE Exhaust Fan Exhaust Damper Closed Position	Safety Automation System	4
108	Filter Bank Differential Pressure	Safety Automation System	4
109	Supply Air Downstream of Humidifier Temperature	Safety Automation System	4
110	Battery Room Supply Air Downstream of Heaters Flow	Safety Automation System	4

Table 2.4.25-3—Signal Conditioning and Distribution System Output Signals (8~~2~~ Sheets)

Item #	Signal	~~Destination~~Recipient	# Divisions
111	Battery Room Temperature	Safety Automation System	4
112	Battery Room Supply Air Temperature	Safety Automation System	4
113	EFWS Pump Room Temperature	Safety Automation System	4
114	CCWS Pump Room Temperature	Safety Automation System	4
115	SCWS Chiller Evaporator Outlet Temperature	Safety Automation System	4
116	SCWS Chiller Compressor Oil Pressure	Safety Automation System	4
117	SCWS Condenser Refrigerant Pressure	Safety Automation System	4
118	SCWS Chiller Evaporator Flow Signal	Safety Automation System	4
119	SCWS Cross-Tie Valves Position Signal	Safety Automation System	4
120	SCWS Circulating Pump 1 Running Signal	Safety Automation System	4
121	SCWS Circulating Pump 2 Running Signal	Safety Automation System	4
122	SCWS Evaporator ΔP Signal	Safety Automation System	4
123	SCWS Chiller Evaporator Flow Signal	Safety Automation System	4
124	RHRS Flow Rate Signal	Safety Automation System	4
125	RHRS Temperature	Safety Automation System	4
126	LHSI Pump Pressure	Safety Automation System	4
127	Hot Leg Loop Level	Safety Automation System	4
128	Containment Isolation Signal	Safety Automation System	4
129	Fuel Building Ventilation Activity	Safety Automation System	4
130	Containment Building Ventilation Activity	Safety Automation System	4

Table 2.4.25-3—Signal Conditioning and Distribution System Output Signals (8~~2~~ Sheets)

Item #	Signal	~~Destination~~Recipient	# Divisions
131	LHSI Suction Isolation Valve Position	Safety Automation System	4
132	RHR 1st RCPB Isolation Valve Position	Safety Automation System	4
133	RHR 2nd RCPB Isolation Valve Position	Safety Automation System	4

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.6.1-2—Main Control Room Air Conditioning System Equipment I&C and Electrical Design (5 Sheets)

Description	Tag Number [1]	Location	IEEE Class 1E [2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Protective Switch-off Temperature for Electric Heaters	30SAB01CT002 30SAB04CT002	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Temp / Temp	N/A
Temperature Downstream of Electric Heaters	30SAB01CT003/004 30SAB04CT003/004	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Temp / Temp	N/A
Main Control Room Temperature	30SAB32CT002 30SAB32CT003	Safeguard Building 2	N/A	N/A	Temp / Temp	N/A
Temperature Downstream of Iodine Train Heaters	30SAB11CT002 30SAB14CT002	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Temp / Temp	N/A
Temperature Upstream of Iodine Train Heaters	30SAB11CT001~~3~~ 30SAB14CT001~~3~~	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Temp / Temp	N/A
Temperature Upstream of Electric Heaters	30SAB01CT001 30SAB04CT001	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Temp / Temp	N/A
Temperature Downstream of Carbon Adsorber	30SAB11CT003 30SAB14CT003	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Temp / Temp	N/A
Conditioning Trains Air Flow	30SAB01/02CF001 30SAB03/04CF001	Safeguard Building 2 Safeguard Building 3	N/A	N/A	Flow/Flow	N/A

Table 2.6.3-1—Annulus Ventilation System Equipment Mechanical Design

Description	Tag Number [1]	Location	ASME AG-1 Code	Function	Seismic Category
Normal Operation Train					
Motor Operated Supply Air Dampers	30KLB34AA002 30KLB34AA003	30UFA21095 30UFA21095	Yes	Close	I
Motor Operated Exhaust Air Dampers	30KLB44AA002 30KLB44AA003	30UFA29054 30UFA29054	Yes	Close	I
Accident Filtration Train					
Motor Operated Dampers	30KLB21AA003 30KLB24AA003	30UFA17084 30UFA17082	Yes	Open	I
Electric Heaters Two stage	30KLB21AH001A/B 30KLB24AH001 A/B	30UFA17084 30UFA17082	Yes	On	I
Prefilters	30KLB21AT001 30KLB24AT001	30UFA17084 30UFA17082	Yes	N/A	I
Upstream HEPA Filters	30KLB21AT002 30KLB24AT002	30UFA17084 30UFA17082	Yes	N/A	I
Carbon Absorbers	30KLB21AT003 30KLB24AT003	30UFA17084 30UFA17082	Yes	N/A	I
Downstream HEPA Filters	30KLB21AT004 30KLB24AT004	30UFA17084 30UFA17082	Yes	N/A	I
Motor Operated Dampers	30KLB21AA004 30KLB24AA004	30UFA17084 30UFA17082	Yes	Open	I
Exhaust Fans	30KLB21AN001 30KLB24AN001	30UFA17083 30UFA17081	Yes	Run	I
Backdraft Dampers	30KLB21AA006 30KLB24AA006	30UFA17083 30UFA17081	Yes	N/A	I

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

Table 2.6.3-2—Annulus Ventilation System Equipment I&C and Electrical Design (3 Sheets)

Description	Tag Number [1]	Location	IEEE Class 1E [2]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Exhaust Fan	30KLB21AN001	Fuel Building	Division 1[N] Division 2[A]	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Exhaust Fan	30KLB24AN001	Fuel Building	Division 4[N] Division 3[A]	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Electrical Heater Two stage	30KLB21AH001A/B	Fuel Building	Division 1[N] Division 2[A]	Yes	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Electrical Heater Two stage	30KLB24AH001A/B	Fuel Building	Division 4[N] Division 3[A]	Yes	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Instruments							
Annulus Pressure	30KLB21CP001 30KLB24CP001	Fuel Building	N/A	Yes	N/A	Press / Press	N/A
Temperature Upstream of Heaters	30KLB21CT001 30KLB24CT001	Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A
Temperature Limit Switch for Heaters	30KLB21CT002 30KLB24CT002	Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A
Temperature Regulation for Heaters	30KLB21CT003 30KLB24CT003	Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A
Temperature downstream of carbon adsorbers	30KLB21CT004 30KLB24CT004	Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A
Pressure Limit Switch Exhaust Fans	30KLB21CP002 30KLB24CP002	Fuel Building	N/A	Yes	N/A	Press / Press	N/A

Table 2.6.6-1—Safeguard Building Controlled-Area Ventilation System Equipment Mechanical Design (6 Sheets)

Description	Tag Number (1)	Location	ASME AG-1 Code	Function	Seismic Category
Electric Heaters (Two stage)	30KLC41AH001A/B 30KLC42AH001A/B	30UFA 21082 30UFA 21084	Yes	On / Off (based on ambient conditions)	I
Pre filter/Moisture Separators	30KLC41AT001 30KLC42AT001	30UFA 21082 30UFA 21084	Yes	N/A	I
Upstream HEPA Filters	30KLC41AT002 30KLC42AT002	30UFA 21082 30UFA 21084	Yes	N/A	I
Carbon Absorbers	30KLC41AT003 30KLC42AT003	30UFA 21082 30UFA 21084	Yes	N/A	I
Downstream HEPA Filters	30KLC41AT004 30KLC42AT004	30UFA 21082 30UFA 21084	Yes	N/A	I
Motor Operated dampers	30KLC41AA002 30KLC42AA002	30UFA 21082 30UFA 21084	Yes	N/A	I
Exhaust Fans	30KLC41AN001 30KLC42AN001	30UFA 21083 30UFA 21081	Yes	Run	I
Backdraft dampers	30KLC41AA003 30KLC42AA003	30UFA 21083 30UFA 21081	Yes	N/A	I

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.6.6-2—Safeguard Building Controlled-Area Ventilation System Equipment I&C and Electrical Design (7 Sheets)

Description	Tag Number[(1)]	Location	IEEE Class 1E [(2)]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Electric Heater (two stage)	30KLC41AH001A/B	Fuel Building	Division 1[N] Division 2[A]	Yes	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30KLC41AA002	Fuel Building	Division 1[N] Division 2[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fan	30KLC41AN001	Fuel Building	Division 1[N] Division 2[A]	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Iodine Filtration Train 30KLC42							
Motor Operated Damper	30KLC42AA001	Fuel Building	Division 4[N] Division 3[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Electric Heater (two stage)	30KLC42AH001A/B	Fuel Building	Division 4[N] Division 3[A]	Yes	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30KLC42AA002	Fuel Building	Division 4[N] Division 3[A]	Yes	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fan	30KLC42AN001	Fuel Building	Division 4[N] Division 3[A]	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Cooling Units							
Recirculation Fans	30KLC51AN001 30KLC51AN002 30KLC51AN003	Safeguard Building 1 Safeguard Building 1 Safeguard Building 1	Division 1[N]	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fans	30KLC52AN001 30KLC52AN002	Safeguard Building 2 Safeguard Building 2	Division 2[N]	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fans	30KLC53AN001 30KLC53AN002	Safeguard Building 3 Safeguard Building 3	Division 3[N]	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop

Table 2.6.6-2—Safeguard Building Controlled-Area Ventilation System Equipment I&C and Electrical Design (7 Sheets)

Description	Tag Number[(1)]	Location	IEEE Class 1E [(2)]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Electric Heater (two stage)	30KLC41AH001A/B	Fuel Building	Division 1^N Division 2^A	Yes	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30KLC41AA002	Fuel Building	Division 1^N Division 2^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fan	30KLC41AN001	Fuel Building	Division 1^N Division 2^A	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Iodine Filtration Train 30KLC42							
Motor Operated Damper	30KLC42AA001	Fuel Building	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Electric Heater (two stage)	30KLC42AH001A/B	Fuel Building	Division 4^N Division 3^A	Yes	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor Operated Damper	30KLC42AA002	Fuel Building	Division 4^N Division 3^A	Yes	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fan	30KLC42AN001	Fuel Building	Division 4^N Division 3^A	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Cooling Units							
Recirculation Fans	30KLC51AN001 30KLC51AN002 30KLC51AN003	Safeguard Building 1 Safeguard Building 1 Safeguard Building 1	Division 1^N	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fans	30KLC52AN001 30KLC52AN002	Safeguard Building 2 Safeguard Building 2	Division 2^N	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Recirculation Fans	30KLC53AN001 30KLC53AN002	Safeguard Building 3 Safeguard Building 3	Division 3^N	Yes	Yes	On-Off / On-Off	Run-Stop / Run-Stop

Table 2.6.6-2—Safeguard Building Controlled-Area Ventilation System Equipment I&C and Electrical Design (7 Sheets)

Description	Tag Number[1]	Location	IEEE Class 1E [2]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
CCW & EFW Valve Room Temperature	30KLC51CT005 30KLC51CT006 30KLC52CT005 30KLC52CT006 30KLC53CT005 30KLC53CT006 30KLC54CT005 30KLC54CT006	Safeguard Building 1 Safeguard Building 1 Safeguard Building 2 Safeguard Building 2 Safeguard Building 3 Safeguard Building 3 Safeguard Building 4 Safeguard Building 4	N/A	Yes	N/A	Temp / Temp	N/A
Sampling System Room Temperature	30KLC51CT007 30KLC51CT008 30KLC54CT007 30KLC54CT008	Safeguard Building 1 Safeguard Building 1 Safeguard Building 4 Safeguard Building 4	N/A	Yes	N/A	Temp / Temp	N/A
Temperature Downstream of Iodine Filtration Heater	30KLC~~B~~41CT001/002 30KLC~~B~~42CT001/002	Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A
Temperature Downstream of Carbon Adsorbers	30KLC~~B~~41CT003 30KLC~~B~~42CT003	Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.6.6-2—Safeguard Building Controlled-Area Ventilation System Equipment I&C and Electrical Design (7 Sheets)

Description	Tag Number(1)	Location	IEEE Class 1E (2)	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Differential Pressure across Iodine Filtration Trains	30KLC~~B~~41CP001 30KLC~~B~~42CP001	Fuel Building	N/A	Yes	N/A	Press / Press ~~Temp / Temp~~	N/A
Temperature Upstream of Iodine Filtration Trains	30KLC41CT004 30KLC42CT004	Fuel Building	N/A	Yes	N/A	Temp / Temp	N/A

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

2) ^{N} denotes division the component is normally powered from, while ^{A} denotes division the component is powered from when alternate feed is implemented.

Table 2.6.7-2—Electrical Division of Safeguard Building Ventilation System Equipment I&C and Electrical Design (9 Sheets)

Description	Tag Number[1]	Location	IEEE Class 1E [2]	PACS	MCR / RSS Displays	MCR / RSS Controls
Battery Room Exhaust Air Flow	30SAC41CF001	Safeguard Building 1	Division 1	N/A	Flow/ Flow	N/A
Battery Room Exhaust Air Flow	30SAC44CF001	Safeguard Building 4	Division 4	N/A	Flow/ Flow	N/A
Outside Air Temperature Sensors	30SAC01CT001/002 30SAC02CT001/002 30SAC03CT001/002 30SAC04CT001/002	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	N/A	N/A	Temp / Temp	N/A
Temperature Sensors Upstream of heaters	30SAC01CT501 30SAC02CT501 30SAC03CT501 30SAC04CT501	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	N/A	N/A	Temp / Temp	N/A
Protective Switch-off Temperature for heaters	30SAC01CT003 30SAC02CT003 30SAC03CT003 30SAC04CT003	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	N/A	N/A	Temp / Temp	N/A
Temperature Sensors Downstream of heaters	30SAC01CT004/005 30SAC02CT004/005 30SAC03CT004/005 30SAC04CT004/005	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	N/A	N/A	Temp / Temp	N/A
Temperature Sensors Downstream of Moisture Separators	30SAC01CT502 30SAC02CT502 30SAC03CT502 30SAC04CT502	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	N/A	N/A	Temp / Temp	N/A

Table 2.6.7-2—Electrical Division of Safeguard Building Ventilation System Equipment I&C and Electrical Design (9 Sheets)

Description	Tag Number[(1)]	Location	IEEE Class 1E [(2)]	PACS	MCR / RSS Displays	MCR / RSS Controls
Supply Air Temperature Sensors	30SAC01CT006 30SAC02CT006 30SAC03CT006 30SAC04CT006	Safeguard Building 1 Safeguard Building 2 Safeguard Building 3 Safeguard Building 4	N/A	N/A	Temp / Temp	N/A

1) Equipment tag numbers are provided for information only and are not part of the certified design. N denotes division the component is normally powered from, while A denotes the component is powered from when alternate feed is implemented.

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.6.8-3—Containment Building Ventilation System Equipment I&C and Electrical Design (4 Sheets)

Description	Tag Number [1]	Location	IEEE Class 1E [2]	EQ – Harsh Env.	PACS	MCR / RSS Displays	MCR / RSS Controls
Temperature Downstream of Electric Heater	30KLA22CT001	Fuel Building	N/A	Yes	N/A	Temperature/ Temperature	N/A
Temperature Upstream of Electric Heater	30KLA22CT002	Fuel Building	N/A	Yes	N/A	Temperature/ Temperature	N/A
Duct Air Flow	30KLA22CF001	Fuel Building	N/A	Yes	N/A	Flow/Flow	N/A
Iodine Filter Differential Pressure	30KLA22CP505	Fuel Building	N/A	Yes	N/A	N/A	N/A
Temperature Downstream of Carbon Adsorbers	30KLA21CT003	Fuel Building	N/A	Yes	N/A	Temperature/ Temperature	N/A
Temperature Downstream of Carbon Adsorbers	30KLA22CT003	Fuel Building	N/A	Yes	N/A	Temperature/ Temperature	N/A
Temperature Upstream of Electric Heater	30KLA50CT002	Reactor Building	N/A	Yes	N/A	Temperature / Temperature	N/A
Temperature Downstream of Electric Heater	30KLA50CT001	Reactor Building	N/A	Yes	N/A	Temperature / Temperature	N/A
Duct Air Flow	30KLA50CF001	Reactor Building	N/A	Yes	N/A	Flow/Flow	N/A
Temperature Downstream of Carbon Adsorber	30KLA50CT003	Reactor Building	N/A	Yes	N/A	Temperature / Temperature	N/A

2.6.9 Emergency Power Generating Building Ventilation System

1.0 Description

The emergency power generating building ventilation system (EPGBVS) controls the temperature~~, humidity~~ and air change rate in the Emergency Power Generating Buildings (EPGB) for personnel comfort, personnel safety, and equipment protection~~ during operation of the emergency diesel generators (EDG)~~. The EPGBVS provides ventilation of the diesel hall, electrical room, and main tank room; and cooling of the electrical room for each of the four divisions of the EPGBs to remove equipment heat, and heat generated from other sources. The EPGBVS also provides heat to maintain a minimum temperature in the buildings.

Each division of the EPGBs has its own independent heating, ventilation and air conditioning system which is not connected to other divisions. Two divisions are located in each of the two EPGBs. EPGBVS Divisions 1 and 2 are located in EPGB 1/2 and Divisions 3 and 4 in EPGB 3/4. During normal plant operation, the emergency diesel generators (EDG~~s~~) do not operate, however the EPGBVS maintains an acceptable ambient temperature for the startup of EDGs and for personnel comfort.

The EPGBVS provides the following safety-related functions:

- Removes heat generated by the EDGs during operation of the EDGs to maintain acceptable operating conditions in the diesel hall.
- Maintains acceptable ambient conditions in the electrical room and main tank room.
- Maintains environmental conditions for startup of the EDGs.

The EPGBVS provides the following non-safety-related functions:

- Maintains the room ambient conditions to allow personnel access during normal operation.
- Provides ventilation to maintain required air renewal rates.

2.0 Arrangement

2.1 The functional arrangement of the EPGBVS is as shown in the following figures:

- Figure 2.6.9-1—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 1.
- Figure 2.6.9-2—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 2.
- Figure 2.6.9-3—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 3.

- Figure 2.6.9-4—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 4.

2.2 The location of the EPGBVS equipment is as listed in Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design.

2.3 Physical separation exists between ~~the four~~ divisions of the EPGBVS as listed in Table 2.6.9-1.

3.0 Mechanical Design Features

3.1 Deleted.

3.2 Class 1E dampers ~~Equipment~~ listed in Table 2.6.9-1 will ~~can perform the~~ function to change position as listed in Table 2.6.9-1 under system operating conditions.

3.3 Components identified as Seismic Category I in Table 2.6.9-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.6.9-1.

3.4 Components listed in Table 2.6.9-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.

3.5 Components listed in Table 2.6.9-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.

3.6 Components listed in Table 2.6.9-1 as ASME AG-1 Code are installed, inspected and tested in accordance with ASME AG-1 Code requirements.

4.0 Displays and Controls

4.1 Displays listed in Table 2.6.9-2—Emergency Power Generating Building Ventilation System Equipment I&C and Electrical Design, are ~~retrievable~~ indicated in the main control room (MCR) and the remote shutdown station (RSS) ~~as listed in Table 2.6.9-2~~.

4.2 Controls on the PICS in the MCR and the RSS perform the function~~The EPGBVS equipment controls are provided in the MCR and RSS as~~ listed in Table 2.6.9-2.

4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.6.9-2 responds to the state requested ~~by a test signal~~ and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

5.0 Electrical Power Design Features

5.1 The equipment designated as Class 1E in Table 2.6.9-2 are powered from the Class 1E division as listed in Table 2.6.9-2 in a normal feed condition.

5.2 Deleted.~~Motor operated dampers listed in Table 2.6.9-2 fail to the position as shown in Table 2.6.9-2 on loss of power.~~

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (7 Sheets)

Description	Tag Number [1]	Location	ASME AG-1 Code	Function	Seismic Category
Backdraft Dampers	30SAD11AA003 30SAD21AA003 30SAD31AA003 30SAD41AA003	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Pre-filters	30SAD11AT003 30SAD21AT003 30SAD31AT003 30SAD41AT003	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Supply Air Fans	30SAD11AN003 30SAD21AN003 30SAD31AN003 30SAD41AN003	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Motor operated dampers	30SAD11AA004 30SAD21AA004 30SAD31AA004 30SAD41AA004	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	I
Diesel Hall Air Supply and Exhaust					
Manual Dampers	30SAD12AA001 30SAD22AA001 30SAD32AA001 30SAD42AA001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
Manual Dampers	30SAD12AA002 30SAD22AA002 30SAD32AA002 30SAD42AA002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (7 Sheets)

Description	Tag Number [1]	Location	ASME AG-1 Code	Function	Seismic Category
Back Draft Dampers	30SAD15AA002 30SAD25AA002 30SAD35AA002 30SAD45AA002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
Motor operated dampers	30SAD15AA004 30SAD25AA004 30SAD35AA004 30SAD45AA004	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	I
Exhaust Fans	30SAD15AN003 30SAD25AN003 30SAD35AN003 30SAD45AN003	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Backdraft Dampers	30SAD15AA003 30SAD25AA003 30SAD35AA003 30SAD45AA003	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Electrical Room Air Supply and Recirculation					
~~Motor operated dampers~~	~~30SAD13AA001~~ ~~30SAD23AA001~~ ~~30SAD33AA001~~ ~~30SAD43AA001~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4 EPGB, Division 4~~	~~Yes~~	~~Open~~	~~I~~
Manual dampers	30SAD13AA002 30SAD23AA002 30SAD33AA002 30SAD43AA002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (7 Sheets)

Description	Tag Number (1)	Location	ASME AG-1 Code	Function	Seismic Category
Pre-filters	30SAD13AT001 30SAD23AT001 30SAD33AT001 30SAD43AT001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
HEPA Filters	30SAD13AT002 30SAD23AT002 30SAD33AT002 30SAD43AT002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
Cooling Coils	30SAD13AC001 30SAD23AC001 30SAD33AC001 30SAD43AC001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
Moisture Separators	30SAD13AT003 30SAD23AT003 30SAD33AT003 30SAD43AT003	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I
~~Electric Heaters~~	~~30SAD13AH001~~ ~~30SAD23AH001~~ ~~30SAD33AH001~~ ~~30SAD43AH001~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4 EPGB, Division 4~~	~~Yes~~	~~On / Off~~	~~I~~
Supply Air Fans	30SAD13AN001 30SAD23AN001 30SAD33AN001 30SAD43AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	Run	I

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (7 Sheets)

Description	Tag Number [1]	Location	ASME AG-1 Code	Function	Seismic Category
~~Humidifiers~~	~~30SAD13AH002~~ ~~30SAD23AH002~~ ~~30SAD33AH002~~ ~~30SAD43AH002~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4 EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~II~~
~~Back Draft Dampers~~	~~30SAD13AA003~~ ~~30SAD23AA003~~ ~~30SAD33AA003~~ ~~30SAD43AA003~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4 EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~I~~
~~Back Draft Dampers~~	~~30SAD13AA006~~ ~~30SAD23AA006~~ ~~30SAD33AA006~~ ~~30SAD43AA006~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4 EPGB, Division 4~~	~~Yes~~	~~N/A~~	~~I~~
Motor operated dampers	30SAD13AA007 30SAD23AA007 30SAD33AA007 30SAD43AA007	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	I
Manual Dampers	30SAD13AA008 30SAD23AA008 30SAD33AA008 30SAD43AA008	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Manual Dampers	30SAD13AA009 30SAD23AA009 30SAD33AA009 30SAD43AA009	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II

Table 2.6.9-1—Emergency Power Generating Building Ventilation System Equipment Mechanical Design (7 Sheets)

Description	Tag Number [1]	Location	ASME AG-1 Code	Function	Seismic Category
Pre-filters	30SAD13AT003 30SAD23AT003 30SAD33AT003 30SAD43AT003	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Cooling Coils	30SAD13AC002 30SAD23AC002 30SAD33AC002 30SAD43AC002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Cooling Coils	30SAD13AC102 30SAD23AC102 30SAD33AC102 30SAD43AC102	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Supply Air Fans	30SAD13AN002 30SAD23AN002 30SAD33AN002 30SAD43AN002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	II
Backdraft dampers	30SAD13AA010 30SAD23AA010 30SAD33AA010 30SAD43AA010	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Yes	N/A	I
Main Tank Room Air Supply and Exhaust					
Back Draft Dampers	30SAD16AA001 30SAD26AA001 30SAD36AA001 30SAD46AA001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Yes	N/A	I

Table 2.6.9-2—Emergency Power Generating Building Ventilation System Equipment I&C and Electrical Design (3 Sheets)

Description	Tag Number (1)	Location	IEEE Class 1E	~~Failure Position~~	PACS	MCR / RSS Displays	MCR / RSS Controls
Supply Air Fans	30SAD11AN001 30SAD21AN001 30SAD31AN001 30SAD41AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	~~N/A~~	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Supply Air Fans	30SAD11AN002 30SAD21AN002 30SAD31AN002 30SAD41AN002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	~~N/A~~	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Exhaust Fans	30SAD15AN001 30SAD25AN001 30SAD35AN001 30SAD45AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	~~N/A~~	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Exhaust Fans	30SAD15AN002 30SAD25AN002 30SAD35AN002 30SAD45AN002	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	~~N/A~~	Yes	On-Off / On-Off	Run-Stop / Run-Stop
~~Motor Operated Dampers~~	~~30SAD13AA001~~ ~~30SAD23AA001~~ ~~30SAD33AA001~~ ~~30SAD43AA001~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4 EPGB, Division 4~~	~~Division 1~~ ~~Division 2~~ ~~Division 3~~ ~~Division 4~~	Close	~~Yes~~	~~Position / Position~~	~~Open-Close / Open-Close~~
~~Electric Heaters~~	~~30SAD13AH001~~ ~~30SAD23AH001~~ ~~30SAD33AH001~~ ~~30SAD43AH001~~	~~1/2 EPGB, Division 1~~ ~~1/2 EPGB, Division 2~~ ~~3/4 EPGB, Division 3~~ ~~3/4 EPGB, Division 4~~	~~Division 1~~ ~~Division 2~~ ~~Division 3~~ ~~Division 4~~	N/A	~~Yes~~	~~On-Off / On-Off~~	~~Start-Stop / Start-Stop~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.6.9-2—Emergency Power Generating Building Ventilation System Equipment I&C and Electrical Design (3 Sheets)

Description	Tag Number (1)	Location	IEEE Class 1E	~~Failure Position~~	PACS	MCR / RSS Displays	MCR / RSS Controls
Supply Air Fans	30SAD13AN001 30SAD23AN001 30SAD33AN001 30SAD43AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	~~N/A~~	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Motor Operated Dampers	30SAD16AA007 30SAD26AA007 30SAD36AA007 30SAD46AA007	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	~~Close~~	Yes	Position / Position	Open-Close / Open-Close
Motor Operated Dampers	30SAD16AA008 30SAD26AA008 30SAD36AA008 30SAD46AA008	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	~~Close~~	Yes	Position / Position	Open-Close / Open-Close
Exhaust Fans	30SAD16AN001 30SAD26AN001 30SAD36AN001 30SAD46AN001	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4 EPGB, Division 4	Division 1 Division 2 Division 3 Division 4	~~N/A~~	Yes	On-Off / On-Off	Run-Stop / Run-Stop
Fan Heaters	30SAD14AH001 30SAD14AH002 30SAD14AH003 30SAD14AH004	1/2 EPGB, Division 1	Division 1	~~N/A~~	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Fan Heaters	30SAD24AH001 30SAD24AH002 30SAD24AH003 30SAD24AH004	1/2 EPGB, Division 2	Division 2	~~N/A~~	Yes	On-Off / On-Off	Start-Stop / Start-Stop

Table 2.6.9-2—Emergency Power Generating Building Ventilation System Equipment I&C and Electrical Design (3 Sheets)

Description	Tag Number [1]	Location	IEEE Class 1E	~~Failure Position~~	PACS	MCR / RSS Displays	MCR / RSS Controls
Fan Heaters	30SAD34AH001 30SAD34AH002 30SAD34AH003 30SAD34AH004	3/4 EPGB, Division 3	Division 3	~~N/A~~	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Fan Heaters	30SAD44AH001 30SAD44AH002 30SAD44AH003 30SAD44AH004	3/4 EPGB, Division 4	Division 4	~~N/A~~	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Motor operated dampers	30SAD11AA004 30SAD21AA004 30SAD31AA004 30SAD41AA004	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Division 1 Division 2 Division 3 Division 4		Yes	Position / Position	Open-Close / Open-Close
Motor operated dampers	30SAD15AA004 30SAD25AA004 30SAD35AA004 30SAD45AA004	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Division 1 Division 2 Division 3 Division 4		Yes	Position / Position	Open-Close / Open-Close
Motor operated dampers	30SAD13AA007 30SAD23AA007 30SAD33AA007 30SAD43AA007	1/2 EPGB, Division 1 1/2 EPGB, Division 2 3/4 EPGB, Division 3 3/4EPGB, Division 4	Division 1 Division 2 Division 3 Division 4		Yes	Position / Position	Open-Close / Open-Close

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

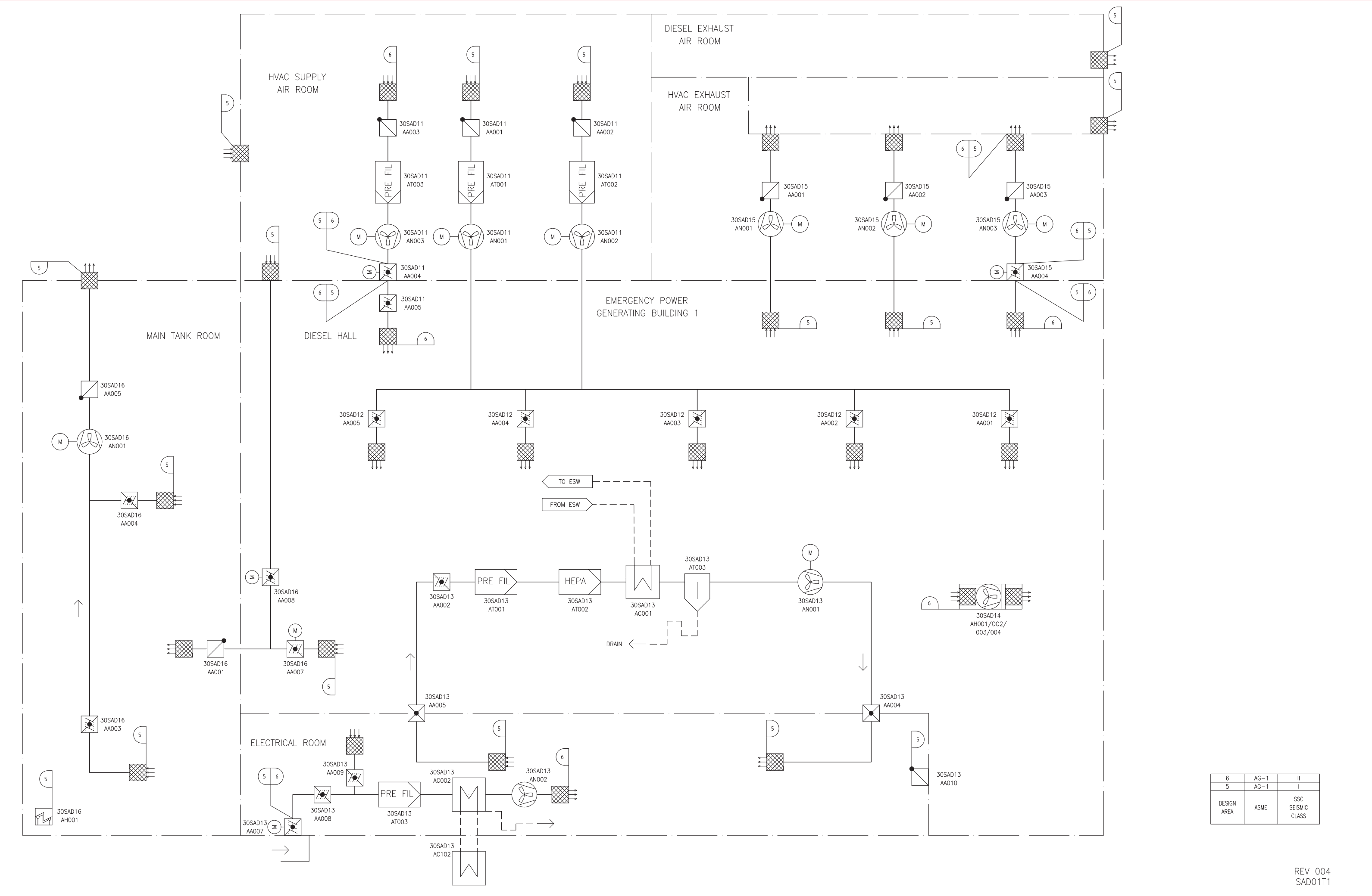
Table 2.6.9-3—Emergency Power Generating Building Ventilation System ITAAC (3 Sheets)

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
5.2	Deleted.~~Motor operated dampers listed in Table 2.6.9-2 fail to the position as shown in Table 2.6.9-2 on loss of power.~~	~~Tests Testing will be performed for the motor operated dampers listed in Table 2.6.9-2 to verify the position of dampers on loss of power.~~	~~Following loss of power, the motor operated dampers listed in Table 2.6.9-2 fail to the position as shown in Table 2.6.9-2.~~
6.1	The EPGBVS provides ventilation and cooling to maintain design temperatures in the Emergency Power Generating Buildings, while operating in a design basis accident alignment.	a. An ~~inspection of the manufacturer's documentation of the EPGBVS cooling coils~~ analysis will be performed. b. Tests and analysis of the EPGBVS units will be performed~~to verify that design temperatures in the Emergency Power Generating Buildings, while operating in a design basis accident alignment~~.	a. ~~A report confirms that each~~Each EPGBVS cooling coil is capable of providing design cooling requirements. b. ~~A report confirms that the~~The EPGBVS is capable of providing ventilation and cooling to maintain design temperatures in the Emergency Power Generating Buildings, while operating in a design basis accident alignment. • ~~A report confirms that each~~Each EPGBVS fan is capable of meeting the design air flow requirements, while operating in a design basis accident alignment.

Next File

All indicated changes are in response to RAI 505, Question 07.01-35

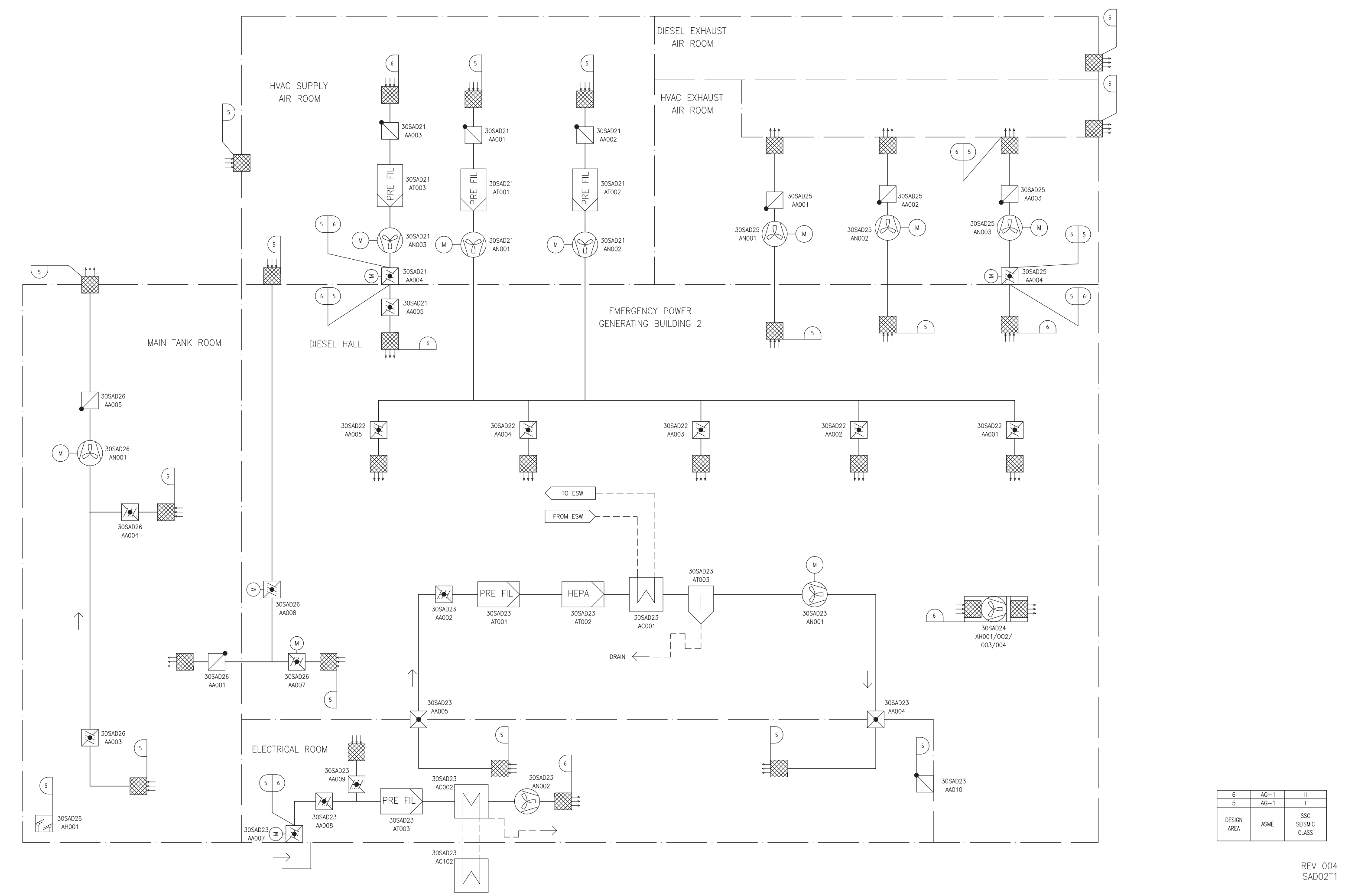
Figure 2.6.9-1—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 1



6	AG-1	II
5	AG-1	I
DESIGN AREA	ASME	SSC SEISMIC CLASS

All indicated changes are in response to RAI 505, Question 07.01-35

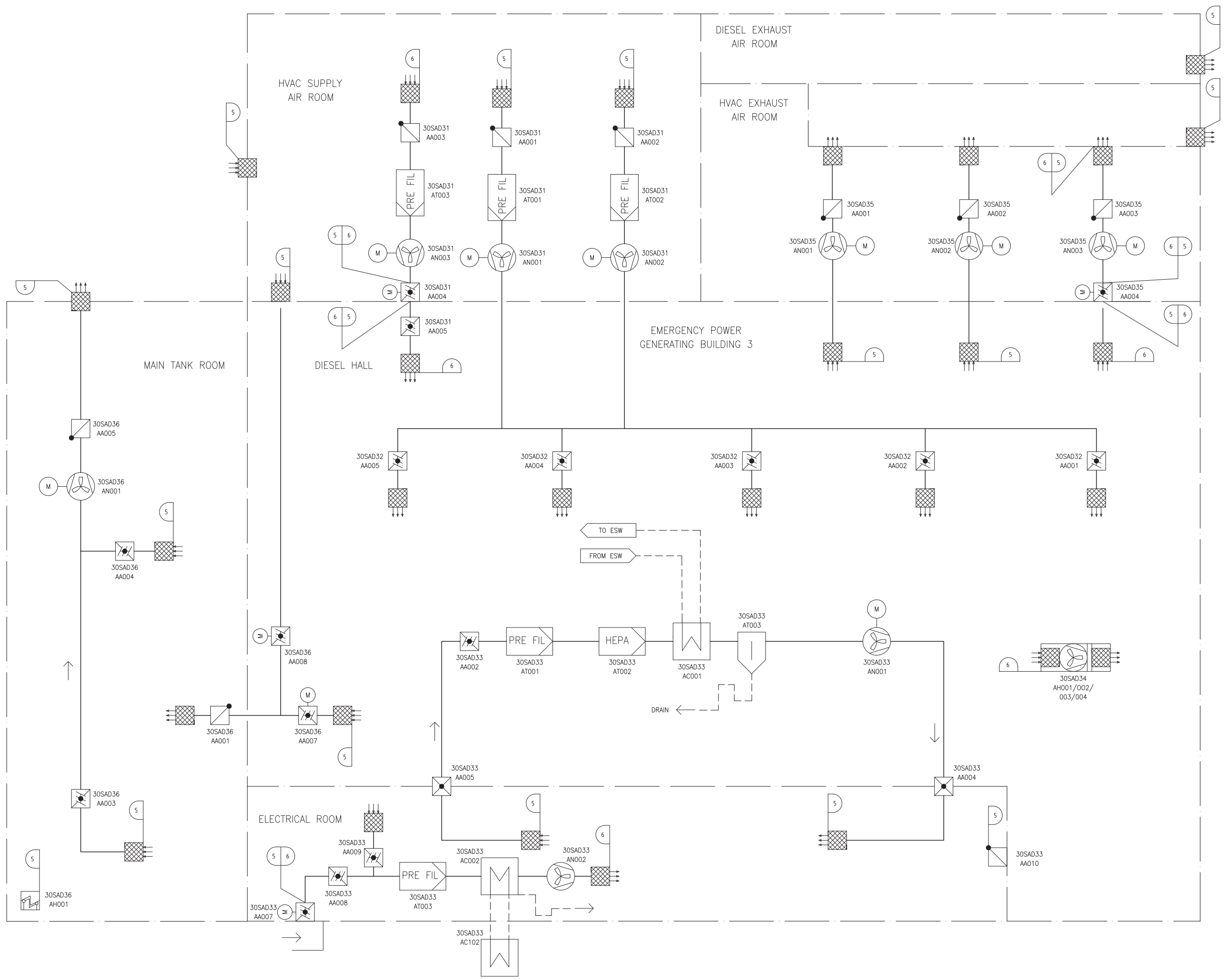
Figure 2.6.9-2—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 2



6	AG-1	II
5	AG-1	I
DESIGN AREA	ASME	SSC SEISMIC CLASS

All indicated changes are in response to RAI 505, Question 07.01-35

Figure 2.6.9-3—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 3

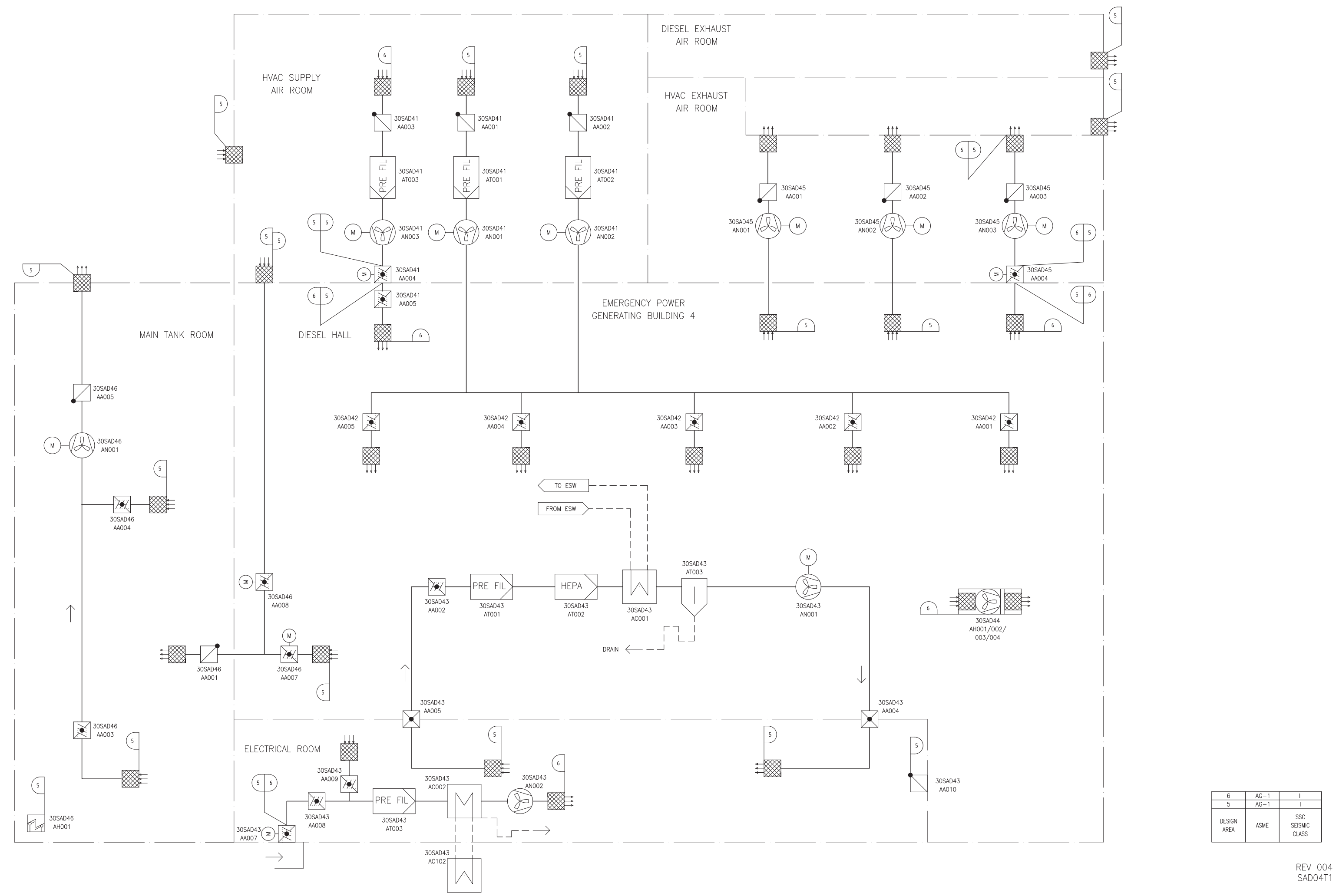


6	AG-1	II
5	AG-1	I
DESIGN AREA	ASME	SSC SEISMIC CLASS

REV 004
SAD03T1

All indicated changes are in response to RAI 505, Question 07.01-35

Figure 2.6.9-4—Emergency Power Generating Building Ventilation System Functional Arrangement, Division 4



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2.6.13 Essential Service Water Pump Building Ventilation System

1.0 Description

The essential service water pump building ventilation system (ESWPBVS) controls the temperature and air change rate in the essential service water system (ESWS) pump areas for personnel comfort, personnel safety, and equipment protection. ~~during operation of ESWS pumps.~~ The ESWPBVS provides cooling and heating for the ESWS pump area and associated electrical equipment in each of the four ESWS Pump Buildings (ESWPB) to remove equipment heat, and heat generated from other sources. Each building has its own independent ventilation system and is not connected to the other buildings.

The ESWPBVS provides the following safety-related functions:

- Removes heat generated by the ESWS pumps and associated electrical equipment.
- Maintains acceptable temperature limits to support operation of ESWS pumps.

The ESWPBVS provides the following non-safety-related functions:

- Maintains the room ambient conditions to allow personnel access during normal operation.
- Provides ventilation ~~by recirculation of room air only (without outside air)~~ and cooling during plant operation when an ESW pump is not operating.

2.0 Arrangement

2.1 The functional arrangement of the ESWPBVS is as shown in Figure 2.6.13-1—Essential Service Water Pump Building Ventilation System Functional Arrangement.

2.2 The location of the ESWPBVS equipment is as listed in Table 2.6.13-1—Essential Service Water Pump Building Ventilation System Equipment Mechanical Design.

2.3 Physical separation exists between ~~the four~~ divisions of the ESWPBVS as shown in Table 2.6.13-1.

3.0 Mechanical Design Features

3.1 Deleted.

3.2 Class 1E dampers ~~Equipment~~ listed in Table 2.6.13-1 will ~~can perform the~~ function to change position as listed in Table 2.6.13-1 under system operating conditions.

3.3 Components identified as Seismic Category I in Table 2.6.13-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.6.13-1.

3.4 Components listed in Table 2.6.13-1 as ASME AG-1 Code are designed in accordance with ASME AG-1 Code requirements.

3.5 Components listed in Table 2.6.13-1 as ASME AG-1 Code are fabricated in accordance with ASME AG-1 Code requirements, including welding requirements.

3.6 Components listed in Table 2.6.13-1 as ASME AG-1 Code are installed, inspected and tested in accordance with ASME AG-1 Code requirements.

4.0 Displays and Controls

4.1 Displays listed in Table 2.6.13-2—Essential Service Water Pump Building Ventilation System Equipment I&C and Electrical Design, are ~~retrievable~~ indicated in the main control room (MCR) and the remote shutdown station (RSS) ~~as listed in Table 2.6.13-2~~.

4.2 Controls on the PICS in the MCR and the RSS perform the function ~~The ESWPBVS equipment controls are provided in the MCR and RSS as~~ listed in Table 2.6.13-2.

4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.6.13-2 responds to the state requested ~~by a test signal~~ and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

5.0 Electrical Power Design Features

5.1 The equipment designated as Class 1E in Table 2.6.13-2 are powered from the Class 1E division as listed in Table 2.6.13-2 in a normal feed condition.

6.0 Equipment and System Performance

6.1 The safety-related ESWPBVS provides ~~recirculation~~ cooling to maintain design temperatures in the Essential Service Water Pump Buildings, while operating in a design basis accident alignment.

7.0 Inspections, Tests, Analyses and Acceptance Criteria

Table 2.6.13-3 lists the ESWPBVS ITAAC.

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.6.13-1—Essential Service Water Pump Building Ventilation System Equipment Mechanical Design (2 Sheets)

Description	Tag Number [(1)]	Location	ASME AG-1 Code	Function	Seismic Category
Air Cooling Coils	30SAQ01AC001 30SAQ02AC001 30SAQ03AC001 30SAQ04AC001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I
Moisture Separators	30SAQ01AT001 30SAQ02AT001 30SAQ03AT001 30SAQ04AT001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I
Electrical Heaters	30SAQ01AH001/002 30SAQ02AH001/002 30SAQ03AH001/002 30SAQ04AH001/002	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	On / Off (based on ambient conditions)	I
Recirculation Fans	30SAQ01AN001 30SAQ02AN001 30SAQ03AN001 30SAQ04AN001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	Run	I
~~Manual~~ Motor Operated Outside Air Isolation Dampers	30SAQ01AA007~~1~~ 30SAQ02AA007~~1~~ 30SAQ03AA007~~1~~ 30SAQ04AA007~~1~~	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I
Manual ~~Isolation~~ Balancing Dampers	30SAQ01AA002 30SAQ02AA002 30SAQ03AA002 30SAQ04AA002	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I

All indicated changes are in response to RAI 505, Question 07.01-35

PreFilter	30SAQ01AT002 30SAQ02AT002 30SAQ03AT002 30SAQ04AT002	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Yes	N/A	I

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

All indicated changes are in response to RAI 505, Question 07.01-35

Table 2.6.13-2—Essential Service Water Pump Building Ventilation System Equipment I&C and Electrical Design

Description	Tag Number [1]	Location	IEEE Class 1E	PACS	MCR / RSS Displays	MCR / RSS Controls
Electrical Heaters	30SAQ01AH001/002 30SAQ02AH001/002 30SAQ03AH001/002 30SAQ04AH001/002	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	Start-Stop / Start-Stop
Recirculation Fans	30SAQ01AN001 30SAQ02AN001 30SAQ03AN001 30SAQ04AN001	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	Yes	On-Off / On-Off	Run-Stop / Run-Stop
~~Temperature Sensors~~	~~30SAQ01CT001~~ ~~30SAQ02CT001~~ ~~30SAQ03CT001~~ ~~30SAQ04CT001~~	~~ESW Pump Building 1~~ ~~ESW Pump Building 2~~ ~~ESW Pump Building 3~~ ~~ESW Pump Building 4~~	~~Division 1~~ ~~Division 2~~ ~~Division 3~~ ~~Division 4~~	~~N/A~~	~~Temp / Temp~~	~~N/A~~
Motor Operated Outside Air Isolation Dampers	30SAQ01AA005/007 30SAQ02AA005/007 30SAQ03AA005/007 30SAQ04AA005/007	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	Yes	Position/Position	Open-Close/ Open-Close
Temperature Sensors—Elec Heaters	30SAQ01CT002/003 30SAQ02CT002/003 30SAQ03CT002/003 30SAQ04CT002/003	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	Yes	Temperature/ Temperature	N/A
Temperature Sensors—M.O. Outside Air Isol Dampers	30SAQ01CT004 30SAQ02CT004 30SAQ03CT004 30SAQ04CT004	ESW Pump Building 1 ESW Pump Building 2 ESW Pump Building 3 ESW Pump Building 4	Division 1 Division 2 Division 3 Division 4	Yes	N/A	N/A

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

Table 2.6.13-3—Essential Service Water Pump Building Ventilation System ITAAC (3 Sheets)

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
6.1	The safety-related ESWPBVS provides ~~recirculation~~ cooling to maintain design temperatures in the Essential Service Water Pump Buildings, while operating in a design basis accident alignment.	a. An ~~inspection of the manufacturer's documentation of the ESWPBVS cooling coils~~ analysis will be performed. b. Tests and analysis of the ESWPBVS safety-related cooling units will be performed. ~~to verify that design temperatures in the hot mechanical rooms in the Essential Service Water Pump Buildings, while operating in a design basis accident alignment.~~	a. ~~A report confirms that each~~Each ESWPBVS safety-related cooling coil is capable of providing design cooling requirements. b. ~~A report confirms that the~~The safety-related ESWPBVS is capable of providing cooling to maintain design temperatures in the ~~hot mechanical rooms in the~~ Essential Service Water Pump Buildings, while operating in a design basis accident alignment. ~~A report confirms that each~~Each ESWPBVS safety-related fan is capable of meeting the design air flow requirements, while operating in a design basis accident alignment.

Next File

Figure 2.6.13-1—Essential Service Water Pump Building Ventilation System Functional Arrangement

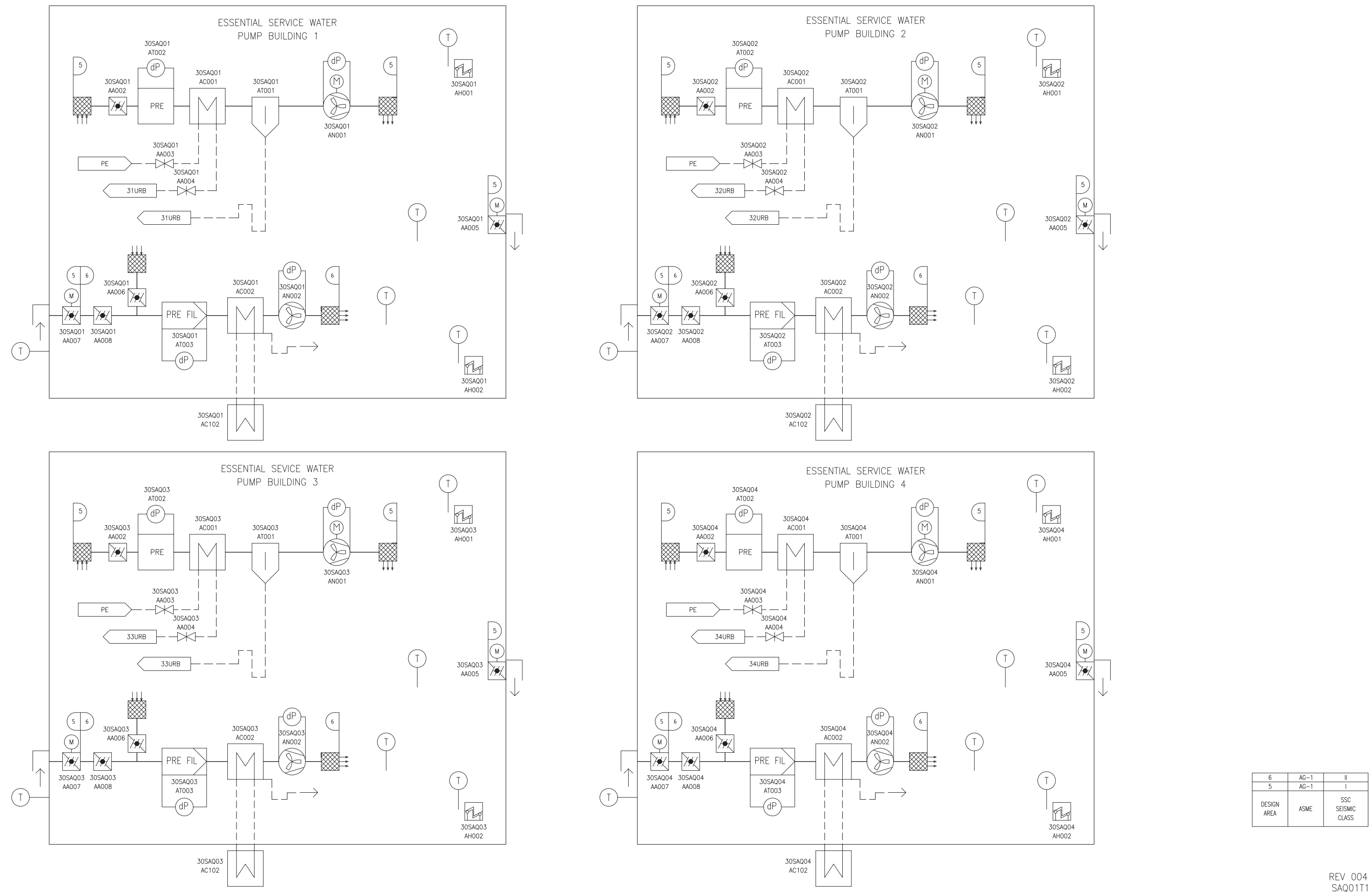

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Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAC05/08 AH002	Electric Heaters - Maintenance Train Supply Air	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC01/02/03/04 AH002	Electric Heaters - Supply Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC51/52/53/54 AN001	Exhaust Air Fans - Battery/SCWS Room Exhaust	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC51/54 AN002	Exhaust Air Fans - Maintenance Train Battery/SCWS Room Exhaust	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC35/38 AN001	Exhaust Fan - Maintenance Train Exhaust Air	NS	N/A	NSC	No	1UJK, 4UJK	
30SAC31/32/33/35 AN001	Exhaust Fans - Exhaust Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
~~30SAC01/02/03/04 AH003/004~~	~~Humidifier Heaters—Supply Air System~~	~~S~~	~~N/A~~	~~I~~	~~Yes~~	~~UJK~~	~~ASME AG-1[14]~~
~~30SAC05/08 AC003/004~~	~~Humidifier Spray Nozzles—Maintenance Train Supply Air~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~1UJK, 4UJK~~	

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
~~30SAC01/02/03/04 AT007/008~~	~~Humidifier Spray Nozzles - Supply Air System~~	~~S~~	~~N/A~~	~~I~~	~~Yes~~	~~UJK~~	~~ASME AG-1[14]~~
~~30SAC05/08 AH003/ 004~~	~~Humidifiers Heaters - Maintenance Train Supply Air~~	~~NS~~	~~N/A~~	~~NSC~~	~~No~~	~~1UJK, 4UJK~~	
SAC	Maintenance Supply/ Exhaust Ducts	NS	N/A	NSC	No	UJK	
30SAC35/38 AA001/ 004	Manual Isolation Damper - Maintenance Train Exhaust Air	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]
30SAC51/52/53/54 AA001	Manual Isolation Dampers - Battery/ SCWS Room Exhaust	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC31/32/33/35 AA001/004	Manual Isolation Dampers - Exhaust Air System	S	N/A	I	Yes	UJK	ASME AG-1[14]
30SAC51/54 AA004	Manual Isolation Dampers - Maintenance Train Battery/SCWS Room Exhaust	S	N/A	I	Yes	1UJK, 4UJK	ASME AG-1[14]

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KLC51/52/53/54 AN002	Recirculation Fans	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC51/54 AN003	Recirculation Fans	S	N/A	I	Yes	UJH	ASME AG-1[14]
30KLC12 AH001	Room Heater	NS	N/A	NSC	No	UJH	
30KLC11/14 AH001/ 002	Room Heaters	NS	N/A	NSC	No	UJH	
30KLC12/13 AH002-006	Room Heaters	NS	N/A	NSC	No	UJH	
~~**SAD**~~	~~**Emergency Power Generating Building Ventilation System**~~	~~S~~	~~N/A~~	~~I~~	~~Yes~~	~~UBP~~	~~ASME AG-1[14]~~
~~**SAQ**~~	~~**Essential Service Water Pump Building Ventilation System**~~	~~S~~	~~N/A~~	~~I~~	~~Yes~~	~~URB~~	~~ASME AG-1[14]~~
SAD	**Emergency Power Generating Building Ventilation System**						
30SAD11/21/31/41-AA001/AA002	Back Draft Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD11/21/31/41-AA003	Back Draft Dampers	NS-AQ	N/A	II	Yes	UBP	ASME AG-1[14]

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAD15/25/35/45-AA001/AA002	Back Draft Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD15/25/35/45-AA003	Back Draft Dampers	NS-AQ	N/A	II	Yes	UBP	ASME AG-1[14]
30SAD13/23/33/43-AA010	Back Draft Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD16/26/36/46-AA001/AA005	Back Draft Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD11/21/31/41-AT001/AT002	Pre-filters	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD11/21/31/41-AT003	Pre-filters	NS-AQ	N/A	II	Yes	UBP	ASME AG-1[14]
30SAD13/23/33/43-AT001	Pre-filters	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD13/23/33/43-AT003	Pre-filters	NS-AQ	N/A	II	Yes	UBP	ASME AG-1[14]
30SAD11/21/31/41-AN001/AN002	Supply Air Fans	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD11/21/31/41-AN003	Supply Air Fans	NS-AQ	N/A	II	Yes	UBP	ASME AG-1[14]
30SAD13/23/33/43-AN001	Supply Air Fans	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD13/23/33/43-AN002	Supply Air Fans	NS-AQ	N/A	II	Yes	UBP	ASME AG-1[14]

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAD11/21/31/41-AA004	Motor Operated Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD15/25/35/45-AA004	Motor Operated Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD13/23/33/43-AA007	Motor Operated Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD16/26/36/46-AA007/AA008	Motor Operated Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD11/21/31/41-AA005	Manual Dampers	NS-AQ	N/A	II	Yes	UBP	ASME AG-1[14]
30SAD12/22/32/42-AA001/AA002/AA003/AA004/AA005	Manual Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD13/23/33/43-AA002	Manual Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD13/23/33/43-AA008/AA009	Manual Dampers	NS-AQ	N/A	II	Yes	UBP	ASME AG-1[14]
30SAD16/26/36/46-AA003/AA004	Manual Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD15/25/35/45-AN001/AN002	Exhaust Fans	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD15/25/35/45-AN003	Exhaust Fans	NS-AQ	N/A	II	Yes	UBP	ASME AG-1[14]

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAD16/26/36/46-AN001	Exhaust Fans	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD13/23/33/43-AT002	HEPA filters	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD13/23/33/43-AC001	Cooling Coils	S	C	I	Yes	UBP	ASME AG-1[14] ASME Class 3
30SAD13/23/33/43-AC002/AC102	Cooling Coils	NS-AQ	D	II	Yes	UBP	ASME AG-1[14]
30SAD13/23/33/43-AT003	Moisture Separators	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD16/26/36/46-AH001	Electric Heaters	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD14/24/34/44-AH001/AH002/ AH003/AH004	Fan Heaters	NS-AQ	N/A	II	Yes	UBP	ASME AG-1[14]
30SAD13/23/33/43-AA004/AA005	Fire Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
30SAD16/26/36/46-AA002	Fire Dampers	S	N/A	I	Yes	UBP	ASME AG-1[14]
SAQ	**Essential Service Water Pump Building Ventilation System**						
30SAQ01/02/03/ 04AA003/004	Cooling Coil Isolation Valves	S	C	I	Yes	URB	ASME Class 3[3]
~~SAQ~~	~~Balance of SAQ System~~	~~S~~	~~N/A~~	~~I~~	~~Yes~~	~~URB~~	~~ASME AG-1~~[14]

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.2.2-1—Classification Summary
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KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30SAQ01/02/03/ 04AC001	Air Cooling Coil	S	C	I	Yes	URB	ASME AG-1 ASME Class 3
30SAQ01/02/03/ 04AA002	Recirc Chiller Balancing Damper	S	N/A	I	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/ 04AT002	Recirc Chiller Prefilter	S	N/A	I	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/ 04AN001	Recirc Fan	S	N/A	I	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/ 04AT001	Recirc Chiller Moisture Separator	S	N/A	I	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/ 04AH001/002	Room Electric Air Heaters	S	N/A	I	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/ 04AA007/005	Inlet/Exhaust Air Isolation Dampers	S	N/A	I	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/ 04AA008/006	Split Cooler Balancing Dampers	NS-AQ	N/A	II	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/ 04AT003	Split Cooler Prefilter	NS-AQ	N/A	II	Yes	URB	ASME AG-1[14]
30SAQ01/02/03/ 04AC002	Split Cooler Chiller Unit	NS-AQ	D	II	Yes	URB	ASME AG-1[14] ASME Class 3
30SAQ01/02/03/ 04AC102	Split Cooler Cooling Unit	NS-AQ	D	II	Yes	URB	ASME AG-1[14] ASME Class 3
30SAQ01/02/03/ 04AN002	Split Cooler Fan	NS-AQ	N/A	II	Yes	URB	ASME AG-1[14]

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Sep Recirc Unit, JMU Rm, SG1	30KLC51AT003	31UJH10010	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, KLC SG2	30KLC52AC001	32UJH05002	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, Vlv Rm, KLC SG2	30KLC52AC002	32UJH10002	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, KLC SG2	30KLC52AN001	32UJH05002	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, Vlv Rm, KLC SG2	30KLC52AN002	32UJH10002	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, Vlv Rm, KLC SG2	30KLC52AT001	32UJH05002	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, Vlv Rm, KLC SG2	30KLC52AT002	32UJH10002	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, KLC SG3	30KLC53AC001	33UJH05002	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, Vlv Rm, KLC SG3	30KLC53AC002	33UJH10002	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, KLC SG3	30KLC53AN001	33UJH05002	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, Vlv Rm, KLC SG3	30KLC53AN002	33UJH10002	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, Vlv Rm, KLC SG3	30KLC53AT001	33UJH05002	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, Vlv Rm, KLC SG3	30KLC53AT002	33UJH10002	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, KLC SG4	30KLC54AC001	34UJH05004	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, KAA vlv rm, SG4	30KLC54AC002	34UJH10004	M	H	SI	S C/NM	Y (3) Y (5)
Chiller Recirc Unit, JMU Rm, SG4	30KLC54AC003	34UJH10010	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, KLC SG4	30KLC54AN001	34UJH05004	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, KAA Vlv Rm, SG4	30KLC54AN002	34UJH10004	M	H	SI	S C/NM	Y (3) Y (5)
Fan Recirc Unit, JMU Rm, SG4	30KLC54AN003	34UJH10010	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, KLC SG4	30KLC54AT001	34UJH05004	M	H	SI	S C/NM	Y (3) Y (5)
Sep Recirc Unit, KAA Vlv Rm, SG4	30KLC54AT002	34UJH10004	M	H	SI	S C/NM	Y (3) Y (5)
Nuclear Auxiliary Building Ventilation System (NABVS)							
Exhaust Air Backdraft Damper	30KLE50AA001	30UFA34075	M	M	SI S	C/NM	Y (5)
Electrical Division of Safeguard Building Ventilation System (SBVSE)							
Outside Air Isolation Damper	30SAC01AA002	31UJK22026	M	M	SI	S C/NM	Y (5)
Outside Air Control Damper	30SAC01AA003	31UJK22026	M	M	SI	S C/NM	Y (5)
Recirc Air Control Damper	30SAC01AA004	31UJK22028	M	M	SI	S C/NM	Y (5)
Supply Air Backdraft Damper	30SAC01AA005	31UJK22026	M	M	SI	S C/NM	Y (5)
Supply Air Cooler	30SAC01AC001	31UJK22026	M	M	SI	S	Y (5)
Supply Air Heater	30SAC01AH002	31UJK22026	M	M	SI	S C/NM	Y (5)
~~Exhaust Air Backdraft Damper, KLE~~	~~30KLE59AA001~~	~~30UFA34075~~	~~M~~	~~M~~	~~SI S~~	~~C/NM~~	~~Y (5)~~
~~Humidifier Heater~~	~~30SAC01AH003~~	~~31UJK22026~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~	~~Y (5)~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)
~~Humidifier Heater~~	~~30SAC01AH004~~	~~31UJK22026~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~		~~Y (5)~~
Fan Motor Heater	30SAC01AH501	31UJK22026	M	M	SI	S	C/NM	Y (5)
Supply Air Fan	30SAC01AN001	31UJK22026	M	M	SI	S	C/NM	Y (5)
Air Inlet Outside Air	30SAC01AT001	31UJK22026	M	M	SI	S		Y (5)
Insect Screen Supply Air	30SAC01AT003	31UJK22026	M	M	SI	S		Y (5)
Supply Air Pre Filter	30SAC01AT004	31UJK22026	M	M	SI	S	C/NM	Y (5)
Supply Air Roughing Filter	30SAC01AT005	31UJK22026	M	M	SI	S	C/NM	Y (5)
Moisture Separator Supply Air Cooler	30SAC01AT006	31UJK22026	M	M	SI	S		Y (5)
~~Supply Air Humidifier~~	~~30SAC01AT007~~	~~31UJK22026~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~		~~Y (5)~~
~~Supply Air Humidifier~~	~~30SAC01AT008~~	~~31UJK22026~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~		~~Y (5)~~
Supply Air Silencer	30SAC01BS001	31UJK22026	M	M	SI	S		Y (5)
Supply Air Silencer	30SAC01BS002	31UJK22026	M	M	SI	S		Y (5)
Recirc Air Silencer	30SAC01BS003	31UJK22039	M	M	SI	S		Y (5)
Outside Air Isolation Damper	30SAC02AA002	32UJK34005	M	M	SI	S	C/NM	Y (5)
Outside Air Control Damper	30SAC02AA003	32UJK34005	M	M	SI	S	C/NM	Y (5)
Recirc Air Control Damper	30SAC02AA004	32UJK31032	M	M	SI	S	C/NM	Y (5)
Supply Air Backdraft Damper	30SAC02AA005	32UJK31007	M	M	SI	S	C/NM	Y (5)
Supply Air Cooler	30SAC02AC001	32UJK34009	M	M	SI	S		Y (5)
Supply Air Heater	30SAC02AH002	32UJK34008	M	M	SI	S	C/NM	Y (5)
Humidifier Heater	30SAC02AH003	32UJK31005	M	M	SII	NS-AQ	C/NM	Y (5)
Humidifier Heater	30SAC02AH004	32UJK31005	M	M	SII	NS-AQ	C/NM	Y (5)
Fan Motor Heater	30SAC02AH501	32UJK31007	M	M	SI	S	C/NM	Y (5)
Supply Air Fan	30SAC02AN001	32UJK31007	M	M	SI	S	C/NM	Y (5)
Air Inlet Outside Air	30SAC02AT001	32UJK38006	M	M	SI	S		Y (5)
Insect Screen Supply Air	30SAC02AT003	32UJK38006	M	M	SI	S		Y (5)
Supply Air Pre Filter	30SAC02AT004	32UJK34006	M	M	SI	S	C/NM	Y (5)
Supply Air Roughing Filter	30SAC02AT005	32UJK34007	M	M	SI	S	C/NM	Y (5)
Moisture Separator Supply Air Cooler	30SAC02AT006	32UJK34009	M	M	SI	S		Y (5)
~~Supply Air Humidifier~~	~~30SAC02AT007~~	~~32UJK31005~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~		~~Y (5)~~
~~Supply Air Humidifier~~	~~30SAC02AT008~~	~~32UJK31005~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~		~~Y (5)~~
Air Inlet Outside Air	30SAC02AT010	32UJK38006	M	M	SI	S		Y (5)
Supply Air Silencer	30SAC02BS001	32UJK31007	M	M	SI	S		Y (5)
Supply Air Silencer	30SAC02BS002	32UJK31007	M	M	SI	S		Y (5)

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)
Recirc Air Silencer	30SAC02BS003	32UJK31032	M	M	SI	S		Y (5)
Outside Air Isolation Damper	30SAC03AA002	33UJK34005	M	M	SI	S	C/NM	Y (5)
Outside Air Control Damper	30SAC03AA003	33UJK34005	M	M	SI	S	C/NM	Y (5)
Recirc Air Control Damper	30SAC03AA004	33UJK31032	M	M	SI	S	C/NM	Y (5)
Supply Air Backdraft Damper	30SAC03AA005	33UJK31007	M	M	SI	S	C/NM	Y (5)
Supply Air Cooler	30SAC03AC001	33UJK34009	M	M	SI	S		Y (5)
Supply Air Heater	30SAC03AH002	33UJK34008	M	M	SI	S	C/NM	Y (5)
~~Humidifier Heater~~	~~30SAC03AH003~~	~~33UJK31005~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~	~~C/NM~~	~~Y (5)~~
~~Humidifier Heater~~	~~30SAC03AH004~~	~~33UJK31005~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~	~~C/NM~~	~~Y (5)~~
Fan Motor Heater	30SAC03AH501	33UJK31007	M	M	SI	S	C/NM	Y (5)
Supply Air Fan	30SAC03AN001	33UJK31007	M	M	SI	S	C/NM	Y (5)
Air Inlet Outside Air	30SAC03AT001	33UJK38006	M	M	SI	S		Y (5)
Insect Screen Supply Air	30SAC03AT003	33UJK38006	M	M	SI	S		Y (5)
Supply Air Pre Filter	30SAC03AT004	33UJK34006	M	M	SI	S	C/NM	Y (5)
Supply Air Roughing Filter	30SAC03AT005	33UJK34007	M	M	SI	S	C/NM	Y (5)
Moisture Separator Supply Air Cooler	30SAC03AT006	33UJK34009	M	M	SI	S		Y (5)
~~Supply Air Humidifier~~	~~30SAC03AT008~~	~~33UJK31005~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~		~~Y (5)~~
Supply Air Silencer	30SAC03BS001	33UJK31007	M	M	SI	S		Y (5)
Supply Air Silencer	30SAC03BS002	33UJK31007	M	M	SI	S		Y (5)
Recirc Air Silencer	30SAC03BS003	33UJK31032	M	M	SI	S		Y (5)
Outside Air Isolation Damper	30SAC04AA002	34UJK22026	M	M	SI	S	C/NM	Y (5)
Outside Air Control Damper	30SAC04AA003	34UJK22026	M	M	SI	S	C/NM	Y (5)
Recirc Air Control Damper	30SAC04AA004	34UJK22028	M	M	SI	S	C/NM	Y (5)
Supply Air Backdraft Damper	30SAC04AA005	34UJK22026	M	M	SI	S	C/NM	Y (5)
Supply Air Cooler	30SAC04AC001	34UJK22026	M	M	SI	S		Y (5)
Supply Air Heater	30SAC04AH002	34UJK22026	M	M	SI	S	C/NM	Y (5)
~~Humidifier Heater~~	~~30SAC04AH003~~	~~34UJK22026~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~		~~Y (5)~~
~~Humidifier Heater~~	~~30SAC04AH004~~	~~34UJK22026~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~		~~Y (5)~~
Fan Motor Heater	30SAC04AH501	34UJK22026	M	M	SI	S	C/NM	Y (5)
Supply Air Fan	30SAC04AN001	34UJK22026	M	M	SI	S	C/NM	Y (5)
Air Inlet Outside Air	30SAC04AT001	34UJK22026	M	M	SI	S		Y (5)
Insect Screen Supply Air	30SAC04AT003	34UJK22026	M	M	SI	S		Y (5)
Supply Air Pre Filter	30SAC04AT004	34UJK22026	M	M	SI	S	C/NM	Y (5)

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)
Supply Air Roughing Filter	30SAC04AT005	34UJK22026	M	M	SI	S	C/NM	Y (5)
Moisture Separator Supply Air Cooler	30SAC04AT006	34UJK22026	M	M	SI	S		Y (5)
~~Supply Air Humidifier~~	~~30SAC04AT007~~	~~34UJK22026~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~		~~Y (5)~~
~~Supply Air Humidifier~~	~~30SAC04AT008~~	~~34UJK22026~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~		~~Y (5)~~
Supply Air Silencer	30SAC04BS001	34UJK22026	M	M	SI	S		Y (5)
Supply Air Silencer	30SAC04BS002	34UJK22026	M	M	SI	S		Y (5)
Recirc Air Silencer	30SAC04BS003	34UJK22039	M	M	SI	S		Y (5)
Isolation Damper	30SAC05AA002	31UJK22026	M	M	SI	S	C/NM	Y(5)
Isolation Damper	30SAC08AA002	31UKJ22026	M	M	SI	S	C/NM	Y(5)
Supply Air Isolation Damper	30SAC11AA001	31UJK22024	M	M	SI	S	C/NM	Y (5)
Supply Air Isolation Damper	30SAC11AA003	31UJK22024	M	M	SI	S	C/NM	Y (5)
Supply Air Adjustable Damper	30SAC11AA004	31UJK22026	M	M	SI	S	C/NM	Y (5)
Supply Air Adjustable Damper	30SAC11AA005	31UJK22026	M	M	SI	S	C/NM	Y (5)
Supply Air Adjustable Damper	30SAC11AA006	31UJK22024	M	M	SI	S	C/NM	Y (5)
Supply Air Adjustable Damper	30SAC11AA007	31UJK22024	M	M	SI	S	C/NM	Y (5)
Fire Damper	30SAC11AA008	31UJK22024	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA009	31UJK31027	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA010	31UJK34024	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA011	31UJK18033	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA012	31UJK18033	M	M	SI	S		Y (5)
Supply Air Adjustable Damper	30SAC11AA013	31UJK18026	M	M	SI	S	C/NM	Y (5)
Supply Air Adjustable Damper	30SAC11AA014	31UJK18026	M	M	SI	S	C/NM	Y (5)
Fire Damper	30SAC11AA015	31UJK18033	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA016	31UJK18022	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA017	31UJK18022	M	M	SI	S		Y (5)
Supply Air Adjustable Damper	30SAC11AA018	31UJK18027	M	M	SI	S	C/NM	Y (5)
Fire Damper	30SAC11AA019	31UJK18024	M	M	SI	S		Y (5)
Supply Air Adjustable Damper	30SAC11AA020	31UJK18027	M	M	SI	S	C/NM	Y (5)
Fire Damper	30SAC11AA021	31UJK18027	M	M	SI	S		Y (5)
Fire Damper	30SAC11AA022	31UJK14033	M	M	SI	S		Y (5)
Supply Air Adjustable Damper	30SAC11AA023	31UJK14025	M	M	SI	S	C/NM	Y (5)
Fire Damper	30SAC11AA024	31UJK14022	M	M	SI	S		Y (5)
Supply Air Adjustable Damper	30SAC11AA025	31UJK14026	M	M	SI	S	C/NM	Y (5)

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)
TechSupport Exhaust Balancing Damp	30SAB42AA012	33UJK26006	M	M	SI	S	C/NM	Y (5)
TechSupport Exhaust Fire Damper	30SAB42AA013	33UJK26006	M	M	SI	S	C/NM	Y (5)
I&CServ/SpecialUse Exhaust Balanc Damp	30SAB42AA014	33UJK26044	M	M	SI	S	C/NM	Y (5)
I&CServ/SpecialUse Exhaust Fire Damp	30SAB42AA015	33UJK26044	M	M	SI	S	C/NM	Y (5)
Tag/ShiftOffice Exhaust Balancing Damp	30SAB42AA016	32UJK26029	M	M	SI	S	C/NM	Y (5)
Tag/ShiftOffice Exhaust Fire Damper	30SAB42AA017	32UJK26029	M	M	SI	S	C/NM	Y (5)
Exhaust Air Fire Damper	30SAB45AA001	32UJK31020	M	M	SI	S	C/NM	Y (5)
Exhaust Air Isolation Damper - A	30SAB45AA003	32UJK31020	M	M	SI	S	C/NM	Y (5)
Exhaust Air Isolation Damper - B	30SAB45AA004	32UJK31020	M	M	SI	S	C/NM	Y (5)
Exhaust Air Balancing Damper	30SAB45AA005	32UJK31020	M	M	SII	NS-AQ	C/NM	Y (5)
Exhaust Air Back-flow Damper	30SAB45AA006	32UJK31020	M	M	SII	NS-AQ	C/NM	Y (5)
Restrooms Exhaust Air Fire Damper	30SAB45AA008	32UJK26020	M	M	SI	S	C/NM	Y (5)
Kitchen Exhaust Fire Damper	30SAB45AA009	33UJK26033	M	M	SI	S	C/NM	Y (5)
Exhaust Fan	30SAB45AN001	32UJK31020	M	M	SII	NS-AQ	C/NM	Y (5)
Exhaust Fan Silencer	30SAB45BS001	32UJK31020	M	M	SII	NS-AQ		Y (5)
Essential Service Water Pump Building Ventilation System (ESWPBVS)								
~~Elec Eq Area Sup Damper Bldg 1~~	~~30SAQ01AA001~~	~~31UQB02001~~	~~M~~	~~M~~	~~SI~~	~~S~~	~~C/NM~~	~~Y (5)~~
~~ESW Pump Area Sup~~ Recirc Chiller Balancing Dmpr Bldg 1	30SAQ01AA002	31UQB02001	M	M	SI	S	C/NM	Y (5)
Plug Valve Chiller Cold Leg Bldg 1	30SAQ01AA003	31UQB02001	M	M	SI	S	C/NM	Y (5)
Plug Valve Chiller Hot Leg Bldg 1	30SAQ01AA004	31UQB02001	M	M	SI	S	C/NM	Y (5)
Recirc Chiller Prefilter Bldg 1	30SAQ01AT002	31UQB02001	M	M	SI	S	C/NM	Y (5)
Recirc Chiller Bldg 1	30SAQ01AC001	31UQB02001	M	M	SI	S	C/NM	Y (5)
Elec Room Air Heater Bldg 1	30SAQ01AH001	31UQB02001	M	M	SI	S	C/NM	Y (5)
Elec Room Air Heater Bldg 1	30SAQ01AH002	31UBQ02001	M	M	SI	S	C/NM	Y (5)
Recirc Fan Bldg 1	30SAQ01AN001	31UQB02001	M	M	SI	S	C/NM	Y (5)
Impact Sep Bldg 1	30SAQ01AT001	31UQB02001	M	M	SI	S	C/NM	Y (5)
Inlet Air Isol Dmpr Bldg 1	30SAQ01AH007	31UBQ02001	M	M	SI	S	C/NM	Y (5)
Exhaust Air Isol Dmpr Bldg 1	30SAQ01AH005	31UBQ02001	M	M	SI	S	C/NM	Y (5)
Split Clr Inlet Balancing Dmpr Bldg 1	30SAQ01AA008	31UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Clr Recirc Balancing Dmpr Bldg 1	30SAQ01AA006	31UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Clr Prefilter Bldg 1	30SAQ01AT003	31UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Refrig Air Chiller Unit Bldg 1	30SAQ01AC002	31UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 187 of 200

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Split Refrig Air Cooler Unit Bldg 1	30SAQ01AC102	31UBQ02001	M	M	SII	NS-AQ C/NM	Y (5)
Split Cooler Fan Bldg 1	30SAQ01AN002	31UBQ02001	M	M	SII	NS-AQ C/NM	Y (5)
~~Elec Eq Area Sup Damper Bldg 2~~	~~30SAQ02AA001~~	~~32UQB02001~~	~~M~~	~~M~~	~~SI~~	~~S~~ ~~C/NM~~	~~Y (5)~~
~~ESW Pump Area Sup~~ Recirc Chiller Balancing Dmpr Bldg 2	30SAQ02AA002	32UQB02001	M	M	SI	S C/NM	Y (5)
Plug Valve Chiller Cold Leg Bldg 2	30SAQ02AA003	32UQB02001	M	M	SI	S C/NM	Y (5)
Plug Valve Chiller Hot Leg Bldg 2	30SAQ02AA004	32UQB02001	M	M	SI	S C/NM	Y (5)
Recirc Chiller Prefilter Bldg 2	30SAQ02AT002	32UBQ02001	M	M	SI	S C/NM	Y (5)
Recirc Chiller Bldg 2	30SAQ02AC001	32UQB02001	M	M	SI	S C/NM	Y (5)
Elec Room Air Heater Bldg 2	30SAQ02AH001	32UQB02001	M	M	SI	S C/NM	Y (5)
Elec Room Air Heater Bldg 2	30SAQ02AH002	32UBQ02001	M	M	SI	S C/NM	Y (5)
Recirc Fan Bldg 2	30SAQ02AN001	32UQB02001	M	M	SI	S C/NM	Y (5)
Impact Sep Bldg 2	30SAQ02AT001	32UQB02001	M	M	SI	S C/NM	Y (5)
Inlet Air Isol Dmpr Bldg 2	30SAQ02AH007	32UBQ02001	M	M	SI	S C/NM	Y (5)
Exhaust Air Isol Dmpr Bldg 2	30SAQ02AH005	32UBQ02001	M	M	SI	S C/NM	Y (5)
Split Clr Inlet Balancing Dmpr Bldg 2	30SAQ02AA008	32UBQ02001	M	M	SII	NS-AQ C/NM	Y (5)
Split Clr Recirc Balancing Dmpr Bldg 2	30SAQ02AA006	32UBQ02001	M	M	SII	NS-AQ C/NM	Y (5)
Split Clr Prefilter Bldg 2	30SAQ02AT003	32UBQ02001	M	M	SII	NS-AQ C/NM	Y (5)
Split Refrig Air Chiller Unit Bldg 2	30SAQ02AC002	32UBQ02001	M	M	SII	NS-AQ C/NM	Y (5)
Split Refrig Air Cooler Unit Bldg 2	30SAQ02AC102	32UBQ02001	M	M	SII	NS-AQ C/NM	Y (5)
Split Cooler Fan Bldg 2	30SAQ02AN002	32UBQ02001	M	M	SII	NS-AQ C/NM	Y (5)
~~Elec Eq Area Sup Damper Bldg 3~~	~~30SAQ03AA001~~	~~33UQB02001~~	~~M~~	~~M~~	~~SI~~	~~S~~ ~~C/NM~~	~~Y (5)~~
~~ESW Pump Area Sup~~Recirc Chiller Balancing Dmpr Bldg 3	30SAQ03AA002	33UQB02001	M	M	SI	S C/NM	Y (5)
Plug Valve Chiller Cold Leg Bldg 3	30SAQ03AA003	33UQB02001	M	M	SI	S C/NM	Y (5)
Plug Valve Chiller Hot Leg Bldg 3	30SAQ03AA004	33UQB02001	M	M	SI	S C/NM	Y (5)
Recirc Chiller Prefilter Bldg 3	30SAQ03AT002	33UBQ02001	M	M	SI	S C/NM	Y (5)
Recirc Chiller Bldg 3	30SAQ03AC001	33UQB02001	M	M	SI	S C/NM	Y (5)
Elec Room Air Heater Bldg 3	30SAQ03AH001	33UQB02001	M	M	SI	S C/NM	Y (5)
Elec Room Air Heater Bldg 3	30SAQ03AH002	33UBQ02001	M	M	SI	S C/NM	Y (5)
Recirc Fan Bldg 3	30SAQ03AN001	33UQB02001	M	M	SI	S C/NM	Y (5)
Impact Sep Bldg 3	30SAQ03AT001	33UQB02001	M	M	SI	S C/NM	Y (5)
Inlet Air Isol Dmpr Bldg 3	30SAQ03AH007	33UBQ02001	M	M	SI	S C/NM	Y (5)

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)
Exhaust Air Isol Dmpr Bldg 3	30SAQ03AH005	33UBQ02001	M	M	SI	S	C/NM	Y (5)
Split Clr Inlet Balancing Dmpr Bldg 3	30SAQ03AA008	33UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Clr Recirc Balancing Dmpr Bldg 3	30SAQ03AA006	33UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Clr Prefilter Bldg 3	30SAQ03AT003	33UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Refrig Air Chiller Unit Bldg 3	30SAQ03AC002	33UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Refrig Air Cooler Unit Bldg 3	30SAQ03AC102	33UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Cooler Fan Bldg 3	30SAQ03AN002	33UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
~~Elec Eq Area Sup Damper Bldg 4~~	~~30SAQ04AA001~~	~~34UQB02001~~	~~M~~	~~M~~	~~SI~~	~~S~~	~~C/NM~~	~~Y (5)~~
~~ESW Pump Area Sup~~Recirc Chiller Balancing Dmpr Bldg 4	30SAQ04AA002	34UQB02001	M	M	SI	S	C/NM	Y (5)
Plug Valve Chiller Cold Leg Bldg 4	30SAQ04AA003	34UQB02001	M	M	SI	S	C/NM	Y (5)
Plug Valve Chiller Hot Leg Bldg 4	30SAQ04AA004	34UQB02001	M	M	SI	S	C/NM	Y (5)
Recirc Chiller Prefilter Bldg 4	30SAQ04AT002	34UBQ02001	M	M	SI	S	C/NM	Y (5)
Recirc Chiller Bldg 4	30SAQ04AC001	34UQB02001	M	M	SI	S	C/NM	Y (5)
Elec Room Air Heater Bldg 4	30SAQ04AH001	34UQB02001	M	M	SI	S	C/NM	Y (5)
Elec Room Air Heater Bldg 4	30SAQ04AH002	34UBQ02001	M	M	SI	S	C/NM	Y (5)
Recirc Fan Bldg 4	30SAQ04AN001	34UQB02001	M	M	SI	S	C/NM	Y (5)
Impact Sep Bldg 4	30SAQ04AT001	34UQB02001	M	M	SI	S	C/NM	Y (5)
Inlet Air Isol Dmpr Bldg 4	30SAQ04AH007	34UBQ02001	M	M	SI	S	C/NM	Y (5)
Exhaust Air Isol Dmpr Bldg 4	30SAQ04AH005	34UBQ02001	M	M	SI	S	C/NM	Y (5)
Split Clr Inlet Balancing Dmpr Bldg 4	30SAQ04AA008	34UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Clr Recirc Balancing Dmpr Bldg 4	30SAQ04AA006	34UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Clr Prefilter Bldg 4	30SAQ04AT003	34UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Refrig Air Chiller Unit Bldg 4	30SAQ04AC002	34UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Refrig Air Cooler Unit Bldg 4	30SAQ04AC102	34UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Split Cooler Fan Bldg 4	30SAQ04AN002	34UBQ02001	M	M	SII	NS-AQ	C/NM	Y (5)
Emergency Power Generating Building Ventilation System (EPGBVS)								
Building Supply Backdraft Damper - Div 1	30SAD11AA003	31UBP02001	M	M	SII	NS-AQ	C/NM	Y (5)
Building Inlet Prefilter - Div 1	30SAD11AT003	31UBP02001	M	M	SII	NS-AQ	C/NM	Y (5)
Supply Fan - Div 1	30SAD11AN003	31UBP02001	M	M	SII	NS-AQ	C/NM	Y (5)
Supply Air Motor Damper - Div 1	30SAD11AA004	31UBP02001	M	M	SI	S	C/NM	Y (5)
Supply Air Manual Damper -Div 1	30SAD11AA005	31UBP01001	M	M	SII	NS-AQ	C/NM	Y (5)
Building Exhaust Motor Damper - Div 1	30SAD15AA004	31UBP02002	M	M	SI	S	C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 189 of 200

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)
Exhaust Fan - Div 1	30SAD15AN003	31UBP02002	M	M	SII	NS-AQ	C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 1	30SAD15AA003	31UBP02002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Motor Damper - Div 1	30SAD13AA007	31UBP01002	M	M	SI	S	C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 1	30SAD13AA008	31UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 1	30SAD13AA009	31UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Prefilter - Div 1	30SAD13AT003	31UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 1	30SAD13AC002	31UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 1	30SAD13AC102	31UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Fan - Div 1	30SAD13AN002	31UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Exhaust Backdraft Damper - Div 1	30SAD13AA010	31UBP01002	M	M	SI	S	C/NM	Y (5)
Building Supply Backdraft Damper - Div 2	30SAD21AA003	32UBP02001	M	M	SII	NS-AQ	C/NM	Y (5)
Building Inlet Prefilter - Div 2	30SAD21AT003	32UBP02001	M	M	SII	NS-AQ	C/NM	Y (5)
Supply Fan - Div 2	30SAD21AN003	32UBP02001	M	M	SII	NS-AQ	C/NM	Y (5)
Supply Air Motor Damper - Div 2	30SAD21AA004	32UBP02001	M	M	SI	S	C/NM	Y (5)
Supply Air Manual Damper -Div 2	30SAD21AA005	32UBP01001	M	M	SII	NS-AQ	C/NM	Y (5)
Building Exhaust Motor Damper - Div 2	30SAD25AA004	32UBP02002	M	M	SI	S	C/NM	Y (5)
Exhaust Fan - Div 2	30SAD25AN003	32UBP02002	M	M	SII	NS-AQ	C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 2	30SAD25AA003	32UBP02002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Motor Damper - Div 2	30SAD23AA007	32UBP01002	M	M	SI	S	C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 2	30SAD23AA008	32UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 2	30SAD23AA009	32UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Prefilter - Div 2	30SAD23AT003	32UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 2	30SAD23AC002	32UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 2	30SAD23AC102	32UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Fan - Div 2	30SAD23AN002	32UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Exhaust Backdraft Damper - Div 2	30SAD23AA010	32UBP01002	M	M	SI	S	C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Building Supply Backdraft Damper - Div 3	30SAD31AA003	33UBP02001	M	M	SII	NS-AQ C/NM	Y (5)
Building Inlet Prefilter - Div 3	30SAD31AT003	33UBP02001	M	M	SII	NS-AQ C/NM	Y (5)
Supply Fan - Div 3	30SAD31AN003	33UBP02001	M	M	SII	NS-AQ C/NM	Y (5)
Supply Air Motor Damper - Div 3	30SAD31AA004	33UBP02001	M	M	SI	S C/NM	Y (5)
Supply Air Manual Damper -Div 3	30SAD31AA005	33UBP01001	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Motor Damper - Div 3	30SAD35AA004	33UBP02002	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 3	30SAD35AN003	33UBP02002	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 3	30SAD35AA003	33UBP02002	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Motor Damper - Div 3	30SAD33AA007	33UBP01002	M	M	SI	S C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 3	30SAD33AA008	33UBP01002	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 3	30SAD33AA009	33UBP01002	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Prefilter - Div 3	30SAD33AT003	33UBP01002	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 3	30SAD33AC002	33UBP01002	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 3	30SAD33AC102	33UBP01002	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Fan - Div 3	30SAD33AN002	33UBP01002	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Exhaust Backdraft Damper - Div 3	30SAD33AA010	33UBP01002	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 4	30SAD41AA003	34UBP02001	M	M	SII	NS-AQ C/NM	Y (5)
Building Inlet Prefilter - Div 4	30SAD41AT003	34UBP02001	M	M	SII	NS-AQ C/NM	Y (5)
Supply Fan - Div 4	30SAD41AN003	34UBP02001	M	M	SII	NS-AQ C/NM	Y (5)
Supply Air Motor Damper - Div 4	30SAD41AA004	34UBP02001	M	M	SI	S C/NM	Y (5)
Supply Air Manual Damper -Div 4	30SAD41AA005	34UBP01001	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Motor Damper - Div 4	30SAD45AA004	34UBP02002	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 4	30SAD45AN003	34UBP02002	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Backdraft Damper - Div 4	30SAD45AA003	34UBP02002	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Motor Damper - Div 4	30SAD43AA007	34UBP01002	M	M	SI	S C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 4	30SAD43AA008	34UBP01002	M	M	SII	NS-AQ C/NM	Y (5)
Electrical Room Supply Air Manual Damper - Div 4	30SAD43AA009	34UBP01002	M	M	SII	NS-AQ C/NM	Y (5)

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 191 of 200

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)
Electrical Room Supply Air Prefilter - Div 4	30SAD43AT003	34UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 4	30SAD43AC002	34UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Cooling Coils - Div 4	30SAD43AC102	34UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Supply Air Fan - Div 4	30SAD43AN002	34UBP01002	M	M	SII	NS-AQ	C/NM	Y (5)
Electrical Room Exhaust Backdraft Damper - Div 4	30SAD43AA010	34UBP01002	M	M	SI	S	C/NM	Y (5)
Building Supply Backdraft Damper - Div 1	30SAD11AA001	31UBP02001	M	M	SI	S	C/NM	Y (5)
Building Supply Backdraft Damper - Div 1	30SAD11AA002	31UBP02001	M	M	SI	S	C/NM	Y (5)
Supply Fan - Div 1	30SAD11AN001	31UBP01001	M	M	SI	S	C/NM	Y (5)
Supply Fan - Div 1	30SAD11AN002	31UBP01001	M	M	SI	S	C/NM	Y (5)
Building Inlet Prefilter - Div 1	30SAD11AT001	31UBP02001	M	M	SI	S	C/NM	Y (5)
Building Inlet Prefilter - Div 1	30SAD11AT002	31UBP02001	M	M	SI	S	C/NM	Y (5)
Diesel Hall Balancing Damper A - Div 1	30SAD12AA001	31UBP02001	M	M	SI	S	C/NM	Y (5)
Diesel Hall Balancing Damper B - Div 1	30SAD12AA002	31UBP01001	M	M	SI	S	C/NM	Y (5)
Diesel Hall Balancing Damper C - Div 1	30SAD12AA003	31UBP01001	M	M	SI	S	C/NM	Y (5)
Diesel Hall Balancing Damper D - Div 1	30SAD12AA004	31UBP01001	M	M	SI	S	C/NM	Y (5)
Diesel Hall Balancing Damper E - Div 1	30SAD12AA005	31UBP01001	M	M	SI	S	C/NM	Y (5)
~~Recirc. Control Damper - Div 1~~	~~30SAD13AA001~~	~~31UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S~~	~~C/NM~~	~~Y (5)~~
Recirc. Balancing Damper - Div 1	30SAD13AA002	31UBP01001	M	M	SI	S	C/NM	Y (5)
~~Recirc Supply Backdraft Damper - Div 1~~	~~30SAD13AA003~~	~~31UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S~~	~~C/NM~~	~~Y (5)~~
Fire Damper - Div 1	30SAD13AA004	31UBP01001	M	M	SII	NS-AQ	C/NM	Y (5)
Fire Damper - Div 1	30SAD13AA005	31UBP01001	M	M	SII	NS-AQ	C/NM	Y (5)
~~Recirc Exhaust Backdraft Damper - Div 1~~	~~30SAD13AA006~~	~~31UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S~~	~~C/NM~~	~~Y (5)~~
Recirc Unit Cooling Coil - Div 1	30SAD13AC001	31UBP01001	M	M	SI	S	C/NM	Y (5)
~~Recirc Unit Chiller Compressor - Div 1~~	~~30SAD13AC101~~	~~31UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S~~	~~C/NM~~	~~Y (5)~~
~~Recirc Unit Heater - Div 1~~	~~30SAD13AH001~~	~~31UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S~~		~~Y (5)~~
~~Recirc Unit Humidifier - Div 1~~	~~30SAD13AH002~~	~~31UBP01001~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~		~~Y (5)~~
Recirc Unit Supply Fan - Div 1	30SAD13AN001	31UBP01001	M	M	SI	S	C/NM	Y (5)
~~Recirc Unit Chiller Fan - Div 1~~	~~30SAD13AN101~~	~~31UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S~~	~~C/NM~~	~~Y (5)~~
Recirc Unit Pre-Filter - Div 1	30SAD13AT001	31UBP01001	M	M	SI	S	C/NM	Y (5)
Recirc Unit HEPA Filter - Div 1	30SAD13AT002	31UBP01001	M	M	SI	S	C/NM	Y (5)
Recirc Unit Moisture Separator - Div 1	30SAD13AT003	31UBP01001	M	M	SI	S		Y (5)
~~Recirc Unit Chiller Filter - Div 1~~	~~30SAD13AT101~~	~~31UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S~~	~~C/NM~~	~~Y (5)~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 192 of 200

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)		EQ Program Designation (Note 5)
Diesel Hall Space Heater/Fan 1 - Div 1	30SAD14AH001	31UBP01001	M	M	SII	NS-AQ	C/NM	Y (5)
Diesel Hall Space Heater/Fan 2 - Div 1	30SAD14AH002	31UBP01001	M	M	SII	NS-AQ	C/NM	Y (5)
Diesel Hall Space Heater/Fan 3 - Div 1	30SAD14AH003	31UBP01001	M	M	SII	NS-AQ	C/NM	Y (5)
Diesel Hall Space Heater/Fan 4 - Div 1	30SAD14AH004	31UBP01001	M	M	SII	NS-AQ	C/NM	Y (5)
Building Exhaust Backdraft Damper-Div 1	30SAD15AA001	31UBP02002	M	M	SI	S	C/NM	Y (5)
Building Exhaust Backdraft Damper-Div 1	30SAD15AA002	31UBP02002	M	M	SI	S	C/NM	Y (5)
Exhaust Fan - Div 1	30SAD15AN001	31UBP01001	M	M	SI	S	C/NM	Y (5)
Exhaust Fan - Div 1	30SAD15AN002	31UBP01001	M	M	SI	S	C/NM	Y (5)
Main Tank Supply Backdraft Damp - Div 1	30SAD16AA001	31UBP01003	M	M	SI	S	C/NM	Y (5)
Main Tank Supply Fire Damper - Div 1	30SAD16AA002	31UBP01003	M	M	SI	S	C/NM	Y (5)
Main Tank Exhaust Balancing Damp A - Div 1	30SAD16AA003	31UBP01003	M	M	SI	S	C/NM	Y (5)
Main Tank Exhaust Balancing Damp B - Div 1	30SAD16AA004	31UBP01003	M	M	SI	S	C/NM	Y (5)
Main Tank Exhaust Backflow Damp - Div 1	30SAD16AA005	31UBP01003	M	M	SI	S	C/NM	Y (5)
Main Tank Supp Damper A - Div 1	30SAD16AA007	31UBP01001	M	M	SI	S	C/NM	Y (5)
Main Tank Supp Damper B - Div 1	30SAD16AA008	31UBP01001	M	M	SI	S	C/NM	Y (5)
Fuel Tank Room Space Heater - Div 1	30SAD16AH001	31UBP01003	M	M	SI	S		Y (5)
Fuel Tank Room Ventilation Fan - Div 1	30SAD16AN001	31UBP01003	M	M	SI	S	C/NM	Y (5)
Building Supply Backdraft Damper - Div 2	30SAD21AA001	32UBP02001	M	M	SI	S	C/NM	Y (5)
Building Supply Backdraft Damper - Div 2	30SAD21AA002	32UBP02001	M	M	SI	S	C/NM	Y (5)
Supply Fan - Div 2	30SAD21AN001	32UBP01001	M	M	SI	S	C/NM	Y (5)
Supply Fan - Div 2	30SAD21AN002	32UBP01001	M	M	SI	S	C/NM	Y (5)
Building Inlet Prefilter - Div 2	30SAD21AT001	32UBP02001	M	M	SI	S	C/NM	Y (5)
Building Inlet Prefilter - Div 2	30SAD21AT002	32UBP02001	M	M	SI	S	C/NM	Y (5)
Diesel Hall Balancing Damper A - Div 2~~1~~	30SAD22AA001	32UBP02001	M	M	SI	S	C/NM	Y (5)
Diesel Hall Balancing Damper B - Div 2~~1~~	30SAD22AA002	32UBP01001	M	M	SI	S	C/NM	Y (5)
Diesel Hall Balancing Damper C - Div 2~~1~~	30SAD22AA003	32UBP01001	M	M	SI	S	C/NM	Y (5)
Diesel Hall Balancing Damper D - Div 2~~1~~	30SAD22AA004	32UBP01001	M	M	SI	S	C/NM	Y (5)
Diesel Hall Balancing Damper E - Div 2~~1~~	30SAD22AA005	32UBP01001	M	M	SI	S	C/NM	Y (5)
~~Recirc. Control Damper - Div 2~~	~~30SAD23AA001~~	~~32UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S~~	~~C/NM~~	~~Y (5)~~
Recirc. Balancing Damper - Div 2	30SAD23AA002	32UBP01001	M	M	SI	S	C/NM	Y (5)
~~Recirc Supply Backdraft Damper - Div 2~~	~~30SAD23AA003~~	~~32UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S~~	~~C/NM~~	~~Y (5)~~
Fire Damper - Div 2	30SAD23AA004	32UBP01001	M	M	SII	NS-AQ	C/NM	Y (5)
Fire Damper - Div 2	30SAD23AA005	32UBP01001	M	M	SII	NS-AQ	C/NM	Y (5)

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment Sheet 194 of 200

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Building Inlet Prefilter - Div 3	30SAD31AT002	33UBP02001	M	M	SI	S C/NM	Y (5)
~~Diesel Hall Balancing Damper A - Div 1~~	~~30SAD32AA001~~	~~33UBP02001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
~~Diesel Hall Balancing Damper B - Div 1~~	~~30SAD32AA002~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
~~Diesel Hall Balancing Damper C - Div 1~~	~~30SAD32AA003~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
~~Diesel Hall Balancing Damper D - Div 1~~	~~30SAD32AA004~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
~~Diesel Hall Balancing Damper E - Div 1~~	~~30SAD32AA005~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
~~Recirc. Control Damper - Div 3~~	~~30SAD33AA001~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Recirc. Balancing Damper - Div 3	30SAD33AA002	33UBP01001	M	M	SI	S C/NM	Y (5)
~~Recirc Supply Backdraft Damper - Div 3~~	~~30SAD33AA003~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Fire Damper - Div 3	30SAD33AA004	33UBP01001	M	M	SII	NS-AQ C/NM	Y (5)
Fire Damper - Div 3	30SAD33AA005	33UBP01001	M	M	SII	NS-AQ C/NM	Y (5)
~~Recirc Exhaust Backdraft Damper - Div 3~~	~~30SAD33AA006~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Recirc Unit Cooling Coil - Div 3	30SAD33AC001	33UBP01001	M	M	SI	S C/NM	Y (5)
~~Recirc Unit Chiller Compressor - Div 3~~	~~30SAD33AC101~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
~~Recirc Unit Heater - Div 3~~	~~30SAD33AH001~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S~~	~~Y (5)~~
~~Recirc Unit Humidifier - Div 3~~	~~30SAD33AH002~~	~~33UBP01001~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~	~~Y (5)~~
Recirc Unit Supply Fan - Div 3	30SAD33AN001	33UBP01001	M	M	SI	S C/NM	Y (5)
~~Recirc Unit Chiller Fan - Div 3~~	~~30SAD33AN101~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Recirc Unit Pre-Filter - Div 3	30SAD33AT001	33UBP01001	M	M	SI	S C/NM	Y (5)
Recirc Unit HEPA Filter - Div 3	30SAD33AT002	33UBP01001	M	M	SI	S C/NM	Y (5)
Recirc Unit Moisture Seperator - Div 3	30SAD33AT003	33UBP01001	M	M	SI	S	Y (5)
~~Recirc Unit Chiller Filter - Div 3~~	~~30SAD33AT101~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Diesel Hall Space Heater/Fan 1 - Div 3	30SAD34AH001	33UBP01001	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 2 - Div 3	30SAD34AH002	33UBP01001	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 3 - Div 3	30SAD34AH003	33UBP01001	M	M	SII	NS-AQ C/NM	Y (5)
Diesel Hall Space Heater/Fan 4 - Div 3	30SAD34AH004	33UBP01001	M	M	SII	NS-AQ C/NM	Y (5)
Building Exhaust Backdraft Damper-Div 3	30SAD35AA001	33UBP02002	M	M	SI	S C/NM	Y (5)
Building Exhaust Backdraft Damper-Div 3	30SAD35AA002	33UBP02002	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 3	30SAD35AN001	33UBP01001	M	M	SI	S C/NM	Y (5)
Exhaust Fan - Div 3	30SAD35AN002	33UBP01001	M	M	SI	S C/NM	Y (5)
Main Tank Supply Backdraft Damp - Div 3	30SAD36AA001	33UBP01003	M	M	SI	S C/NM	Y (5)
Main Tank Supply Fire Damper - Div 3	30SAD36AA002	33UBP01003	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Balancing Damp A - Div 3	30SAD36AA003	33UBP01003	M	M	SI	S C/NM	Y (5)

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment
Sheet 195 of 200

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Main Tank Exhaust Balancing Damp B - Div 3	30SAD36AA004	33UBP01003	M	M	SI	S C/NM	Y (5)
Main Tank Exhaust Backflow Damp - Div 3	30SAD36AA005	33UBP01003	M	M	SI	S C/NM	Y (5)
Main Tank Supp Damper A - Div 3	30SAD36AA007	33UBP01001	M	M	SI	S C/NM	Y (5)
Main Tank Supp Damper B - Div 3	30SAD36AA008	33UBP01001	M	M	SI	S C/NM	Y (5)
Fuel Tank Room Space Heater - Div 3	30SAD36AH001	33UBP01003	M	M	SI	S	Y (5)
Fuel Tank Room Ventilation Fan - Div 3	30SAD36AN001	33UBP01003	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 4	30SAD41AA001	34UBP02001	M	M	SI	S C/NM	Y (5)
Building Supply Backdraft Damper - Div 4	30SAD41AA002	34UBP02001	M	M	SI	S C/NM	Y (5)
Supply Fan - Div 4	30SAD41AN001	34UBP01001	M	M	SI	S C/NM	Y (5)
Supply Fan - Div 4	30SAD41AN002	34UBP01001	M	M	SI	S C/NM	Y (5)
Building Inlet Prefilter - Div 4	30SAD41AT001	34UBP02001	M	M	SI	S C/NM	Y (5)
Building Inlet Prefilter - Div 4	30SAD41AT002	34UBP02001	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper A - Div 1	30SAD42AA001	34UBP02001	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper B - Div 1	30SAD42AA002	34UBP01001	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper C - Div 1	30SAD42AA003	34UBP01001	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper D - Div 1	30SAD42AA004	34UBP01001	M	M	SI	S C/NM	Y (5)
Diesel Hall Balancing Damper E - Div 1	30SAD42AA005	34UBP01001	M	M	SI	S C/NM	Y (5)
~~Recirc. Control Damper - Div 4~~	~~30SAD43AA001~~	~~34UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Recirc. Balancing Damper - Div 4	30SAD43AA002	34UBP01001	M	M	SI	S C/NM	Y (5)
~~Recirc Supply Backdraft Damper - Div 4~~	~~30SAD43AA003~~	~~34UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Fire Damper - Div 4	30SAD43AA004	34UBP01001	M	M	SII	NS-AQ C/NM	Y (5)
Fire Damper - Div 4	30SAD43AA005	34UBP01001	M	M	SII	NS-AQ C/NM	Y (5)
~~Recirc Exhaust Backdraft Damper - Div 4~~	~~30SAD43AA006~~	~~34UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Recirc Unit Cooling Coil - Div 4	30SAD43AC001	34UBP01001	M	M	SI	S C/NM	Y (5)
~~Recirc Unit Chiller Compressor - Div 4~~	~~30SAD43AC101~~	~~34UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
~~Recirc Unit Heater - Div 4~~	~~30SAD43AH001~~	~~34UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S~~	~~Y (5)~~
~~Recirc Unit Humidifier - Div 4~~	~~30SAD43AH002~~	~~34UBP01001~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ~~	~~Y (5)~~
Recirc Unit Supply Fan - Div 4	30SAD43AN001	34UBP01001	M	M	SI	S C/NM	Y (5)
~~Recirc Unit Chiller Fan - Div 4~~	~~30SAD43AN101~~	~~34UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~
Recirc Unit Pre-Filter - Div 4	30SAD43AT001	34UBP01001	M	M	SI	S C/NM	Y (5)
Recirc Unit HEPA Filter - Div 4	30SAD43AT002	34UBP01001	M	M	SI	S C/NM	Y (5)
Recirc Unit Moisture Seperator - Div 4	30SAD43AT003	34UBP01001	M	M	SI	S	Y (5)
~~Recirc Unit Chiller Filter - Div 4~~	~~30SAD43AT101~~	~~34UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S C/NM~~	~~Y (5)~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Letdown Line Flow Transmitter	30KBA14CF752	30UFA01084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
LP Reducing Station Control Valve Positi	30KBA14CG106	30UFA06095	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
VCT Level Transmitter	30KBA20CL750	30UFA10084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
VCT Level Transmitter	30KBA20CL751	30UFA06084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
VCT Level Transmitter	30KBA20CL752	30UFA10084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Charging Pump Discharge Flow Transmitter	30KBA34CF851A	30UFA01033	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Charging Pump Discharge Flow Transmitter	30KBA34CF851B	30UFA01033	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Charging Pump Discharge Flow Transmitter	30KBA34CF852A	30UFA01033	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Charging Pump Discharge Flow Transmitter	30KBA34CF852B	30UFA01033	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Boron Concentration Measurement Transmit	30KBA34CQ857A	30UFA01033	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Boron Concentration Measurement Transmit	30KBA34CQ857B	30UFA01033	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Boron Concentration Measurement Transmit	30KBA34CQ858A	30UFA01033	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Boron Concentration Measurement Transmit	30KBA34CQ858B	30UFA01033	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Charging Pump Discharge Temperature Tran	30KBA34CT857A	30UFA01033	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Charging Pump Discharge Temperature Tran	30KBA34CT857B	30UFA01033	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Charging Pump Discharge Temperature Tran	30KBA34CT858A	30UFA01033	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Charging Pump Discharge Temperature Tran	30KBA34CT858B	30UFA01033	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
JEW							
RCP Seal Water Injection Outside Cont. I	30JEW01AA005	30UFA06045	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
RCP Seal Water Leakoff Inside Containmen	30JEW50AA001	30UJA07016	H	H	ES PAM SI	S 1E EMC	Y (1) Y (5)
RCP Seal Water Leakoff Outside Containme	30JEW50AA002	30UFA06045	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
Spent Fuel Pool Wide Range Level Sensor	30FAK31CL003	30UFA29015	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Spent Fuel Pool Wide Range Level Sensor	30FAK31CL004	30UFA29015	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Spent Fuel Pool Wide Range Level Sensor	30FAK31CL005	30UFA29015	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Spent Fuel Pool Wide Range Level Sensor	30FAK31CL006	30UFA29015	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
AUXILIARY SYSTEMS							
Nuclear Sampling System (NSS)							
RCS HL1 Iso Vlv Actuator	30KUA10AA002	30UJA18003	H	H	SI	S 1E EMC	Y (1) Y (5)
RCS HL1 Inner Cont Iso Vlv Actuator	30KUA10AA003	30UJA07016	H	H	ES PAM SI	S 1E EMC	Y (1) Y (5)
RCS HL1 Outer Iso Cont Vlv Actuator	30KUA10AA004	30UFA06045	M	H	ES PAM SI	S 1E EMC	Y (2) Y (5) Y (6)
Pressurizer Sample Vlv Actuator	30KUA20AA001	30UJB05003	M	M	SI	S 1E EMC	Y (5) Y (6)
Pressurizer Inner Cont Iso Vlv Actuator	30KUA20AA002	30UJB05003	M	M	ES PAM SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
KLA 5 Elec Heater	30KLA50AH001	30UJA29022	H	H	SI	S 1E EMC	Y (1) Y (5)
KLA 5 Tr 1 Fan	30KLA51AN001	30UJA29022	H	H	SI	S 1E EMC	Y (1) Y (5)
KLA 5 Tr 2 Fan	30KLA52AN001	30UJA29022	H	H	SI	S 1E EMC	Y (1) Y (5)
KLA 6 Rx Pit Suppy Fan 1	30KLA65AN001	30UJA15026	H	H	SII	NS-AQ ~~S~~ ~~1E~~ EMC	Y (1) Y (5)
KLA 6 Rx Pit Suppy Fan 3	30KLA65AN002	30UJA15027	H	H	SII	NS-AQ ~~S~~ ~~1E~~ EMC	Y (1) Y (5)
KLA 6 Rx Pit Supply Fan 2	30KLA66AN001	30UJA15026	H	H	SII	NS-AQ ~~S~~ ~~1E~~ EMC	Y (1) Y (5)
KLA 6 Rx Pit Supply Fan 4	30KLA66AN002	30UJA15027	H	H	SII	NS-AQ ~~S~~ ~~1E~~ EMC	Y (1) Y (5)
Pos Meas 1 KLA10AA001	30KLA10CG001A	30UFA15045	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas 2 KLA10AA001	30KLA10CG001B	30UFA15045	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas 1 KLA10AA003	30KLA10CG003A	30UJA18016	H	H	SI	S 1E EMC	Y (1) Y (5)
Pos Meas 2 KLA10AA003	30KLA10CG003B	30UJA18016	H	H	SI	S 1E EMC	Y (1) Y (5)
Press Meas 1 KLA Supply	30KLA10CP001	30UFA24095	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
Press Meas 2 KLA Supply	30KLA10CP002	30UFA24095	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)
KLA Purge Vent DP Sens 1	30KLA20CP001	30UJA23013	H	H	SII	NS-AQ EMC	Y (1) Y (5)
KLA Purge Vent DP Sens 2	30KLA20CP002	30UJA23013	H	H	SII	NS-AQ EMC	Y (1) Y (5)
DP Meas KLA21AT001	30KLA21CP501	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA21AT002	30KLA21CP502	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA21AT003	30KLA21CP503	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA21AT004	30KLA21CP504	30UFA24080	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas 21 Filter Banks	30KLA21CP505	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA21AH005 Downstream	30KLA21CT001	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA21AH005 Upstream	30KLA21CT002	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA21AT003 Downstream	30KLA21CT003	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
KLA Purge Fitrl Tr 2 Flow Meas	30KLA22CF001	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA22AT001	30KLA22CP501	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA22AT002	30KLA22CP502	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA22AT003	30KLA22CP503	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas KLA22AT004	30KLA22CP504	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP Meas 22 Filter Banks	30KLA22CP505	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA22AH005 Downstream	30KLA22CT001	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA22AH005 Upstream	30KLA22CT002	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas KLA22AT003 Downstream	30KLA22CT003	30UFA24081	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Pos Meas KLA30AA001	30KLA30CG001	30UFA21065	M	H	SII	NS-AQ EMC	Y (2) Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)			EQ Program Designation (Note 5)			
Pos Meas 1 KLA30AA002	30KLA30CG002A	30UFA17095	M	H	SI	S	1E	EMC		Y (2)	Y (5)	Y (6)
Pos Meas 2 KLA30AA002	30KLA30CG002B	30UFA17095	M	H	SI	S	1E	EMC		Y (2)	Y (5)	Y (6)
Pos Meas 1 KLA30AA003	30KLA30CG003A	30UJA18016	H	H	SI	S	1E	EMC	Y (1)		Y (5)	
Pos Meas 2 KLA30AA003	30KLA30CG003B	30UJA18016	H	H	SI	S	1E	EMC	Y (1)		Y (5)	
Pos Meas 1 KLA40AA002	30KLA40CG002A	30UFA21095	M	H	SI	S	1E	EMC		Y (2)	Y (5)	Y (6)
Pos Meas 2 KLA40AA002	30KLA40CG002B	30UFA21095	M	H	SI	S	1E	EMC		Y (2)	Y (5)	Y (6)
Pos Meas KLA40AA004	30KLA40CG004	30UJA18016	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 5 Flow Measurement	30KLA50CF001	30UJA29022	H	H	SI	S	1E	EMC	Y (1)		Y (5)	
DP Meas KLA50AT001	30KLA50CP501	30UJA29022	H	H	SI	S	1E	EMC	Y (1)		Y (5)	
DP Meas KLA50AT002	30KLA50CP502	30UJA29022	H	H	SI	S	1E	EMC	Y (1)		Y (5)	
DP Meas KLA50AT003	30KLA50CP503	30UJA29022	H	H	SI	S	1E	EMC	Y (1)		Y (5)	
DP Meas KLA50AT004	30KLA50CP504	30UJA29022	H	H	SI	S	1E	EMC	Y (1)		Y (5)	
Temp Meas KLA50AH001 Downstream	30KLA50CT001	30UJA29022	H	H	SI	S	1E	EMC	Y (1)		Y (5)	
Temp Meas KLA50AH001 Upstream	30KLA21CT003	30UFA24081	M	H	SI	S	1E	EMC		Y (2)	Y (5)	Y (6)
Temp Meas KLA50AT003 Downstream	30KLA21CT003	30UFA24081	M	H	SI	S	1E	EMC		Y (2)	Y (5)	Y (6)
KLA DP Sens 1 SG1	30KLA60CP851	30UFA13004	M	H	SI	S	1E	EMC		Y (2)	Y (5)	Y (6)
KLA DP Sens 1 SG2	30KLA60CP852	32UJH10002	M	H	SI	S	1E	EMC		Y (2)	Y (5)	Y (6)
KLA DP Sens 1 SG3	30KLA60CP853	33UJH10002	M	H	SI	S	1E	EMC		Y (2)	Y (5)	Y (6)
KLA DP Sens 1 SG4	30KLA60CP854	30UFA10052	M	H	SI	S	1E	EMC		Y (2)	Y (5)	Y (6)
KLA 6 Supply Air Temp Meas 1	30KLA61CT001	30UJA23017	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 Supply Air Temp Meas 2	30KLA61CT002	30UJA23017	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 RCP1 Air Temp Meas	30KLA61CT003	30UJA23002	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 RCP2 Air Temp Meas	30KLA61CT004	30UJA34005	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 SG1 Air Temp Meas	30KLA61CT005	30UJA34003	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 SG2 Air Temp Meas	30KLA61CT006	30UJA34004	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 Eq Comp CRDM Air Temp Meas	30KLA61CT007	30UJA15001	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 FAL Valves Air Temp Meas	30KLA61CT008	30UJA23020	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 KTA Pumps Air Temp Meas	30KLA61CT011	30UJA07022	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 Supply Air Temp Meas 3	30KLA63CT001	30UJA23018	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 Supply Air Temp Meas 4	30KLA63CT002	30UJA23018	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 RCP3 Air Temp Meas	30KLA63CT003	30UJA34006	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 RCP4 Air Temp Meas	30KLA63CT004	30UJA23009	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	
KLA 6 SG3 Air Temp Meas	30KLA63CT005	30UJA34007	H	H	SII	NS-AQ		EMC	Y (1)		Y (5)	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
KLA 7 Hot Pip Pen Temp Sens	30KLA71CT015	30UJA07016	H	H	SII	NS-AQ EMC	Y (1) Y (5)
Annulus Ventilation System (AVS)							
Actuator Supply Damper (Train 21)	30KLB21AA003	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Exhaust Damper (Train 21)	30KLB21AA004	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Electric Heater (Train 21)	30KLB21AH001	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Exhaust Fan (Train 21)	30KLB21AN001	30UFA17083	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Supply Damper (Train 24)	30KLB24AA003	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Exhaust Damper (Train 24)	30KLB24AA004	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Electric Heater (Train 24)	30KLB24AH001	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Exhaust Fan (Train 24)	30KLB24AN001	30UFA17081	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Supply Air Isolation Damper	30KLB34AA002	30UFA21095	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Supply Air Isolation Damper	30KLB34AA003	30UFA21095	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Exhaust Air Isolation Damper	30KLB44AA002	30UFA29054	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Actuator Exhaust Air Isolation Damper	30KLB44AA003	30UFA29054	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Accident Filtration Train Flow Sensor	30KLB21CF001A	30UFA21095	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Accident Filtration Train Flow Sensor	30KLB21CF001B	30UFA21095	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Exhaust Fan Pressure Limit Switch Sensor	30KLB21CP002	30UFA17083	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Pre- And HEPA Filter DP Gauge (Train 21)	30KLB21CP501	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
HEPA Filter DP Gauge (Train 21)	30KLB21CP502	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Iodine Adsorber DP Gauge (Train 21)	30KLB21CP503	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Downstream HEPA Filter DP Gauge	30KLB21CP504	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Filter Bank DP Gauge (Train 21)	30KLB21CP505	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temperature Sensor Upstream of Heater	30KLB21CT001	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp ~~Limit Switch~~ Regulation Sensor for Heater	30KLB21CT002	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temperature Regulation Sensor for Heater	30KLB21CT003	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temperature Sensor Downstream of Carbon Adsorber	30KLB21CT004	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Exhaust Fan Pressure Limit Switch Sensor	30KLB24CP002	30UFA17081	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Pre- and HEPA Filter DP Gauge (Train 24)	30KLB24CP501	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
HEPA Filter DP Gauge (Train 24)	30KLB24CP502	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Iodine Adsorber DP Gauge (Train 24)	30KLB24CP503	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Downstream HEPA Filter DP Gauge	30KLB24CP504	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)

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Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Filter Bank DP Gauge (Train 24)	30KLB24CP505	30UFA17084	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temperature Sensor Upstream of Heater	30KLB24CT001	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp ~~Limit Switch~~ Regulation Sensor for Heater	30KLB24CT002	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temperature Regulation Sonsor for Heater	30KLB24CT003	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Temperature Sensor Downstream of Carbon Adsorber	30KLB24CT004	30UFA17082	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Safeguard Building Controlled Area Ventilation System (SBVS)							
Vol Cont Dmpr Sup, Div 1	30KLC11AA003	31UJH05025	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Iso Dmpr 1 Sup, Div 1	30KLC11AA004	31UJH05025	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Iso Dmpr 2 Sup, Div 1	30KLC11AA005	31UJH05025	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Is Dmpr, Div 1, SG1	30KLC11AA007	31UJH05006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Vol Cont Dmpr Sup, Div 2	30KLC12AA003	32UJH01020	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 1, Div 2	30KLC12AA004	32UJH01020	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 2, Div 2	30KLC12AA005	32UJH01020	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 1, Air Lock, SG2	30KLC12AA009	32UJH10006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 2, Air Lock, SG2	30KLC12AA010	32UJH10006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Vol Cont Dmpr Sup, Div 3	30KLC13AA003	33UJH01020	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 1, Div 3	30KLC13AA004	33UJH01020	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 2, Div 3	30KLC13AA005	33UJH01020	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Vol Cont Dmpr Sup, Div 4	30KLC14AA003	34UJH05025	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 1, Div 4	30KLC14AA004	34UJH05025	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr 2, Div 4	30KLC14AA005	34UJH05025	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Sup Iso Dmpr, Div 4	30KLC14AA007	34UJH05006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Dmpr KAA Vlv Rm, Anteroom, SG1	30KLC21AA002	31UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Exh Iso Dmpr, SG1	30KLC21AA005	31UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Vol Cntrl Dmpr, Div 1	30KLC21AA006	31UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 1, Div 1	30KLC21AA007	31UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 2, Div 1	30KLC21AA008	31UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 2, Div 1	30KLC21AA010	31UJH10010	M	H	SI	S 1E EMC	Y(2) Y(5) Y(6)
Oper Ex Vol Cntrl Dmpr, Div 2	30KLC22AA006	32UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 1, Div 2	30KLC22AA007	32UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Oper Ex Iso Dmpr 2, Div 2	30KLC22AA008	32UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)

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Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
DP 4, SG1	30KLC31CP854	32UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 1, SG2	30KLC32CP851	32UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 2, SG2	30KLC32CP852	32UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 3, SG2	30KLC32CP853	32UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 4, SG2	30KLC32CP854	32UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 1, SG3	30KLC33CP851	33UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 2, SG3	30KLC33CP852	33UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 3, SG3	30KLC33CP853	33UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 4, SG3	30KLC33CP854	33UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 1, SG4	30KLC34CP851	33UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 2, SG4	30KLC34CP852	33UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 3, SG4	30KLC34CP853	33UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP 4, SG4	30KLC34CP854	33UJH10001	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP, Acc Ex Tr 1	30KLC41CP001	30UFA21082	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC41AT001	30KLC41CP501	30UFA21082	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC41AT002	30KLC41CP502	30UFA21082	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC41AT003	30KLC41CP503	30UFA21082	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC41AT004	30KLC41CP504	30UFA21082	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
~~Upstream Temp, Acc Ex Tr 1~~	~~30KLC41CT001~~	~~30UFA21082~~	~~M~~	~~H~~	~~SI~~	~~S 1E EMC~~	~~Y (2) Y (5) Y (6)~~
Upstream Temp Sensor Acc Ex Tr 1 Heater	30KLC41CT004	30UFA21082	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Downstream Temp Sensors Acc Ex Tr 1 Heater	30KLC41CT001/ 002	30UFA21082	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Downstream Temp Sensor Acc Ex Tr 1 Carbon Adsorber	30KLC41CT003	30UFA21082	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP, Acc Ex Tr 2	30KLC42CP001	30UFA21084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC42AT001	30KLC42CP501	30UFA21084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC42AT002	30KLC42CP502	30UFA21084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC42AT003	30KLC42CP503	30UFA21084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
DP KLC42AT004	30KLC42CP504	30UFA21084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Upstream Temp, Acc Ex Tr 2	30KLC42CT001	30UFA21084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
~~Flow Meas 1 Tot Acc Ex~~	~~30KLC45CF001~~	~~30UFA21095~~	~~M~~	~~H~~	~~SI~~	~~S 1E EMC~~	~~Y (2) Y (5) Y (6)~~
Upstream Temp Sensor Acc Ex Tr 2 Heater	30KLC42CT004	30UFA21084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Downstream Temp Sensors Acc Ex Tr 2 Heater	30KLC42CT001/ 002	30UFA21084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Downstream Temp Sensor Acc Ex Tr 2 Carbon Adsorber	30KLC42CT003	30UFA21084	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Flow Meas 2 Tot Acc Ex	30KLC45CF002	30UFA21095	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1 JND Pump Rm, SG1	30KLC51CT001	31UJH01002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2 JND Pump Rm, SG1	30KLC51CT002	31UJH01002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1 JNG Pump Rm, SG1	30KLC51CT003	31UJH01006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2 JNG Pump Rm, SG1	30KLC51CT004	31UJH01006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1 KAA Vlv Rm, SG1	30KLC51CT005	31UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2 KAA Vlv Rm, SG1	30KLC51CT006	31UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1 JMU Rm, SG1	30KLC51CT007	31UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2 JMU Rm, SG1	30KLC51CT008	31UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, JND Pump Rm, SG2	30KLC52CT001	32UJH01007	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, JND Pump Rm, SG2	30KLC52CT002	32UJH01007	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, JNG Pump Rm, SG2	30KLC52CT003	32UJH01009	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, JNG Pump Rm, SG2	30KLC52CT004	32UJH01009	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1 Vlv Rm, SG2	30KLC52CT005	32UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2 Vlv Rm, SG2	30KLC52CT006	32UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, JND Pump Rm, SG3	30KLC53CT001	33UJH01007	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, JND Pump Rm, SG3	30KLC53CT002	33UJH01007	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, JNG Pump Rm, SG3	30KLC53CT003	33UJH01009	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, JNG Pump Rm, SG3	30KLC53CT004	33UJH01009	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, Vlv Rm SG3	30KLC53CT005	33UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, Vlv Rm, SG3	30KLC53CT006	33UJH10002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas 1, JND Pump Rm, Div 4	30KLC54CT001	34UJH01002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas 2, JND Pump Rm, Div 4	30KLC54CT002	34UJH01002	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas 1, JNG Pump Rm, Div 4	30KLC54CT003	34UJH01006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Meas 2, JNG Pump Rm, Div 4	30KLC54CT004	34UJH01006	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, KAA Vlv Rm, SG4	30KLC54CT005	34UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, KAA Vlv Rm, SG4	30KLC54CT006	34UJH10004	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 1, JMU Rm, SG4	30KLC54CT007	34UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Temp Sens 2, JMU Rm, SG4	30KLC54CT008	34UJH10010	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Electrical Division of Safeguard Building Ventilation System (SBVSE)							
Actuator Supply Air Damper	30SAC01AA003	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Supply Air Flow Div 1	30SAC01CF001	31UJK22024	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Inlet Control Damper	30SAC01CG003	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Recirc Control Damper	30SAC01CG004	31UJK22028	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Bank Diff Pressure Sensor	30SAC01CP001	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Pre Filter Diff Pressure Sensor	30SAC01CP501	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Differential Pressure Sensor	30SAC01CP502	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC01CT001	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC01CT002	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC01CT003	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC01CT004	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC01CT005	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC01CT006	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC01CT501	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC01CT502	31UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Flow Div 2	30SAC02CF002	32UJK31005	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Inlet Control Damper	30SAC02CG003	32UJK31005	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Recirc Control Damper	30SAC02CG003	32UJK31005	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Bank Diff Pressure Sensor	30SAC02CP001	32UJK31018	M	M	SI	S 1E EMC	Y (5) Y (6)
Pre Filter Bank Diff Pressure Sensor	30SAC02CP501	32UJK31018	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Differential Pressure Sensor	30SAC02CP502	32UJK31018	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC02CT001	32UJK38006	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC02CT002	32UJK38006	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC02CT003	32UJK34008	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC02CT004	32UJK34008	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC02CT005	32UJK34008	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC02CT006	32UJK31005	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC02CT501	32UJK34008	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC02CT502	32UJK34009	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Flow Div 3	30SAC03CF001	33UJK31005	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Inlet Control Damper	30SAC03CG003	33UJK34005	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Recirc Control Damper	30SAC03CG004	33UJK31018	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Bank Diff Pressure Sensor	30SAC03CP001	32UJK31018	M	M	SI	S 1E EMC	Y (5) Y (6)
Pre Filter Diff Pressure Sensor	30SAC03CP501	33UJK31018	M	M	SI	S 1E EMC	Y (5) Y (6)

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Filter Differential Pressure Sensor	30SAC03CP502	33UJK31018	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC03CT001	33UJK38006	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC03CT002	33UJK38006	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC03CT003	33UJK34008	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC03CT004	33UJK34008	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC03CT005	33UJK34008	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC03CT006	33UJK31005	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC03CT501	33UJK34008	M	M	SI	S 1E EMC	Y (5) Y (6)
~~Supply Air Temperature Sensor~~	~~30SAC03CT502~~	~~33UJK34009~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y (6)~~
Supply Air Flow Div 4	30SAC03CF001	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Inlet Control Damper	30SAC04CG003	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Recirc Control Damper	30SAC04CG004	34UJK22028	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Bank Diff Pressure Sensor	30SAC04CP001	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Pre Filter Diff Pressure Sensor	30SAC04CP501	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Filter Differential Pressure Sensor	30SAC04CP502	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC04CT001	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Outside Air Temperature Sensor	30SAC04CT002	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC04CT003	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC04CT004	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC04CT005	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC04CT006	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC04CT501	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Temperature Sensor	30SAC04CT502	34UJK22026	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Flow Sensor	30SAC11CF001	31UJK18027	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Rm Supply Air Flow Sensor	30SAC11CF002	31UJK14026	M	M	SI	S 1E EMC	Y (5) Y (6)
Supply Air Flow Sensor	30SAC11CF003	31UJK26026	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Supply Air	30SAC11CG003A	31UJK22024	M	M	SI	S 1E EMC	Y (5) Y (6)
Position Indicator Maint Supply Air	30SAC11CG003B	31UJK22024	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Room Supply Air Temp Sensor	30SAC11CT001	31UJK18027	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Rm Air Temperature Sensor	30SAC11CT002	31UJK18028	M	M	SI	S 1E EMC	Y (5) Y (6)
I&C Area Temperature Sensor	30SAC11CT003	31UJK18024	M	M	SI	S 1E EMC	Y (5) Y (6)
Battery Rm Supply Air Temperature Sensor	30SAC11CT004	31UJH01026	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Battery Room Air Temperature Sensor	30SAC11CT005	31UJK14028	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
SAB14 Filtr Train Iso Dmpr Dwnstrm	30SAB14AA003	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB14 Filtr Train Recirc Iso Dmpr	30SAB14AA004	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB14 Recirc Backdraft Damper	30SAB14AA005	32UJK31034	M	M	SII	NS-AQ	Y (5) Y (6)
SAB14 Filtration Trn Electric Preheater	30SAB14AH001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Recirc. Vol Contr Damper A	30SAB42AA001	32UJK26031	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Isolation Damper - A	30SAB45AA003	32UJK31020	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Isolation Damper - B	30SAB45AA004	32UJK31020	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Vol. Cont. Posit. Indic. - Div 1	30SAB01CG012	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Conditioning Train 01 Flow Measurement	30SAB01CF001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. HEPA DP - Div 1	30SAB01CP002	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Pre-Filter DP - Div 1	30SAB01CP501	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. HEPA DP (Local) - Div 1	30SAB01CP504	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Inlet Temp - Div 1	30SAB01CT001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater Outlet Temp - Div 1 A	30SAB01CT002	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater Outlet Temp - Div 1 B	30SAB01CT003	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater Outlet Temp - Div 1 C	30SAB01CT004	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. CoolCoil Inlet Temp (Local) -Div 1	30SAB01CT501	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. CoolCoil Exit Temp (Local) -Div 1	30SAB01CT502	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Smoke Detector	30SAB01SD001	32UJK31034	M	M	SII	NS-AQ	Y (5) Y (6)
Conditioning Train 02 Flow Measurement	30SAB02CF001	32UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. HEPA DP - Div 2	30SAB02CP002	32UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. HEPA DP (Local) - Div 2	30SAB02CP504	32UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. CoolCoil Inlet Temp (Local) -Div 2	30SAB02CT501	32UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. CCoil Outlet Temp (Local) - Div 2	30SAB02CT502	32UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Conditioning Train 03 Flow Measurement	30SAB03CF001	32UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. HEPA DP - Div 3	30SAB03CP002	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. HEPA DP (Local) - Div 3	30SAB03CP504	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc CoolCoil Inlet Temp (Local) -Div 3	30SAB03CT501	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. Cool Coil Exit Temp (Local) -Div 3	30SAB03CT502	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Vol Cont Damp Position Indic-Div 4	30SAB04CG012	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Conditioning Train 04 Flow Measurement	30SAB04CF001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Pre-Filter DP - Div 4	30SAB04CP501	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. HEPA DP (Local) - Div 4	30SAB04CP504	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment Sheet 120 of 135

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Makeup Air Inlet Temp - Div 4	30SAB04CT001	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater Outlet Temp - Div 4 A	30SAB04CT002	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater Outlet Temp - Div 4 B	30SAB04CT003	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Makeup Air Heater Outlet Temp - Div 4 C	30SAB04CT004	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc CoolCoil Inlet Temp (Local) - Div 4	30SAB04CT501	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc. CoolCoil Exit Temp (Local) - Div 4	30SAB04CT502	33UJK31035	M	M	SI	S 1E EMC	Y (5) Y (6)
Smoke Detector	30SAB04SD001	32UJK31034	M	M	SII	NS-AQ	Y (5)
Iodine Filtration Train 01 Flow Measurement	30SAB11CF001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtr. Filter DP - Div 1	30SAB11CP001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Pre-Filter DP - Div 1	30SAB11CP501	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtr. Inlet HEPA DP - Div1	30SAB11CP502	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Charcoal DP - Div 1	30SAB11CP503	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Outlet HEPA DP - Div 1	30SAB11CP504	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB11 Filtr Train Temp Sens 1	30SAB11CT001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB11 Filtr Train Temp Sens 2	30SAB11CT002	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Train 01 Carbon Adsorber Outlet Temp Sens	30SAB11CT003	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Train 04 Flow Measurement	30SAB14CF001	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Filter DP - Div 4	30SAB14CP001	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Pre-Filter DP - Div 4	30SAB14CP501	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Inlet HEPA DP - Div 4	30SAB14CP502	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Charcoal DP - Div 4	30SAB14CP503	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Outlet HEPA DP - Div 4	30SAB14CP504	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB14 Filtr Train Temp Sens 1	30SAB14CT001	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
SAB14 Filtr Train Temp Sens 2	30SAB14CT002	33UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
Iodine Filtration Train 04 Carbon Adsorber Outlet Temp Sens	30SAB14CT003	32UJK31034	M	M	SI	S 1E EMC	Y (5) Y (6)
MCR Supply Duct Heater Oultet Air Flow	30SAB32CF001	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
Tag/Shift Off Supply Duct Heat Exit Flow	30SAB32CF002	33UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
WC & Kitchen Supply Duct Heat Exit Flow	30SAB32CF003	32UJK26015	M	M	SI	S 1E EMC	Y (5) Y (6)
Kitchen Supply Duct Heater Exit Flow	30SAB32CF004	33UJK26044	M	M	SI	S 1E EMC	Y (5) Y (6)
I&CService Supply Duct Heat Exit Flow	30SAB32CF005	33UJK26034	M	M	SI	S 1E EMC	Y (5) Y (6)
Special Use Supply Duct Heater Exit Flow	30SAB32CF006	33UJK26032	M	M	SI	S 1E EMC	Y (5) Y (6)

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
TechSupport Supply Duct Heater Exit Flow	30SAB32CF007	33UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
DP between MCR and Anteroom A	30SAB32CP001	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
DP between MCR and Anteroom B	30SAB32CP002	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
DP between MCR and Anteroom C	30SAB32CP003	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
DP between MCR and Anteroom (Local)	30SAB32CP501	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
MCR Supply Duct Heater Oultet Air Temp	30SAB32CT001	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
MCR Temp A	30SAB32CT002	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
MCR Temp B	30SAB32CT003	32UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
Tagging/ShiftOffice Heater Exit Temp	30SAB32CT004	33UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
Tagging Rm Temp	30SAB32CT005	33UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
I&C Service Center Rm Temp A	30SAB32CT006	33UJK26034	M	M	SI	S 1E EMC	Y (5) Y (6)
SICS1 / Computer Rm 1 Temp	30SAB32CT007	32UJK26002	M	M	SI	S 1E EMC	Y (5) Y (6)
SICS2 / Computer Rm 2 Temp	30SAB32CT008	33UJK26002	M	M	SI	S 1E EMC	Y (5) Y (6)
WC & Kitchen Supply Duct Heat Exit Temp	30SAB32CT009	32UJK26015	M	M	SI	S 1E EMC	Y (5) Y (6)
Kitchen (MCR Staff) Temp	30SAB32CT010	32UJK26031	M	M	SI	S 1E EMC	Y (5) Y (6)
Kitchen Supply Duct Heater Outlet Temp	30SAB32CT011	33UJK26044	M	M	SI	S 1E EMC	Y (5) Y (6)
Kitchen Temp	30SAB32CT012	33UJK26044	M	M	SI	S 1E EMC	Y (5) Y (6)
I&CService Supply Duct Heater Exit Temp	30SAB32CT013	33UJK26034	M	M	SI	S 1E EMC	Y (5) Y (6)
I&C Service Center Rm Temp B	30SAB32CT014	33UJK26034	M	M	SI	S 1E EMC	Y (5) Y (6)
SpecialUse Supply Duct Heat Exit Temp	30SAB32CT015	33UJK26032	M	M	SI	S 1E EMC	Y (5) Y (6)
Special Use Temp	30SAB32CT016	33UJK26032	M	M	SI	S 1E EMC	Y (5) Y (6)
TechSupp Supply Duct Heat Exit Temp	30SAB32CT017	33UJK26030	M	M	SI	S 1E EMC	Y (5) Y (6)
Tech Support Center Temp	30SAB32CT018	33UJK26006	M	M	SI	S 1E EMC	Y (5) Y (6)
Essential Service Water Pump Building Ventilation System (ESWPBVS)							
Elec Room Air Heater Bldg 1	30SAQ01AH001	31UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 1	30SAQ01AH002	31UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Fan Bldg 1	30SAQ01AN001	31UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Inlet Air Isol Dmpr Bldg 1	30SAQ01AA007	31UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Isol Dmpr Bldg 1	30SAQ01AA005	31UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Split Cooler Fan Bldg 1	30SAQ01AN002	31UQB02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Split Cooler Condenser Bldg 1	30SAQ01AC102	31UQB02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 2	30SAQ02AH001	32UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 2	30SAQ02AH002	32UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Recirc Fan Bldg 2	30SAQ02AN001	32UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Inlet Air Isol Dmpr Bldg 2	30SAQ02AA007	32UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Isol Dmpr Bldg 2	30SAQ02AA005	32UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Split Cooler Fan Bldg 2	30SAQ02AN002	32UQB02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Split Cooler Condenser Bldg 2	30SAQ02AC102	32UQB02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 3	30SAQ03AH001	33UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 3	30SAQ03AH002	33UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Fan Bldg 3	30SAQ03AN001	33UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Inlet Air Isol Dmpr Bldg 3	30SAQ03AA007	33UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Isol Dmpr Bldg 3	30SAQ03AA005	33UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Split Cooler Fan Bldg 3	30SAQ03AN002	33UQB02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Split Cooler Condenser Bldg 3	30SAQ03AC102	33UQB02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 4	30SAQ04AH001	34UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Elec Room Air Heater Bldg 4	30SAQ04AH002	34UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Recirc Fan Bldg 4	30SAQ04AN001	34UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Inlet Air Isol Dmpr Bldg 4	30SAQ04AH002	34UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Air Isol Dmpr Bldg 4	30SAQ04AA005	34UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Split Cooler Fan Bldg 4	30SAQ04AN002	34UQB02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Split Cooler Condenser Bldg 4	30SAQ04AC102	34UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
~~Room~~Outside Air Temp Sensor Bldg 1	30SAQ01CT001	31UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
~~Room~~Outside Air Temp Sensor Bldg 2	30SAQ02CT001	32UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
~~Room~~Outside Air Temp Sensor Bldg 3	30SAQ03CT001	33UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
~~Room~~Outside Air Temp Sensor Bldg 4	30SAQ04CT001	34UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 1	30SAQ01CT002	31UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 1	30SAQ01CT003	31UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 2	30SAQ02CT002	32UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 2	30SAQ02CT003	32UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 3	30SAQ03CT002	33UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 3	30SAQ03CT003	33UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 4	30SAQ04CT002	34UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Electric Heater Temperature Sensor Bldg 4	30SAQ04CT003	34UQB02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Emergency Power Generating Building Ventilation System (EPGBVS)							
Supply Fan - Div 1	30SAD11AN003	31UBP02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Supply Air Motor Damper - Div 1	30SAD11AA004	31UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Building Exhaust Motor Damper - Div 1	30SAD15AA004	31UBP02002	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 1	30SAD15AN003	31UBP02002	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Air Motor Damper - Div 1	30SAD13AA007	31UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Fan - Div 1	30SAD13AN002	31UBP01002	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Low/Hi Temperature Alarm Sensor - Div 1	30SAD12CT006	31UBP01001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Supply/Exhaust Control Temp Sensor - Div 1	30SAD12CT007	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Intake Air Temperature Sensor - Div 1	30SAD13CT005	31UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Temperature Sensor - Div 1	30SAD13CT006	31UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Supply Filter Pressure - Div 1	30SAD11CP513	31UBP02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Filter Pressure - Div 1	30SAD13CP503	31UBP01002	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Fan - Div 2	30SAD21AN003	32UBP02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Air Motor Damper - Div 2	30SAD21AA004	32UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Building Exhaust Motor Damper - Div 2	30SAD25AA004	32UBP02002	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 2	30SAD25AN003	32UBP02002	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Air Motor Damper - Div 2	30SAD23AA007	32UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Fan - Div 2	30SAD23AN002	32UBP01002	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Low/Hi Temperature Alarm Sensor - Div 2	30SAD22CT006	32UBP01001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Supply/Exhaust Control Temp Sensor - Div 2	30SAD22CT007	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Intake Air Temperature Sensor - Div 2	30SAD23CT005	32UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Temperature Sensor - Div 2	30SAD23CT006	32UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Supply Filter Pressure - Div 2	30SAD21CP513	32UBP02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Filter Pressure - Div 2	30SAD23CP503	32UBP01002	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Fan - Div 3	30SAD31AN003	33UBP02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Air Motor Damper - Div 3	30SAD31AA004	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment Sheet 124 of 135

Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Building Exhaust Motor Damper - Div 3	30SAD35AA004	33UBP02002	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 3	30SAD35AN003	33UBP02002	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Air Motor Damper - Div 3	30SAD33AA007	33UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Fan - Div 3	30SAD33AN002	33UBP01002	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Low/Hi Temperature Alarm Sensor - Div 3	30SAD32CT006	33UBP01001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Supply/Exhaust Control Temp Sensor - Div 3	30SAD32CT007	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Intake Air Temperatur Sensor - Div 3	30SAD33CT005	33UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Temperatur Sensor - Div 3	30SAD33CT006	33UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Supply Filter Pressure - Div 3	30SAD31CP513	33UBP02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Filter Pressure - Div 3	30SAD33CP503	33UBP01002	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Fan - Div 4	30SAD41AN003	34UBP02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Air Motor Damper - Div 4	30SAD41AA004	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y (6)
Building Exhaust Motor Damper - Div 4	30SAD45AA004	34UBP02002	M	M	SI	S 1E EMC	Y (5) Y (6)
Exhaust Fan - Div 4	30SAD45AN003	34UBP02002	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Air Motor Damper - Div 4	30SAD43AA007	34UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Fan - Div 4	30SAD43AN002	34UBP01002	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Low/Hi Temperature Alarm Sensor - Div 4	30SAD42CT006	34UBP01001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Diesel Hall Supply/Exhaust Control Temp Sensor - Div 4	30SAD42CT007	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Intake Air Temperature Sensor - Div 4	30SAD43CT005	34UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Electrical Room Supply Air Temperature Sensor - Div 4	30SAD43CT006	34UBP01002	M	M	SI	S 1E EMC	Y (5) Y (6)
Diesel Hall Supply Filter Pressure - Div 4	30SAD41CP513	34UBP02001	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Electrical Room Supply Filter Pressure - Div 4	30SAD43CP503	34UBP01002	M	M	SII	NS-AQ EMC	Y (5) Y (6)
Supply Air Fan - Div 1	30SAD11AN001	31UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Air Fan - Div 1	30SAD11AN002	31UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
~~Recirc. Control Damper - Div 1~~	~~30SAD13AA001~~	~~31UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
~~Recirc Unit Heater - Div 1~~	~~30SAD13AH001~~	~~31UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
Recirc Unit Supply Fan - Div 1	30SAD13AN001	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Exhaust Fan - Div 1	30SAD15AN001	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Exhaust Fan - Div 1	30SAD15AN002	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Main Tank Supp Damper A - Div 1	30SAD16AA007	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Main Tank Supp Damper B - Div 1	30SAD16AA008	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Fuel Tank Room Space Heater - Div 1	30SAD16AH001	31UBP01003	M	M	SI	S 1E EMC	Y (5) Y(6)
Fuel Tank Room Ventilation Fan - Div 1	30SAD16AN001	31UBP01003	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Air Fan - Div 2	30SAD21AN001	32UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Air Fan - Div 2	30SAD21AN002	32UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
~~Recirc. Control Damper - Div 2~~	~~30SAD23AA001~~	~~32UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
~~Recirc Unit Heater - Div 2~~	~~30SAD23AH001~~	~~32UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
Recirc Unit Supply Fan - Div 2	30SAD23AN001	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Exhaust Fan - Div 2	30SAD25AN001	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Exhaust Fan - Div 2	30SAD25AN002	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Main Tank Supp Damper A - Div 2	30SAD26AA007	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Main Tank Supp Damper B - Div 2	30SAD26AA008	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Fuel Tank Room Space Heater - Div 2	30SAD26AH001	32UBP01003	M	M	SI	S 1E EMC	Y (5) Y(6)
Fuel Tank Room Ventilation Fan - Div 2	30SAD26AN001	32UBP01003	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Air Fan - Div 3	30SAD31AN001	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Air Fan - Div 3	30SAD31AN002	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
~~Recirc. Control Damper - Div 3~~	~~30SAD33AA001~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
~~Recirc Unit Heater - Div 3~~	~~30SAD33AH001~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
Recirc Unit Supply Fan - Div 3	30SAD33AN001	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Exhaust Fan - Div 3	30SAD35AN001	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Exhaust Fan - Div 3	30SAD35AN002	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Main Tank Supp Damper A - Div 3	30SAD36AA007	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Main Tank Supp Damper B - Div 3	30SAD36AA008	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Fuel Tank Room Space Heater - Div 3	30SAD36AH001	33UBP01003	M	M	SI	S 1E EMC	Y (5) Y(6)
Fuel Tank Room Ventilation Fan - Div 3	30SAD36AN001	33UBP01003	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Air Fan - Div 4	30SAD41AN001	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Air Fan - Div 4	30SAD41AN002	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
~~Recirc. Control Damper - Div 4~~	~~30SAD43AA001~~	~~34UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
~~Recirc Unit Heater - Div 4~~	~~30SAD43AH001~~	~~34UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
Recirc Unit Supply Fan - Div 4	30SAD43AN001	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Exhaust Fan - Div 4	30SAD45AN001	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Exhaust Fan - Div 4	30SAD45AN002	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Main Tank Supp Damper A - Div 4	30SAD46AA007	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Main Tank Supp Damper B - Div 4	30SAD46AA008	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Fuel Tank Room Space Heater - Div 4	30SAD46AH001	34UBP01003	M	M	SI	S 1E EMC	Y (5) Y(6)
Fuel Tank Room Ventilation Fan - Div 4	30SAD46AN001	34UBP01003	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Components Pressure - Div 1	30SAD11CP501	31UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Components Pressure - Div 1	30SAD11CP502	31UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Filter Pressure - Div 1	30SAD11CP511	31UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Filter Pressure - Div 1	30SAD11CP512	31UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Building Supply Air Temperature - Div 1	30SAD11CT001	31UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature A - Div 1	30SAD12CT001	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature B - Div 1	30SAD12CT002	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature C - Div 1	30SAD12CT003	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature D - Div 1	30SAD12CT004	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature E - Div 1	30SAD12CT005	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
~~Recirc Flow Rate - Div 1~~	~~30SAD13CF001~~	~~31UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
~~EDG Control Rm Moisture - Div 1~~	~~30SAD13CM001~~	~~31UBP01002~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ 1E EMC~~	~~Y (5) Y(6)~~
Recirc Pre-filter Pressure - Div 1	30SAD13CP501	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Recirc HEPA Filter Pressure - Div 1	30SAD13CP502	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Recirc Supply Temperature - Div 1	30SAD13CT001	31UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
EDG Control Rm Temperature A - Div 1	30SAD13CT002	31UBP01002	M	M	SI	S 1E EMC	Y (5) Y(6)
EDG Control Rm Temperature B - Div 1	30SAD13CT003	31UBP01002	M	M	SI	S 1E EMC	Y (5) Y(6)
~~Recirc Heater Outlet Temperature - Div 1~~	~~30SAD13CT004~~	~~31UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
Diesel Hall Heater/Fan Temp A - Div 1	30SAD14CT001	31UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Diesel Hall Heater/Fan Temp B - Div 1	30SAD14CT002	31UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Diesel Hall Heater/Fan Temp C - Div 1	30SAD14CT003	31UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Diesel Hall Heater/Fan Temp D - Div 1	30SAD14CT004	31UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Main Tank Temperature - Div 1	30SAD16CT001	31UBP01003	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Components Pressure - Div 2	30SAD21CP501	32UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Components Pressure - Div 2	30SAD21CP502	32UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Supply Filter Pressure - Div 2	30SAD21CP511	32UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Filter Pressure - Div 2	30SAD21CP512	32UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Building Supply Air Temperature - Div 2	30SAD21CT001	32UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature A - Div 2	30SAD22CT001	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature B - Div 2	30SAD22CT002	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature C - Div 2	30SAD22CT003	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature D - Div 2	30SAD22CT004	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature E - Div 2	30SAD22CT005	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
~~Recirc Flow Rate - Div 2~~	~~30SAD23CF001~~	~~32UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
~~EDG Control Rm Moisture - Div 1~~	~~30SAD23CM001~~	~~32UBP01002~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ 1E EMC~~	~~Y (5) Y(6)~~
Recirc Pre-filter Pressure - Div 2	30SAD23CP501	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Recirc HEPA Filter Pressure - Div 2	30SAD23CP502	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Recirc Supply Temperature - Div 2	30SAD23CT001	32UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
EDG Control Rm Temperature A - Div 2	30SAD23CT002	32UBP01002	M	M	SI	S 1E EMC	Y (5) Y(6)
EDG Control Rm Temperature B - Div 2	30SAD23CT003	32UBP01002	M	M	SI	S 1E EMC	Y (5) Y(6)
~~Recirc Heater Outlet Temperature - Div 2~~	~~30SAD23CT004~~	~~32UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
Diesel Hall Heater/Fan Temp A - Div 2	30SAD24CT001	32UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Diesel Hall Heater/Fan Temp B - Div 2	30SAD24CT002	32UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Diesel Hall Heater/Fan Temp C - Div 2	30SAD24CT003	32UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Diesel Hall Heater/Fan Temp D - Div 2	30SAD24CT004	32UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Main Tank Temperature - Div 2	30SAD26CT001	32UBP01003	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Components Pressure - Div 3	30SAD31CP501	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Components Pressure - Div 3	30SAD31CP502	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Filter Pressure - Div 3	30SAD31CP511	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Filter Pressure - Div 3	30SAD31CP512	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Building Supply Air Temperature - Div 3	30SAD31CT001	33UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature A - Div 3	30SAD32CT001	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature B - Div 3	30SAD32CT002	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature C - Div 3	30SAD32CT003	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature D - Div 3	30SAD32CT004	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature E - Div 3	30SAD32CT005	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
~~Recirc Flow Rate - Div 3~~	~~30SAD33CF001~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
~~EDG Control Rm Moisture - Div 1~~	~~30SAD33CM001~~	~~33UBP01002~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ 1E EMC~~	~~Y (5) Y(6)~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
Recirc Pre-filter Pressure - Div 3	30SAD33CP501	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Recirc HEPA Filter Pressure - Div 3	30SAD33CP502	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Recirc Supply Temperature - Div 3	30SAD33CT001	33UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
EDG Control Rm Temperature A - Div 3	30SAD33CT002	33UBP01002	M	M	SI	S 1E EMC	Y (5) Y(6)
EDG Control Rm Temperature B - Div 3	30SAD33CT003	33UBP01002	M	M	SI	S 1E EMC	Y (5) Y(6)
~~Recirc Heater Outlet Temperature - Div 3~~	~~30SAD33CT004~~	~~33UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
Diesel Hall Heater/Fan Temp A - Div 3	30SAD34CT001	33UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Diesel Hall Heater/Fan Temp B - Div 3	30SAD34CT002	33UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Diesel Hall Heater/Fan Temp C - Div 3	30SAD34CT003	33UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Diesel Hall Heater/Fan Temp D - Div 3	30SAD34CT004	33UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Main Tank Temperature - Div 3	30SAD36CT001	33UBP01003	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Components Pressure - Div 4	30SAD41CP501	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Components Pressure - Div 4	30SAD41CP502	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Filter Pressure - Div 4	30SAD41CP511	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Supply Filter Pressure - Div 4	30SAD41CP512	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Building Supply Air Temperature - Div 4	30SAD41CT001	34UBP02001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature A - Div 4	30SAD42CT001	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature B - Div 4	30SAD42CT002	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature C - Div 4	30SAD42CT003	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature D - Div 4	30SAD42CT004	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Diesel Hall Area Temperature E - Div 4	30SAD42CT005	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
~~Recirc Flow Rate - Div 4~~	~~30SAD43CF001~~	~~34UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
~~EDG Control Rm Moisture - Div 1~~	~~30SAD43CM001~~	~~34UBP01002~~	~~M~~	~~M~~	~~SII~~	~~NS-AQ 1E EMC~~	~~Y (5) Y(6)~~
Recirc Pre-filter Pressure - Div 4	30SAD43CP501	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Recirc HEPA Filter Pressure - Div 4	30SAD43CP502	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
Recirc Supply Temperature - Div 4	30SAD43CT001	34UBP01001	M	M	SI	S 1E EMC	Y (5) Y(6)
EDG Control Rm Temperature A - Div 4	30SAD43CT002	34UBP01002	M	M	SI	S 1E EMC	Y (5) Y(6)
EDG Control Rm Temperature B - Div 4	30SAD43CT003	34UBP01002	M	M	SI	S 1E EMC	Y (5) Y(6)
~~Recirc Heater Outlet Temperature - Div 4~~	~~30SAD43CT004~~	~~34UBP01001~~	~~M~~	~~M~~	~~SI~~	~~S 1E EMC~~	~~Y (5) Y(6)~~
Diesel Hall Heater/Fan Temp A - Div 4	30SAD44CT001	34UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Diesel Hall Heater/Fan Temp B - Div 4	30SAD44CT002	34UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Diesel Hall Heater/Fan Temp C - Div 4	30SAD44CT003	34UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)
Diesel Hall Heater/Fan Temp D - Div 4	30SAD44CT004	34UBP01001	M	M	SII	NS-AQ ~~1E~~ EMC	Y (5) Y(6)

Table 3.11-2—List of U.S. EPR Important to Safety Systems Screened for the EQ Program
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Category	Systems
Fluid Systems	Reactor Coolant JE (except JEW), JA, JDA[1]
	Safety Injection & Residual Heat Removal JNA, JND, JNG
	Component Cooling Water KA
	Essential Service Water PE
	Safety Chilled Water QK
	Extra Borating JDH
	Feedwater LA
	Emergency Feedwater LAR, LAS
	In-containment Refueling Water Storage Tank (IRWST) JNK
	Main Steam LB
	Steam Generator Blowdown LCQ
	Chemical & Volume Control System KBA, KBD, JEW
	Spent Fuel Pool Cooling FAK
Auxiliary Systems	Nuclear Sampling KU
	Sampling Activity Monitoring KLK
	Emergency Diesel Generator Set XJA, XKA, XJN, XJV, XJG, XJQ, XJR, XJX, XCN
	Combustible Gas Control JMT

The motor-operated air-tight dampers—located on the normal operation filtration train supply and exhaust ducts—isolate the secondary containment in case of a postulated accident. The redundant dampers in the supply and exhaust trains are powered by different electrical divisions backed by separate emergency diesel generators. The dampers can be operated automatically or manually from the main control room (MCR). In the event of a station blackout (SBO), these dampers are automatically closed by batteries.

The fire dampers on both supply and exhaust trains are located at the wall penetration between the Fuel Building and the annulus. These dampers are equipped with thermal sensors for automatic closing, and can be closed or re-opened remotely if not released by the thermal sensor.

6.2.3.2.2.2 AVS Accident Trains

The AVS accident filtration trains are shown on Figure 6.2.3-2. The filtration trains are engineered safety feature (ESF) filters and are used during postulated accidents to contain leakage from the primary containment by maintaining a subatmospheric pressure in the annulus. The exhaust air from the annulus is filtered before release to the environment via the vent stack.

There are two full capacity ESF trains, each consists of an air-tight motor-controlled damper, ~~an~~ two stage electrical heater, a pre-filter, an upstream HEPA filter, an iodine absorber, a downstream HEPA filter, an air-tight motor controlled damper, a fan, and a back-draft damper. The filter system components are designed in accordance with Regulatory Guide 1.52, and are described in Section 6.5.1.

During a postulated accident, the ESF filtration trains collect the containment leakage from the annulus, remove airborne radioactivity through the filtration train, and release the filtered air to the vent stack. The AVS accident trains reduce the pressure in the annulus to at least -0.25 inches water gauge or less and maintain the lower subatmospheric pressure. The system is capable of maintaining a uniform negative pressure throughout the secondary containment structure following the design basis loss of coolant accident (LOCA).

The exhaust air is monitored and sampled for radiation levels before release to the vent stack, as described in Section 11.5.3.1.10 and Table 11.5-1, Monitors R-27 and R-28.

The two ESF trains are physically separated by being installed in separate rooms of the Fuel Building, which are also in separate fire areas. The two ESF trains are powered by different electrical divisions backed by separate emergency diesel generators.

6.2.3.2.2.3 System Operation

The normal operation filtration train is in service during normal plant operation, including cold shutdown and outages. During normal operation, the isolation dampers are in the open position and the annulus is continuously vented. The subatmospheric pressure inside the annulus is maintained by regulating the control damper located on the supply side of the normal operation filtration train. The supply air from the AVS maintains the annulus temperature between 45°F and 113°F.

A failure of the normal operation filtration train leads to the loss of supply and exhaust air to the annulus. In this case, one of the accident filtration trains is started, and the two isolation dampers on the supply and exhaust side of the normal filtration train are closed to isolate the normal operation filtration train and maintain the leak tightness of the annulus.

In case of a postulated accident, a containment isolation signal causes the normal filtration train to automatically stop. The normal filtration train supply air isolation dampers close immediately and the exhaust isolation dampers close with a delay, to maintain the annulus negative pressure during the switchover to the accident filtration trains. Both accident filtration trains start on receipt of a containment isolation signal and an alarm is issued in the MCR.

At the start of an accident, full power of two stage electric heater is switched on when the fans start and filter bank isolation dampers open. As the negative pressure is drawn down in the annulus and when the temperature downstream of the heater increases to 158°F, the first step of heater power is switched off automatically. As the temperature downstream of the heater reaches 176°F, the second step of the heater is also switched off automatically.

6.2.3.2.3 Bypass Leakage

Certain containment penetrations introduce the potential for primary containment leakage to bypass the filtered annulus and escape directly to the environment. Potential bypass leakage paths exist through the double seals of the equipment hatch, personnel airlocks, fuel transfer tube, and containment ventilation system isolation valves.

The leak-off system provides a means to capture bypass leakage and route it to the annulus to be processed. The leak-off system is located in the Reactor Containment Building, Reactor Building Annulus, Fuel Building, and Safegurard Buildings 2 and 3, and consists of valves, sensors and piping. It is composed of three main subsystems: containment leakage exhaust subsystem (CLES), containment inflating/deflating subsystem (CIDS), and containment leak-tightness test subsystem (CLTS). The CLES collects leaks from various systems and components in the Reactor Containment

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Annulus Ventilation System (AVS)	Accident Filtration Train Heater Control (Figure 7.3-31)	This function is described in Sections 6.2.3, 6.5.1, and 7.3.1.3.1.~~The AVS has a safety related function to maintain capability of the iodine absorbers to remove iodine from the annulus exhaust air. The radiological filter air heaters are used to limit the relative humidity to a maximum of 70% when the AVS accident trains are in operation (RG 1.52 and ASME N509-89).~~	NO	N/A	N/A	~~The I&C associated with the AVS is described in Sections 6.2.3 and 6.5.1.~~
Annulus Ventilation System (AVS)	Accident Train Switchover (Figure 7.3-32)	This function is described in Sections 6.2.3, 6.5.1, and 7.3.1.3.1.~~The AVS has a safety related function to maintain a negative pressure (GDC 16, GDC 43, Containment Leakage Testing per 10 CFR 50 Appendix J, and NRC RG 1.52 Rev 3 to provide filtration of Engineered Safety Feature Atmospheric Cleanup). In case of a failure during accident operation of an operating accident filtration train, and a negative pressure is not being maintained in the annulus, operation shall be switched to the non-operating accident filtration train to maintain a negative pressure.~~	NO	N/A	N/A	~~The I&C associated with the AVS is described in Sections 6.2.3 and 6.5.1.~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Component Cooling Water System (CCWS)	~~CCWS~~ Common 1.b Automatic Backup Switchover of Train 1 to Train 2 (Figure 7.3-33)	This function is described in Sections 7.3.1.4.1 and 9.2.2. ~~The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function to perform an automatic switchover from Train 1 to Train 2 verifies that the CCWS is capable of fulfilling its safety-related function to remove heat from safety-related components on the CCWS Common 1.a and 1.b.~~	Interdivisional communications is required because sensors in Div. 1 that determine a loss of Train 1, are used to initiate Train 2 and switchover equipment in Div. 2.	Discrete	~~Vote~~None	~~The I&C associated with the CCWS is described in Section 9.2.2~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~(1) Div 2 to Div 1 — To switch from Train 1 to Train 2 requires a low Surge Tank Level in Div 2 : (2) Close Train 1 supply and return valves by removing power from the valves associated pilot valves that are powered via Div 1, 2, 3, and 4: (3) Div 1 to Div 2 - Verify Train 1 1.b supply and return valves are closed prior to Train 2 supply and return valves opening (i.e. interlock function)): (4) Open Train 2 supply and return valves by applying power to the valves associated pilot valves that are powered via Div 1, 2, 3, and 4~~			

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Component Cooling Water System (CCWS)	~~CCWS~~ Common 1.b Automatic Backup Switchover of Train 2 to Train 1 (Figure 7.3-33)	This function is described in Sections 7.3.1.4.1 and 9.2.2.~~The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function to perform an automatic switchover from Train 2 to Train 1 verifies that the CCWS is capable of fulfilling its safety-related function to remove heat from safety-related components on the CCWS Common 1.a and 1.b.~~	Similar to Train 1 to Train 2 Switchover	Discrete	~~Vote~~None	~~The I&C associated with the CCWS is described in Section 9.2.2.~~
Component Cooling Water System (CCWS)	~~CCWS~~ Common 2.b Automatic Backup Switchover of Train 3 to Train 4 (Figure 7.3-33)	This function is described in Sections 7.3.1.4.1 and 9.2.2.~~The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function to perform an automatic switchover from Train 3 to Train 4 verifies that the CCWS is capable of fulfilling its safety-related function to remove heat from safety-related components on the CCWS Common 2.a and 2.b.~~	Similar to Train 1 to Train 2 Switchover, but for Train 3 to Train 4	Discrete	~~Vote~~None	~~The I&C associated with the CCWS is described in Section 9.2.2.~~

Table 7.1-5—SAS Automatic Safety Function
Sheet 5 of 58

System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Component Cooling Water System (CCWS)	~~CCWS~~ Common 2.b Automatic Backup Switchover of Train 4 to Train 3 (Figure 7.3-33)	This function is described in Sections 7.3.1.4.1 and 9.2.2.~~The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function to perform an automatic switchover from Train 4 to Train 3 verifies that the CCWS is capable of fulfilling its safety-related function to remove heat from safety-related components on the CCWS Common 2.a and 2.b.~~	Similar to Train 1 to Train 2 Switchover, but for Train 4 to Train 3	Discrete	~~Vote~~None	~~The I&C associated with the CCWS is described in Section 9.2.2.~~
Component Cooling Water System (CCWS)	~~CCWS~~ Emergency Temperature Control (Figure 7.3-34)	This function is described in Sections 7.3.1.4.1 and 9.2.2.~~The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function to control the CCWS heat exchanger (HX) outlet temperature is required to maintain the temperature of the cooling water within its limits. This verifies that the CCWS is capable of fulfilling its safety relegated function to remove heat from safety-related components.~~	NO	N/A	N/A	~~The I&C associated with the CCWS is described in Section 9.2.2.~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Component Cooling Water System (CCWS)	~~CCWS~~ Emergency Leak Detection (Figure 7.3-35)	This function is described in Sections 7.3.1.4.1 and 9.2.2. ~~The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function for emergency leak detection maintains the required cooling water inventory that supports the safety-related function to remove heat using indications to detect leaks and isolate them (GDC 44).~~	NO	N/A	N/A	~~The I&C associated with the CCWS is described in Section 9.2.2.~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Component Cooling Water System (CCWS)	~~CCWS~~ Switchover Valve Interlock (Figure 7.6-1)	This function is described in Sections 7.6.1.2.5 and 9.2.2.~~The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The interlock function is required to verify that the two trains connected to their common headers remain separated and each are able to provide their corresponding LHSI HX with the required flow for heat removal. Removing heat from the LHSI HX is a safety-related function.~~	If the either of the supply and return valves for a given Train (1 or 2, 3 or 4) are open with respect to a given header (1.a, 1.b, 2.a, or 2.b) then the other corresponding train supply and return valves are given a close command. Train 1 valves are in Div 1, Train 2 valves in Div 2 and so on. Therefore, the signals are sent across divisions for the close command discussed. Hence, the on coming trains supply and return valves are not allowed to open until the corresponding off going trains supply and return valves are closed.	Discrete	~~Vote~~None	~~The I&C associated with the CCWS is described in Sections 7.6 and 9.2.2.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Component Cooling Water System (CCWS)	~~CCWS~~ RCP Thermal Barrier Containment Isolation Valve Interlock (Figure 7.6-2)	This function is described in Sections 7.6.1.2.5 and 9.2.2.~~The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The interlock function is required to verify that the Common 1.b and 2.b headers remain separated and each of their trains are able to provide their corresponding LHSI HX with the required flow for heat removal. Removing heat from the LHSI HX is a safety-related function.~~	The Inner and Outer Containment Isolation Valves are powered from different divisions. For the Common 1.b header, the outer valves (supply and return) are supplied by Div 1 and the inner valves by Div 4. The opposite is true for the Common 2.b header. To be able to switch between headers, at least one of the supply valves (outer or inner) and one of the return valves (outer or inner) must be closed. Therefore, the state (open or closed) of these valves must be communicated across divisions.	Discrete	Vote	~~The I&C associated with the CCWS is described in Sections 7.6 and 9.2.2.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Component Cooling Water System (CCWS)	~~CCWS~~ Emergency Leak Detection - Switchover Valves Leakage or Failure (Figure 7.3-36)	This function is described in Sections 7.3.1.4.1 and 9.2.2.~~The CCWS has a safety-related function to remove heat from SAS components (GDC 44). The safety-related function for switchover valve leakage or failure isolates the CCWS trains from their common headers to verify that each train is able to provide their corresponding LHSI HX with the required flow for heat removal. Removing heat from the LHSI HX is a safety-related function.~~	This function looks at surge tank level in the two corresponding Trains (Trains 1 and 2, Trains 3 and 4) that feed a common header. If the surge tank level in the on-line train is lowering while the surge tank level the off-line train is rising then a seat leakage on one of the off line train switchover valves is likely. Therefore, interdivisional communication is required since information from more than one division is being utilized.	Discrete	Vote	~~The I&C associated with the CCWS is described in Section 9.2.2.~~

**Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Component Cooling Water System (CCWS)	~~CCWS~~ SCWS Condenser Supply Water Flow Control (Figure 7.3-37)	This function is described in Sections 7.3.1.4.1 and 9.2.2. ~~The CCWS has a safety-related function that controls CCWS flow to the SCWS condenser and provides a heat sink for heat rejection, therefore providing reasonable assurance that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	NO	NA	NA	~~The I&C associated with the CCWS is described in Section 9.2.2.~~
Emergency Feedwater System (EFWS)	SG Closed Loop Level Control (Figure 7.3-4)	This function is described in Sections 7.3.1.3.2 and 10.4.9. ~~The EFWS has a safety-related function to:~~ 1. ~~Provide flow to the steam generators to restore and maintain decay heat removal from the RCS to assist in the cool down and depressurization of the RCS to the RHRS entry conditions following AOOs and PAs.~~	NO	N/A	N/A	~~The I&C associated with the EFWS is described in Sections 7.3 and 10.4.9.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
		2. ~~Maintain the water inventory in the steam generators following a LOOP, and the resulting loss of MFW, for decay heat removal.~~ ~~The safety-related function to provide SG Closed Loop Level Control verifies that the EFWS is capable of fulfilling its safety-related function of maintaining the SG water inventory for decay heat removal, following a LOOP and the resulting loss of MFW.~~				
Emergency Feedwater System (EFWS)	EFW Pump Flow Control (Figure 7.3-4)	This function is described in Sections 7.3.1.3.2 and 10.4.9.~~The EFWS has a safety-related function to:~~ 1. ~~Provide flow to the SGs to restore and maintain decay heat removal from the RCS to assist in the cool down and depressurization of the RCS to the RHRS entry conditions following AOOs and PAs.~~	NO	N/A	N/A	~~The I&C associated with the EFWs is described in Sections 7.3 and 10.4.9.~~

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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
		2. ~~Maintain the water inventory in the steam generators following a LOOP, and the resulting loss of MFW, for decay heat removal.~~ ~~The safety-related function to provide EFW pump flow control to maintain EFWS pump flow at the design flow verifies that the EFWS is capable of fulfilling its safety-related function of providing flow to the steam generators, below the maximum allowable flow rate to a depressurized SG, to support its safe shut down capabilities.~~				
~~Essential Service Water System (ESWS)~~	~~Automatic ESWS Actuation from CCWS Start~~	~~The ESWS has a safety-related function to remove heat from safety-related components (GDC 44). The Automatic ESWS Actuation from CCWS Start function removes heat from the CCWS (Trains 2 and 3) and the EDGs ensuring the ESWS is capable of fulfilling its safety-related function to remove heat from the corresponding CCWS train.~~	~~NO~~	~~N/A~~	~~N/A~~	~~The I&C associated with the ESWS is described in Section 9.2.1.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Essential Service Water Pump Building Ventilation System (ESWPBVS)	~~Remove Heat Generated by Essential Service Water Equipment~~ ESWS Pump Rooms Temperature Control (Figure 7.3-38)	This function is described in Sections 7.3.1.4.3 and 9.4.11. ~~The ESWPBVS has an safety-related function that maintains ambient conditions for safety-related components during normal operation (GDC 4, GDC 17).~~	NO	N/A	N/A	~~The I&C associated with the ESWS systems is described in Section 9.4.11.~~
Fuel Building Ventilation System (FBVS)	Safety-Related Rooms Heater Control (Figure 7.3-39)	This function is described in Sections 7.3.1.4.4 and 9.4.2. ~~The FBVS has an safety-related function that maintains the room ambient conditions for safety-related boron rooms during normal operation, abnormal operation, and postulated accident events (GDC 27, GDC 60, GDC 61).~~	NO	N/A	N/A	~~The I&C associated with the FBVS system is described in Section 9.4.2~~
Fuel Building Ventilation System (FBVS)	~~Maintain Ambient Conditions for EBS and FPCS~~ EBS / FPCS ~~p~~Pump ~~r~~Rooms Heat Removal ~~(Recirculation Coolers)~~ (Figure 7.3-40)	This function is described in Sections 7.3.1.4.4 and 9.4.2. ~~The FBVS has an safety-related function that maintains the room ambient conditions in the extra borating system pump rooms and fuel pool cooling system pump rooms during normal operation, abnormal operation, and postulated accident events (GDC 27, GDC 60, GDC 61).~~	NO	N/A	N/A	~~The I&C associated with the FBV system is described in Section 9.4.2.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Fuel Building Ventilation System (FBVS)	Isolation of FBVS on Containment Isolation (Figure 7.3-62)	This function is described in Sections 7.3.1.4.4 and 9.4.2.3.	NO	N/A	N/A	
Fuel Building Ventilation System (FBVS)	Fuel Pool Area Fuel Handling Accident (Figure 7.3-63)	This function is described in Sections 7.3.1.4.4 and 9.4.2.3.	NO	N/A	N/A	
Fuel Building Ventilation System (FBVS)	Reactor Building Fuel Handling Accident (Figure 7.3-64)	This function is described in Sections 7.3.1.4.4 and 9.4.2.3.	NO	N/A	N/A	

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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Fuel Pool Cooling and Purification System (FPCPS)	~~FPCPS~~ Pump Trip on Low SFP Level (Figure 7.3-41)	This function is described in Sections 7.3.1.4.5 and 9.1.3. ~~The FPCPS has a safety-related function to:~~ 1. ~~Remove decay heat from the spent fuel pool during normal plant operation, outages, AOOs, and PAs.~~ 2. ~~Provide containment isolation by closure of the reactor pool purification supply and return containment isolation valves.~~ 3. ~~Preclude, by design, the drain down of the spent fuel pool (SFP) below its required level to verify that the spent fuel remains covered with water during storage conditions.~~ 4. ~~Provide SFP make-up capability (Seismic Category I water sources, pump, and piping) to compensate for normal SFP evaporation for up to seven days.~~	NO	N/A	N/A	~~The I&C associated with the FPCPS is described in Section 9.1.3.~~

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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
		5. ~~Provide isolation capability of non-safety-related FPCPS piping from the reactor building transfer compartment, the fuel building transfer compartment and cask loading pit (per 10 CFR 50.34(a)(1) or 10 CFR 100.11).~~ ~~The safety-related function to trip the FPC pump on low level verifies that the FPCPS is capable of fulfilling its safety-related function of precluding the drain down of the SFP to eliminate the potential for fuel damage and its consequences.~~				
In-Containment Refueling Water Storage Tank System (IRWST)	IRWST Boundary Isolation for Preserving IRWST Water Inventory Interlock (Figure 7.6-4)	This function is described in Sections 6.3 and 7.6.1.2.6.~~The IRWST has a safety-related function to isolate the IRWST for purposes of preserving the IRWST water inventory to support the safety-related function of controlling core reactivity (via safety injection) by closing the IRWST isolation valves. This preserves IRWST inventory for long term availability of safety injection, given a pipe failure in a connected non-safety-related system.~~	Interdivisional communications is required because an IRWST low level discrete signal is generated in each division, and 2/4 voting logic is used to close IRWST isolation valves in Division 1 and 4.	Discrete	Vote	~~The I&C associated with the IRWST is described in Section 6.3~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Main Control Room Air Conditioning System (CRACS)	Iodine Filtration Train Heater Control (Figure 7.3-42)	This function is described in Sections 6.5.1, 7.3.1.3.2, and 9.4.1.~~The CRACS has an safety-related function to preheat the inlet air in order to reduce the airborne moisture prior to entry into the carbon bed within the filter unit. Carbon filter heaters shut down when the respective inlet or outlet dampers are not fully open. The heaters will turn off if the carbon filtration unit fan stops, the carbon filter inlet isolation damper is not open or the carbon filter outlet isolation damper is not open.~~	NO	N/A	N/A	~~The I&C associated with the CRACS systems is described in Sections 6.5.1 and 9.4.1.~~
Main Control Room Air Conditioning System (CRACS)	Heater Control for Outside Inlet Air (Figure 7.3-43)	This function is described in Sections 6.5.1, 7.3.1.3.2, and 9.4.1.~~The CRACS has an safety-related function to preheat the outside air to verify that the inlet air temperature is not less than 37°F (GDC 19). Inlet air which bypasses the iodine filtration unit is heated by an electric heater for temperature control. Heating of the outside air is performed by multi-stage heaters located in each outside air intake duct.~~	NO	N/A	N/A	~~The I&C associated with the CRACS systems is described in Sections 6.5.1 and 9.4.1.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Main Control Room Air Conditioning System (CRACS)	Pressure Control (Figure 7.3-44)	This function is described in Sections 6.5.1, 7.3.1.3.2, and 9.4.1.~~The CRACS has safety-related function to verify the MCR is maintained at a positive pressure with respect to the ambient air pressure in adjacent areas (GDC 19). Differential pressure sensors sense the pressure difference between the MCR and the pressure in a reference space.~~	NO	N/A	N/A	~~The I&C associated with the CRACS systems is described in Sections 6.5.1 and 9.4.1.~~
Main Control Room Air Conditioning System (CRACS)	Cooler Temperature Control (Figure 7.3-45)	This function is described in Sections 6.5.1, 7.3.1.3.2, and 9.4.1.~~The CRACS has safety-related functions that verifies that the air supply temperature is maintained within the preset temperature range (GDC 19). A control signal is developed when the supply air temperature exceeds a preset temperature set point of 58°F. The control signal is used to adjust cooler outlet SCWS control valves to maintain the air supply temperature.~~	NO	N/A	N/A	~~The I&C associated with the CRACS systems is described in Sections 6.5.1 and 9.4.1.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Main Steam System (MSS)	Steam Generator MSRCV Regulation during Standby Position Control (Figure 7.3-12)	This function is described in Sections 7.3.1.3.3 and 10.3.~~The MSS has a safety-related function supporting the removal of decay heat and other residual heat from the reactor core (GDC 34). The function modulates the MSRCV to its standby control position, so in the event of an overpressure transient the MSRCVs will already be in its required relieving position.~~	NO	N/A	N/A	~~The I&C associated with the MSS is described in Sections 7.3 and 10.3.~~
Main Steam System (MSS)	Steam Generator MSRCV Regulation during Pressure Control (Figure 7.3-12)	This function is described in Sections 7.3.1.3.3 and 10.3.~~The MSS has a safety-related function supporting the removal of decay heat and other residual heat from the reactor core (GDC 34). The function modulates the MSRCV to its required position in order to reduce secondary side pressure of the steam generators during overpressure events.~~	The MSRIV closed position is detected via 2 out of 4 voting (the position switches are associated with Div 1 through 4).	Discrete	Vote	~~The I&C associated with the MSS is described in Sections 7.3 and 10.3.~~

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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Residual Heat Removal System (RHR)	Detection of RHR Connected (Figure 7.6-3)	This function is described in Sections 7.6.1.2.8 and 5.4.7.	This function utilizes interdivisional communication because voting is required using discreet signals that are generated in all four divisions. An RHR RCPB valve isolation discreet signal is generated in each division. The RHR outside containment isolation signal is generated in each division. The LHSI suction isolation discreet signal is generated in each division as well as the LHSI hot leg injection isolation signal.	Discrete	Vote	
Residual Heat Removal System (RHR)	RHR Isolation Valves Interlock (Figure 7.6-11)	This function is described in Sections 7.6.1.2.8 and 5.4.7.	NO	N/A	N/A	

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safeguard Building Controlled-Area Ventilation System (SBVS)	~~SIS/RHRS~~CCWS/ EFWS Pump Rooms Heat Removal (Figure 7.3-46)	This function is described in Sections 7.3.1.3.4 and 9.4.5.~~The SBVS has an safety-related function that maintains ambient conditions for safety related components during normal operation (GDC 60, GDC 61).~~	NO	N/A	N/A	~~The I&C associated with the SBVS system is described in Section 9.4.5.~~
Safeguard Building Controlled-Area Ventilation System (SBVS)	~~SIS/RHRS~~ CCWS/ EFWS Valve Rooms Heat Removal (Figure 7.3-47)	This function is described in Sections 7.3.1.3.4 and 9.4.5.~~The SBVS has an safety-related function that maintains ambient conditions for safety related components during normal operation (GDC60, GDC61).~~	NO	N/A	N/A	~~The I&C associated with the SBVS system is described in Section 9.4.5.~~

All indicated changes are in response to RAI 505, Question 07.01-35

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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply and Recirculation-Exhaust Air Flow Control (Figure 7.3-48)	This function is described in Sections 7.3.1.4.6 and 9.4.6. ~~The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Supply and Recirculation Exhaust Air Flow Control function supports this system safety function by controlling supply, exhaust, and recirculation flow as required to maintain ambient temperature and air quality (via filtration) within applicable limits for safety-related equipment located within the Safeguard Building areas and rooms.~~	NO	N/A	N/A	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply Fan Safe Shut-off (Figure 7.3-49)	This function is described in Sections 7.3.1.4.6 and 9.4.6. ~~The SBVSE has an safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). An inadvertent stopping of the supply fan, due to a spurious system action, may cause the SBVSE for a given division to become inoperable. Therefore, to mitigate the risk of system spurious actions, this function is to be designated as safety-related (IEEE 603).~~	NO	N/A	N/A	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Electrical Division of Safeguard Building Ventilation System (SBVSE)	Recirculation~~/Exhaust~~ Fan Safe Shut-off (Figure 7.3-50)	This function is described in Sections 7.3.1.4.6 and 9.4.6.~~The SBVSE has an safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). An inadvertent stopping of the recirculation/exhaust fan, due to a spurious system action, may cause the SBVSE for a given division to become inoperable. Therefore, to mitigate the risk of system spurious actions, this function is to be designated as safety-related (IEEE 603).~~	NO	N/A	N/A	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Electrical Division of Safeguard Building Ventilation System (SBVSE)	Exhaust Fan Safe Shut-off (Figure 7.3-51)	This function is described in Sections 7.3.1.4.6 and 9.4.6. ~~The SBVSE has an safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). An inadvertent stopping of the exhaust fan, due to a spurious system action, may cause the SBVSE for a given division to become inoperable. Therefore, to mitigate the risk of system spurious actions, this function is to be designated as safety-related (IEEE 603).~~	NO	N/A	N/A	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~
Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply Air Temperature Heater Control (Figure 7.3-52)	This function is described in Sections 7.3.1.4.6 and 9.4.6. ~~The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Supply Air Temperature function supports this system safety function by maintaining supply air temperature (downstream of heaters) as required to maintain ambient temperature within applicable limits for safety-related equipment located within the Safeguard Building areas and rooms.~~	NO	N/A	N/A	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~

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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
~~Electrical Division of Safeguard Building Ventilation System (SBVSE)~~	~~Freeze Protection — Supply Air Temperature~~	~~The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Freeze Protection Supply Air Temperature function supports this system safety function by maintaining supply air temperature (downstream of heaters) as required to maintain ambient temperature within applicable limits for safety-related equipment located within the Safeguard Building areas and rooms.~~	~~NO~~	~~N/A~~	~~N/A~~	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~
Electrical Division of Safeguard Building Ventilation System (SBVSE)	Freeze Protection—~~Heat Tracing~~ (Figure 7.3-53)	This function is described in Sections 7.3.1.4.6 and 9.4.6.~~The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Freeze Protection—Heat Tracing function supports this system safety function by preventing ice build-up on the louver bars (i.e. mitigating the risk of not having available makeup air).~~	NO	N/A	N/A	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply Air Temperature Control for Supply Air Cooling (Figure 7.3-54)	This function is described in Sections 7.3.1.4.6 and 9.4.6. ~~The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Supply Air Temperature Control for Cooling function supports this system safety function by maintaining a constant air temperature as required to maintain ambient temperature within applicable limits for safety-related equipment located within the Safeguard Building areas and rooms.~~	NO	N/A	N/A	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~
~~Electrical Division of Safeguard Building Ventilation System (SBVSE)~~	~~Supply Air Temperature Control for Supply Air Heating~~	~~The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Supply Air Temperature Control for Supply Air Heating function supports this system safety function by maintaining a minimal air temperature as required to maintain ambient temperature within applicable limits for safety-related equipment located within the Safeguard Building areas and rooms.~~	~~NO~~	~~N/A~~	~~N/A~~	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~

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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Electrical Division of Safeguard Building Ventilation System (SBVSE)	Battery Room ~~Temperature~~ Heater Control (Figure 7.3-56)	This function is described in Sections 7.3.1.4.6 and 9.4.6.~~The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Battery Room Temperature Control function supports this system safety function by maintaining battery room ambient temperature within applicable limits.~~	NO	N/A	N/A	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~
Electrical Division of Safeguard Building Ventilation System (SBVSE)	Battery Room Supply Air Temperature Control (Figure 7.3-57)	This function is described in Sections 7.3.1.4.6 and 9.4.6.~~The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Battery Room Supply Air Temperature function supports this system safety function by maintaining battery room ambient temperature within applicable limits.~~	NO	N/A	N/A	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~

**Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Electrical Division of Safeguard Building Ventilation System (SBVSE)	~~Emergency Feedwater~~ EFWS Pump Room Heat Removal (Figure 7.3-58)	This function is described in Sections 7.3.1.4.6 and 9.4.6. ~~The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Emergency Feedwater Pump Room Heat Removal function supports this system safety function by removing heat from the pump room and maintaining room temperature within a temperature band for safety-related equipment.~~	NO	N/A	N/A	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~
Electrical Division of Safeguard Building Ventilation System (SBVSE)	~~Component Cooling Water System~~CCWS Pump Rooms Heat Removal (Figure 7.3-59)	This function is described in Sections 7.3.1.4.6 and 9.4.6. ~~The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Component Cooling Water System Rooms Heat Removal function supports this system safety function by removing heat from the applicable rooms and maintaining room temperature within a temperature band for safety-related equipment.~~	NO	N/A	N/A	~~The I&C associated with the SBVSE is described in Section 9.4.6.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 1 to Train 2 Switchover on Train 1 Low Evaporator Flow Interlock (Figure 7.6-5)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	Train 1 is associated with Div 1 and Train 2 with Div 2. Div 1 and Div 2 are cross connected. When switching between trains (due to system faults - e.g., low evaporator flow) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 2 to Train 1 Switchover on Train 2 Low Evaporator Flow Interlock (Figure 7.6-6)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	Train 1 is associated with Div 1 and Train 2 with Div 2. Div 1 and Div 2 are cross connected. When switching between trains (due to system faults - e.g., low evaporator flow) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to make sure the on-coming train is in ready standby mode and that the appropriate cross-tie valves are in the open position.~~			

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 3 to Train 4 Switchover on Train 3 Low Evaporator Flow Interlock (Figure 7.6-7)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions per (GDC 44).~~	Train 3 is associated with Div 3 and Train 4 with Div 4. Div 3 and Div 4 are cross connected. When switching between trains (due to system faults - e.g., low evaporator flow) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 4 to Train 3 Switchover on Train 4 Low Evaporator Flow Interlock (Figure 7.6-8)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	Train 3 is associated with Div 3 and Train 4 with Div 4. Div 3 and Div 4 are cross connected. When switching between trains (due to system faults - e.g., low evaporator flow) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 1 to Train 2 Switchover on Train 1 Chiller Black Box Internal Fault Interlock (Figure 7.6-5)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	Train 1 is associated with Div 1 and Train 2 with Div 2. Div 1 and Div 2 are cross connected. When switching between trains (due to system faults - chiller black box internal fault) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to provide reasonable assurance that the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 2 to Train 1 Switchover on Train 2 Chiller Black Box Internal Fault Interlock (Figure 7.6-6)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	Train 1 is associated with Div 1 and Train 2 with Div 2. Div 1 and Div 2 are cross connected. When switching between trains (due to system faults - chiller black box internal fault) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to provide reasonable assurance that the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 3 to Train 4 Switchover on Train 3 Chiller Black Box Internal Fault Interlock (Figure 7.6-7)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	Train 3 is associated with Div 3 and Train 4 with Div 4. Div 3 and Div 4 are cross connected. When switching between trains (due to system faults - chiller black box internal fault) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to provide reasonable assurance that the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 4 to Train 3 Switchover on Train 4 Chiller Black Box Internal Fault Interlock (Figure 7.6-8)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	Train 3 is associated with Div 3 and Train 4 with Div 4. Div 3 and Div 4 are cross connected. When switching between trains (due to system faults - chiller black box internal fault) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to provide reasonable assurance that the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 2 to Train 1 Switchover on Loss of ~~Ultimate Heat Sink (LUHS)/~~UHS-CCWS Interlock (Figure 7.6-6)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	Train 1 is associated with Div 1 and Train 2 with Div 2. Div 1 and Div 2 are cross connected. When switching between Trains (due to an external system fault (loss of UHS-CCWS~~ = LUHS~~)) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			

Next File

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 3 to Train 4 Switchover on Loss of ~~Ultimate Heat Sink (LUHS)/~~UHS-CCWS Interlock (Figure 7.6-7)	This function is described in Sections 7.6.1.2.7 and 9.2.8.~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	Train 3 is associated with Div 3 and Train 4 with Div 4. Div 3 and Div 4 are cross connected. When switching between Trains (due to an external system fault (loss of UHS-CCW~~ = LUHS~~)) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 1 to Train 2 Switchover on LOOP Re-start Failure Interlock (Figure 7.6-5)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions per (GDC 44).~~	Train 1 is associated with Div 1 and Train 2 with Div 2. Div 1 and Div 2 are cross connected. When switching between trains (LOOP re-start failure of the previous operating train or with its corresponding EDG) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 2 to Train 1 Switchover on LOOP Re-start Failure Interlock (Figure 7.6-6)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	Train 1 is associated with Div 1 and Train 2 with Div 2. Div 1 and Div 2 are cross connected. When switching between trains (LOOP re-start failure of the previous operating train or with its corresponding EDG) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 3 to Train 4 Switchover on LOOP Re-start Failure Interlock (Figure 7.6-7)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	Train 3 is associated with Div 3 and Train 4 with Div 4. Div 3 and Div 4 are cross connected. When switching between trains (LOOP re-start failure of the previous operating train or with its corresponding EDG) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Chilled Water System (SCWS)	~~SCWS~~ Train 4 to Train 3 Switchover on LOOP Re-start Failure Interlock (Figure 7.6-8)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The automatic switchover function verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	Train 3 is associated with Div 3 and Train 4 with Div 4. Div 3 and Div 4 are cross connected. When switching between trains (LOOP re-start failure of the previous operating train or with its corresponding EDG) an auto-start of the standby train occurs. Interdivisional communication is necessary because a verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.	Discrete	Vote	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
			~~A verification of prerequisites is required to make sure the on-coming train is in standby mode and that the appropriate cross-tie valves are in the open position.~~			
Safety Chilled Water System (SCWS)	SCWS Chiller Evaporator Water Flow Control (Trains 1 and 4) Interlock (Figure 7.6-5 through Figure 7.6-8)	This function is described in Sections 7.6.1.2.7 and 9.2.8. ~~The SCWS has an safety-related function 1) to transfer heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions, 2) component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power, and 3) the capability to isolate components, systems, or piping, if required, so system safety functions are not compromised. The SCWS Chiller Evaporator Water Flow Control function prevents freezing at the evaporator coil and therefore, verifies that the SCWS is capable of fulfilling these safety-related functions (GDC 44).~~	NO	NA	NA	~~The I&C associated with the SCWS is described in Section 9.2.8.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Injection and Residual Heat Removal System (SIS/RHRS)	Automatic RHRS Flow Rate Control (Figure 7.3-60)	This function is described in Sections 5.4.7, 6.3, and 7.3.1.3.6.~~The SIS/RHRS has a safety-related function to provide the RCS RHR in order to reach cold shutdown, refueling modes and to control primary temperature. The function to automatically control the flow rate of the RHRS supports the safety-related function of providing RHR by modulating the bypass control valve ensuring a constant flow rate through the LHSI pump.~~	NO	NA	NA	~~The I&C associated with the SIS/RHRS is described in Section 5.4.7 and 6.3.~~
Safety Injection and Residual Heat Removal System (SIS/RHRS)	Automatic Trip of LHSI Pump (in RHR Mode) on Low ΔPsat Interlock (Figure 7.6-9)	This function is described in Sections 5.4.7, 6.3, and 7.6.1.2.2.~~The SIS/RHRS has a safety-related function to provide the RCS RHR in order to reach cold shutdown, refueling modes and to control primary temperature. The function to automatically trip the LHSI pump upon a low ΔPsat signal supports the safety-related function of providing RHR by maintaining LHSI pump operability by shutting down the pump to prevent pump damage due to inadequate NPSH or unavailability due to steam binding following a failure that results in RCS conditions approaching saturation.~~	Interdivisional communications is required because a low ΔPsat discrete signal is generated in each division, and 2/4 voting logic is used to trip the LHSI pump.	Discrete	Vote	~~The I&C associated with the SIS/RHRS is described in Section 5.4.7 and 6.3.~~

Table 7.1-5—SAS Automatic Safety Function
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System[1]	Function Name[2]	Function Safety Basis[3]	Interdivisional Communications[4]	Type of Data[5]	Signal Selection Type[6]	Comments ~~FSAR Section Referenced~~
Safety Injection and Residual Heat Removal System (SIS/ RHRS)	Automatic Trip of LHSI Pump (in RHR Mode) on Low-Low RCS Loop Level Interlock (Figure 7.6-10)	This function is described in Sections 5.4.7, 6.3, and 7.6.1.2.3.~~The SIS/ RHRS has a safety-related function to provide the RCS RHR in order to reach cold shutdown, refueling modes and to control primary temperature. The function to automatically trip the LHSI pump upon a low RCS loop level signal supports the safety-related function of providing RHR by maintaining LHSI pump operability by shutting down the pump to prevent pump damage or unavailability due to air binding following a failure that results in low RCS loop level.~~	Interdivisional communications is required because a low-low RCS loop level discrete signal is generated in each division, and 2/4 voting logic is used to trip the LHSI pump.	Discrete	Vote	~~The I&C associated with the SIS/ RHRS is described in Section 5.4.7 and 6.3.~~
~~Safety Injection and Residual Heat Removal System (SIS/ RHRS)~~	~~LHSI Valves Actuation Based on RHRS Alignment~~	~~The SIS/RHRS has a safety-related function to provide RCS RHR in order to reach the cold shutdown, refueling modes and to control primary temperature. The function to actuate the LHSI valves supports the safety-related function of RHR by closing the LHSI suction isolation, radial miniflow line check, and tangential miniflow check valves upon RHRS alignment to the RCS thereby preventing diversion of water from the RCS to the IRWST.~~	~~NO~~	~~NA~~	~~NA~~	~~The I&C associated with the SIS/ RHRS is described in Section 5.4.7 and 6.3.~~

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
Systems With Functions in 4 Divisions / Trains								
1	Fuel Building Ventilation System (FBVS)	Isolation of FBVS on Containment Isolation (Figure 7.3-62)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
2	Fuel Building Ventilation System (FBVS)	Fuel Pool Area Handling Accident (Figure 7.3-63	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
3	Fuel Building Ventilation System (FBVS)	Reactor Building Fuel Handling Accident (Figure 7.3-64)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
4	Safety Injection and Residual Heat Removal System (SIS/ RHRS)	RHR Isolation Valves Interlock (Figure 7.6-11)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
5	Electrical Division of Safeguard Building Ventilation System (SBVSE)	SBVSE CCWS Pump Room Heat Removal (Figure 7.3-59)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
6	Component Cooling Water System (CCWS)	CCWS Emergency Temperature Control (Figure 7.3-34)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

**Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
7	Component Cooling Water System (CCWS)	CCWS Emergency Leak Detection (Figure 7.3-35)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
8	Emergency Feedwater System (EFWS)	SG Closed Loop Level Control (Figure 7.3-4)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
9	Emergency Feedwater System (EFWS)	EFWS Pump Flow Protection (Figure 7.3-4)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
10	Essential Service Water Pump Building Ventilation System (ESWPBVS)	ESWPBVS ESWS Pump Rooms Temperature Control (Figure 7.3-38)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
11	Main Steam System (MSS)	Steam Generator MSRCV Regulation during Pressure Control (Figure 7.3-12)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
12	Main Steam System (MSS)	Steam Generator MSRCV Regulation during Standby Position Control (Figure 7.3-12)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
13	Safeguard Building Controlled-Area Ventilation System (SBVS)	SIS/RHRS Pump Rooms Heat Removal (Figure 7.3-46)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
14	Safeguard Building Controlled-Area Ventilation System (SBVS)	CCWS/EFWS Valve Rooms Heat Removal (Figure 7.3-47)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
15	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply and Recirculation Exhaust Air Flow Control (Figure 7.3-48)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
16	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply Fan Safe Shut-off (Figure 7.3-49)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
17	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Recirculation Fan Safe Shut-off (Figure 7.3-50)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
18	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Exhaust Fan Safe Shut-off (Figure 7.3-51)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
19	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply Air Temperature Heater Control (Figure 7.3-52)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
20	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Freeze Protection – Supply Air Temperature (Figure 7.3-53)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
21	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply Air Temperature Control for Supply Air Cooling (Figure 7.3-54)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
22	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Battery Room Heater Control (Figure 7.3-56)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
23	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Battery Room Supply Air Temperature Control (Figure 7.3-57)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
24	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Emergency Feed Water System (EFWS) Pump Room Heat Removal (Figure 7.3-58)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
25	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Component Cooling Water System (CCWS) Pump Room Heat Removal (Figure 7.3-60)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
26	Safety Chilled Water System (SCWS)	SCWS Train 1 to Train 2 Switchover on Train 1 Low Evaporator Flow / Chiller Black Box Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-start Failure (Figure 7.6-5)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the error is alarmed. Loss of one cross-tied train set. One remaining cross-tied train set provides safety function.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant cross-tied train sets	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Two redundant cross-tied train sets	Loss of one division / train. Unable to perform automatic SCWS train switchover function for the faulted cross-tied train set. One remaining cross-tied train set provides the safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
27	Safety Chilled Water System (SCWS)	SCWS Train 2 to Train 1 Switchover on Train 2 Low Evaporator Flow / Chiller Black Box Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-start Failure (Figure 7.6-6)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the error is alarmed. Loss of one cross-tied train set. One remaining cross-tied train set provides safety function.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant cross-tied train sets	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Two redundant cross-tied train sets	Loss of one division / train. Unable to perform automatic SCWS train switchover function for the faulted cross-tied train set. One remaining cross-tied train set provides the safety function.	
28	Safety Chilled Water System (SCWS)	SCWS Train 3 to Train 4 Switchover on Train 3 Low Evaporator Flow / Chiller Black Box Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-start Failure (Figure 7.6-7)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master /Standby CU switchover occurs and the error is alarmed. Loss of one cross-tied train set. One remaining cross-tied train set provides safety function.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant cross-tied train sets	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Two redundant cross-tied train sets	Loss of one division / train. Unable to perform automatic SCWS train switchover function for the faulted cross-tied train set. One remaining cross-tied train set provides the safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
29	Safety Chilled Water System (SCWS)	SCWS Train 4 to Train 3 Switchover on Train 4 Low Evaporator Flow / Chiller Black Box Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-start Failure (Figure 7.6-8)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the error is alarmed. Loss of one cross-tied train set. One remaining cross-tied train set provides safety function.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant cross-tied train sets	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Two redundant cross-tied train sets	Loss of one division / train. Unable to perform automatic SCWS train switchover function for the faulted cross-tied train set. One remaining cross-tied train set provides the safety function.	
30	Safety Injection and Residual Heat Removal System (SIS/ RHRS)	Automatic RHRS Flow Rate Control (Figure 7.3-60)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
Systems With Functions Within 2 Redundant Train Sets								
31	Main Control Room Air Conditioning System (CRACS)	Cooler Temperature Control (Figure 7.3-45)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
32	Annulus Ventilation System (AVS)	Accident Filtration Train Heater Control (Figure 7.3-31)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
33	Annulus Ventilation System (AVS)	Accident Train Switchover (Figure 7.3-32)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
34	Component Cooling Water System (CCWS)	SCWS Condenser Supply Water Flow Control (Figure 7.3-37)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
35	Fuel Building Ventilation System (FBVS)	Safety-Related Room Heater Control (Figure 7.3-39)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
36	Fuel Building Ventilation System (FBVS)	FBVS EBS / FPCS Pump Rooms Heat Removal (Figure 7.3-40)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
37	Fuel Pool Cooling and Purification System (FPCPS)	FPCPS Pump Trip on Low Spent Fuel Pool (SFP) Level (Figure 7.3-41)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
38	Main Control Room Air Conditioning System (CRACS)	Iodine Filtration Train Heater Control (Figure 7.3-42)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
39	Main Control Room Air Conditioning System (CRACS)	Heater Control for Outside Inlet Air (Figure 7.3-43)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
CCWS Switchover Functions								
40	Component Cooling Water System (CCWS)	CCWS Common 1.b Automatic Backup Switchover of Train 1 to Train 2 and Train 2 to Train 1 (Figure 7.3-33)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the error is alarmed. Loss of one train set. One remaining train set provides safety function.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
41	Component Cooling Water System (CCWS)	CCWS Common 2.b Automatic Backup Switchover of Train 3 to Train 4 and Train 4 to Train 3 (Figure 7.3-33)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the error is alarmed. Loss of one train set. One remaining train set provides safety function.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
42	Component Cooling Water System (CCWS)	CCWS Emergency Leak Detection – Switchover Valves Leakage or Failure (Figure 7.3-36)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the error is alarmed. Loss of one train set. One remaining train set provides safety function.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
43	Component Cooling Water System (CCWS)	CCWS Switchover Valves Interlock (Figure 7.6-1)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the error is alarmed. Loss of one train set. One remaining train set provides safety function.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
CCWS RCP Thermal Barrier Interlock Function								

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
44	Component Cooling Water System (CCWS)	CCWS RCP Thermal Barrier Containment Isolation Valve Interlock (Figure 7.6-2)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs and the function remains operable. The function operates differently because a division cannot actuate the devices in another division after the master/standby CU switchover occurs.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train pair. The system is unable to automatically perform the function. The loss of this automatic function will result in multiple RCP trips due to insufficient cooling/ overheating. This will in turn result in a Low RCS Flow Rate RT.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
Systems With Functions Utilizing Voting Logic								
45	In-Containment Refueling Water Storage Tank System (IRWST)	IRWST Boundary Isolation for Preserving IRWST Water Inventory Interlock (Figure 7.6-4)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs in faulted division. Voting logic remains 2/4 in faulted division. Voting logic in other divisions is modified to 2/3.	No effects on the system function
				b) Undetected - Spurious	None	Redundant divisions/ trains	Spurious trigger of one division / train. Voting in other divisions becomes 1/3.	
				c) Undetected - Blocking	None	Redundant divisions/ trains	Loss of one division / train. Voting in other divisions becomes 2/3.	

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
46	Safety Injection and Residual Heat Removal System (SIS/ RHRS)	Automatic Trip of LHSI Pump (in RHR Mode) on Low ΔPsat (Figure 7.6-9)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs in faulted division. Voting logic remains 2/4 in faulted division. Voting logic in other divisions is modified to 2/3.	No effects on the system function
				b) Undetected - Spurious	None	Redundant divisions/ trains	Spurious trigger of one division / train. Voting in other divisions becomes 1/3.	
				c) Undetected - Blocking	None	Redundant divisions/ trains	Loss of one division / train. Voting in other divisions becomes 2/3.	
47	Safety Injection and Residual Heat Removal System (SIS/ RHRS)	Automatic Trip of LHSI Pump (in RHR Mode) on Low Loop Level (Figure 7.6-10)	Master CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Master / Standby CU switchover occurs in faulted division. Voting logic remains 2/4 in faulted division. Voting logic in other divisions is modified to 2/3.	No effects on the system function
				b) Undetected - Spurious	None	Redundant divisions/ trains	Spurious trigger of one division / train. Voting in other divisions becomes 1/3.	
				c) Undetected - Blocking	None	Redundant divisions/ trains	Loss of one division / train. Voting in other divisions becomes 2/3.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
Systems With Functions in 4 Division/Trains								
48	Fuel Building Ventilation System (FBVS)	Isolation of FBVS on Containment Isolation (Figure 7.3-62)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function.	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
49	Fuel Building Ventilation System (FBVS)	Fuel Pool Area Handling Accident (Figure 7.3-63)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function.	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
50	Fuel Building Ventilation System (FBVS)	Reactor Building Fuel Handling Accident (Figure 7.3-64)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function.	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
51	Safety Injection and Residual Heat Removal System (SIS/RHRS)	RHR Isolation Valves Interlock (Figure 7.6-11)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Affected division switches to the standby CU	Three remaining divisions / trains provide safety function.	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
52	Component Cooling Water System (CCWS)	CCWS Emergency Temperature Control (Figure 7.3-34)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
53	Component Cooling Water System (CCWS)	CCWS Emergency Leak Detection (Figure 7.3-35)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
54	Emergency Feedwater System (EFWS)	SG Closed Loop Level Control (Figure 7.3-4)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
55	Emergency Feedwater System (EFWS)	EFWS Pump Flow Protection (Figure 7.3-4)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
56	Essential Service Water Pump Building Ventilation System (ESWPBVS)	ESWPBVS ESWS Pump Rooms Temperature Control (Figure 7.3-38)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
57	Main Control Room Air Conditioning System (CRACS)	Cooler Temperature Control (Figure 7.3-45)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
58	Main Steam System (MSS)	Steam Generator MSRCV Regulation during Pressure Control (Figure 7.3-12)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
59	Main Steam System (MSS)	Steam Generator MSRCV Regulation during Standby Position Control (Figure 7.3-12)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
60	Safeguard Building Controlled-Area Ventilation System (SBVS)	SIS/RHRS Pump Rooms Heat Removal (Figure 7.3-46)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
61	Safeguard Building Controlled-Area Ventilation System (SBVS)	CCWS/EFWS Valve Rooms Heat Removal (Figure 7.3-47)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
62	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply and Recirculation Exhaust Air Flow Control (Figure 7.3-48)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
63	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply Fan Safe Shut-off (Figure 7.3-49)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
64	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Recirculation Fan Safe Shut-off (Figure 7.3-50)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
65	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Exhaust Fan Safe Shut-off (Figure 7.3-51)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
66	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply Air Temperature Heater Control (Figure 7.3-52)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
67	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Freeze Protection – Supply Air Temperature (Figure 7.3-53)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
68	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Supply Air Temperature Control for Supply Air Cooling (Figure 7.3-54)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
69	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Battery Room Heater Control (Figure 7.3-56)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
70	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Battery Room Supply Air Temperature Control (Figure 7.3-57)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
71	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Emergency Feed Water System (EFWS) Pump Room Heat Removal (Figure 7.3-58)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
72	Electrical Division of Safeguard Building Ventilation System (SBVSE)	SBVSE CCWS Pump Room Heat Removal (Figure 7.3-59)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
73	Electrical Division of Safeguard Building Ventilation System (SBVSE)	Component Cooling Water System (CCWS) Pump Room Heat Removal (Figure 7.3-60)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
74	Safety Chilled Water System (SCWS)	SCWS Train 1 to Train 2 Switchover on Train 1 Low Evaporator Flow / Chiller Black Box Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-start Failure (Figure 7.6-5)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Two redundant cross-tied train sets	The error in the faulted division is alarmed. Loss of one cross-tied train set. One remaining cross-tied train set provides safety function.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant cross-tied train sets	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Two redundant cross-tied train sets	Loss of one division / train. Unable to perform automatic SCWS train switchover function for the faulted cross-tied train set. One remaining cross-tied train set provides the safety function.	
75	Safety Chilled Water System (SCWS)	SCWS Train 2 to Train 1 Switchover on Train 2 Low Evaporator Flow / Chiller Black Box Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-start Failure (Figure 7.6-6)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Two redundant cross-tied train sets	The error in the faulted division is alarmed. Loss of one cross-tied train set. One remaining cross-tied train set provides safety function.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant cross-tied train sets	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Two redundant cross-tied train sets	Loss of one division / train. Unable to perform automatic SCWS train switchover function for the faulted cross-tied train set. One remaining cross-tied train set provides the safety function.	

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
76	Safety Chilled Water System (SCWS)	SCWS Train 3 to Train 4 Switchover on Train 3 Low Evaporator Flow / Chiller Black Box Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-start Failure (Figure 7.6-7)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Two redundant cross-tied train sets	The error in the faulted division is alarmed. Loss of one cross-tied train set. One remaining cross-tied train set provides safety function.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant cross-tied train sets	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Two redundant cross-tied train sets	Loss of one division / train. Unable to perform automatic SCWS train switchover function for the faulted cross-tied train set. One remaining cross-tied train set provides the safety function.	
77	Safety Chilled Water System (SCWS)	SCWS Train 4 to Train 3 Switchover on Train 4 Low Evaporator Flow / Chiller Black Box Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-start Failure (Figure 7.6-8)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Two redundant cross-tied train sets	The error in the faulted division is alarmed. Loss of one cross-tied train set. One remaining cross-tied train set provides safety function.	No effects on the system function
				b) Undetected - Spurious	None	Two redundant cross-tied train sets	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Two redundant cross-tied train sets	Loss of one division / train. Unable to perform automatic SCWS train switchover function for the faulted cross-tied train set. One remaining cross-tied train set provides the safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
78	Safety Injection and Residual Heat Removal System (SIS/ RHRS)	Automatic RHRS Flow Rate Control (Figure 7.3-60)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Four redundant divisions/ trains	Three remaining divisions / trains provide safety function	No effects on the system function
				b) Undetected - Spurious	None	Four redundant divisions/ trains	Spurious trigger of one division / train. Three remaining divisions / trains provide safety function.	
				c) Undetected - Blocking	None	Four redundant divisions/ trains	Loss of one division / train. Three remaining divisions / trains provide safety function.	
Systems With Functions Within 2 Redundant Train Sets								
79	Annulus Ventilation System (AVS)	Accident Filtration Train Heater Control (Figure 7.3-31)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Two redundant train sets	Loss of one train set. One remaining train set	One train set remains functional
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train set. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
80	Annulus Ventilation System (AVS)	Accident Train Switchover (Figure 7.3-32)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Two redundant train sets	Loss of one train set. One remaining train set	One train set remains functional
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train set. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
81	Component Cooling Water System (CCWS)	SCWS Condenser Supply Water Flow Control (Figure 7.3-37)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Two redundant train sets	Loss of one train set. One remaining train set	One train set remains functional
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train set. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
82	Fuel Building Ventilation System (FBVS)	Safety-Related Room Heater Control (Figure 7.3-39)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Two redundant train sets	Loss of one train set. One remaining train set	One train set remains functional
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train set. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
83	Fuel Building Ventilation System (FBVS)	FBVS EBS / FPCS Pump Rooms Heat Removal (Figure 7.3-40)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Two redundant train sets	Loss of one train set. One remaining train set	One train set remains functional
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train set. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
84	Fuel Pool Cooling and Purification System (FPCPS)	FPCPS Pump Trip on Low Spent Fuel Pool (SFP) Level (Figure 7.3-41)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Two redundant train sets	Loss of one train set. One remaining train set	One train set remains functional
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train set. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
85	Main Control Room Air Conditioning System (CRACS)	Iodine Filtration Train Heater Control (Figure 7.3-42)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Two redundant train sets	Loss of one train set. One remaining train set	One train set remains functional
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train set. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
86	Main Control Room Air Conditioning System (CRACS)	Heater Control for Outside Inlet Air (Figure 7.3-43)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Two redundant train sets	Loss of one train set. One remaining train set	One train set remains functional
				b) Undetected - Spurious	None	Two redundant train sets	Spurious trigger of one train set. One remaining train set provide safety function.	
				c) Undetected - Blocking	None	Two redundant train sets	Loss of one train set. One remaining train set provides safety function.	
Systems With Functions Utilizing Voting Logic								

All indicated changes are in response to RAI 505, Question 07.01-35

Table 7.1-7—SAS FMEA Results
Sheet 33 of 36

No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
87	In-Containment Refueling Water Storage Tank System (IRWST)	IRWST Boundary Isolation for Preserving IRWST Water Inventory Interlock (Figure 7.6-4)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Redundant divisions/ trains	Loss of Master CU and Standby CU in faulted division. Voting logic in other divisions is modified to 2/3.	No effects on the system function
				b) Undetected - Spurious	None	Redundant divisions/ trains	One division sends a spurious actuation. Voting logic in other divisions becomes 1/3.	
				c) Undetected - Blocking	None	Redundant divisions/ trains	Loss of Master CU and Standby CU in faulted division. Voting logic in other divisions becomes 2/3.	
88	Safety Injection and Residual Heat Removal System (SIS/ RHRS)	Automatic Trip of LHSI Pump (in RHR Mode) on Low ΔPsat (Figure 7.6-9)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Redundant divisions/ trains	Loss of Master CU and Standby CU in faulted division. Voting logic in other divisions is modified to 2/3.	No effects on the system function
				b) Undetected - Spurious	None	Redundant divisions/ trains	One division sends a spurious actuation. Voting logic in other divisions becomes 1/3.	
				c) Undetected - Blocking	None	Redundant divisions/ trains	Loss of Master CU and Standby CU in faulted division. Voting logic in other divisions becomes 2/3.	

Next File

Table 7.1-7—SAS FMEA Results
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No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
89	Safety Injection and Residual Heat Removal System (SIS/RHRS)	Automatic Trip of LHSI Pump (in RHR Mode) on Low Loop Level (Figure 7.6-10)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Redundant divisions/trains	Loss of Master CU and Standby CU in faulted division. Voting logic in other divisions is modified to 2/3.	No effects on the system function
				b) Undetected - Spurious	None	Redundant divisions/trains	One division sends a spurious actuation. Voting logic in other divisions becomes 1/3.	
				c) Undetected - Blocking	None	Redundant divisions/trains	Loss of Master CU and Standby CU in faulted division. Voting logic in other divisions becomes 2/3.	
				CCWS Switchover Functions				
90	Component Cooling Water System (CCWS)	CCWS Common 1.b Automatic Backup Switchover of Train 1 to Train 2 and Train 2 to Train 1 (Figure 7.3-33)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Failed sensor marked invalid; two redundant train pairs.	Unable to automatically perform switchover function in the faulted division. Loss of 1 train pair	A second pair serves its associated heat loads. Adequate cooling is provided by the second train pair.
				b) Undetected - Spurious	None	Two redundant trains pairs	Unable to automatically perform switchover function in the faulted division. Loss of 1 train pair	
				c) Undetected - Blocking	None	Two redundant trains pairs	Unable to automatically perform switchover function in the faulted division. Loss of 1 train pair	

Table 7.1-7—SAS FMEA Results
Sheet 35 of 36

No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
91	Component Cooling Water System (CCWS)	CCWS Common 2.b Automatic Backup Switchover of Train 3 to Train 4 and Train 4 to Train 3 (Figure 7.3-33)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Failed sensor marked invalid; two redundant train pairs.	Unable to automatically perform switchover function in the faulted division. Loss of 1 train pair	A second pair serves its associated heat loads. Adequate cooling is provided by the second train pair
				b) Undetected - Spurious	None	Two redundant trains pairs	Unable to automatically perform switchover function in the faulted division. Loss of 1 train pair	
				c) Undetected - Blocking	None	Two redundant trains pairs	Unable to automatically perform switchover function in the faulted division. Loss of 1 train pair	
92	Component Cooling Water System (CCWS)	CCWS Emergency Leak Detection – Switchover Valves Leakage or Failure (Figure 7.3-36)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Failed sensor marked invalid; two redundant train pairs.	Unable to automatically perform switchover function in the faulted division. Loss of 1 train pair	A second pair serves its associated heat loads. Adequate cooling is provided by the second train pair
				b) Undetected - Spurious	None	Two redundant trains pairs	Unable to automatically perform switchover function in the faulted division. Loss of 1 train pair	
				c) Undetected - Blocking	None	Two redundant trains pairs	Unable to automatically perform switchover function in the faulted division. Loss of 1 train pair	

Table 7.1-7—SAS FMEA Results
Sheet 36 of 36

No	System	SAS Function	Name of Sensor, Functional Unit, or Equipment (2)	Failure Mode (1)	Method of Detection	Inherent Compensating Provision	Effect on the SAS Function	Comments
93	Component Cooling Water System (CCWS)	CCWS Switchover Valves Interlock (Figure 7.6-1)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Failed sensor marked invalid; two redundant train pairs.	Unable to automatically perform switchover function in the faulted division. Loss of 1 train pair	A second pair serves its associated heat loads. Adequate cooling is provided by the second train pair
				b) Undetected - Spurious	None	Two redundant trains pairs	Unable to automatically perform switchover function in the faulted division. Loss of 1 train pair	
				c) Undetected - Blocking	None	Two redundant trains pairs	Unable to automatically perform switchover function in the faulted division. Loss of 1 train pair	
				CCWS RCP Thermal Barrier Interlock Function				
94	Component Cooling Water System (CCWS)	CCWS RCP Thermal Barrier Containment Isolation Valve Interlock (Figure 7.6-2)	Loss of 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Low RCS Flow Rate RT	Unable to automatically perform the function	The loss of this automatic function will result in multiple RCP trips due to insufficient cooling / overheating. This will in turn result in a Low RCS Flow Rate RT.
				b) Undetected - Spurious	None	Low RCS Flow Rate RT	Unable to automatically perform the function	
				c) Undetected - Blocking	None	Low RCS Flow Rate RT	Unable to automatically perform the function	
				All SAS Functions				
95	All systems for which SAS performs a function.	All SAS functions	Standby CU in 1 Division	a) Detected Failure	TXS inherent or engineered fault detection mechanism	Master/Standby CU configuration.	None - Master CU in affected division remains functional	No effects on the system function
				b) Undetected - Spurious	None	Master/Standby CU configuration.	None - Master CU in affected division remains functional	
				c) Undetected - Blocking	None	Master/Standby CU configuration.	None - Master CU in affected division remains functional	

Notes:

1. Failure Mode – The failure cause is not identified in the system-level analysis. The failure modes are selected to bound the results of any specific failure cause. Specific failure causes can be identified only after specific equipment is selected and application software is developed.
2. This FMEA has been analyzed for loss of a CU and loss of a division failure. These types of failures encompass any single failure within a division, (i.e. loss of a sensor, hardwired logic failure / fault).

Figure 7.1-1—Chapter 7 Symbol Legend
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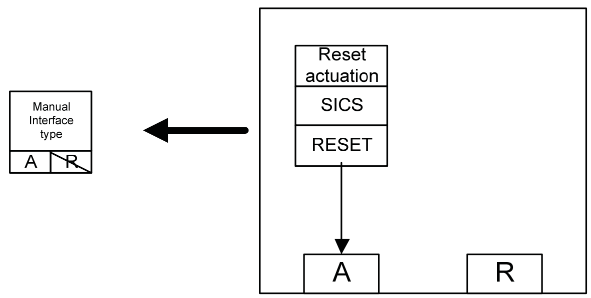
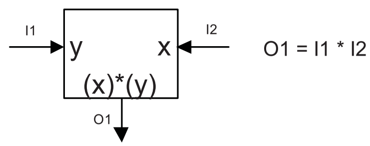
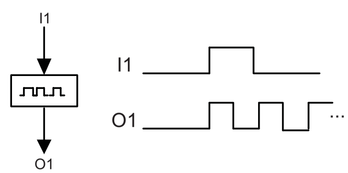
	Manual Interface Block Actuate Only
	Multiplication Function
	Continuous Pulse Function

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Actuation orders are sent from the PS to the PACS priority module associated with each actuator required for the function. The exception to this is the turbine trip function. The actuation order is transmitted via hardwired connections to the turbine-generator instrumentation and control system (TG I&C) and does not involve the PACS. The connections between the PS and TG I&C are shown in Figure 7.1-27. The PS and the PACS are discussed in Section 7.1. The TG I&C system is described in Section 10.2.

The safety automation system (SAS) performs closed loop automatic controls of certain ESF systems following their actuation by the PS. These controls are described in ~~Section 7.3.1.2~~Section 7.3.1.3 ~~with their associated actuation functions~~. The SAS also performs functions for essential auxiliary support (EAS) systems. These are systems that provide support to the ESF systems. These controls are described in Section 7.3.1.4. The list of functions performed by the SAS is described in Table 7.1-5. The other functions described in Section 7.3 are done by the PS. The SAS is described in Section 7.1.

The capability for manual system-level ESF actuations is available to the operator through the safety information and control system (SICS) in the MCR. These manual actuations are acquired by the ALUs in the PS and combined with the automatic actuation logic. The manual actuations are described with the corresponding automatic function in Section 7.3.1.2.

The capability for component-level control of ESF system actuators is available to the operator on both the PICS and the SICS in the MCR. Commands from the PICS are processed by the PAS and sent to the PACS for prioritization. Commands from the SICS are sent directly to the PACS for prioritization. SICS is the safety-related actuation path and PICS is the non-safety-related actuation path. The manual system-level ESF actuation sequence is shown in Figure 7.3-1 (Sheet 2). The manual actuations are described with the corresponding automatic function in Sections 7.3.1.2.

For an extra borating system (EBS) malfunction event, the component-level controls on SICS are credited to terminate EBS. For the failure of small lines carrying primary coolant outside the Reactor Containment Building (Section 15.0.0.3.5), component-level controls from SICS are credited to isolate the failed line. Operator actions credited in mitigating accidents are addressed in Section 15.0.0.3.7.

The capability for manual reset of sense and command ESF actuation outputs is provided on the SICS. Not all ESF actuations require a manual reset. There are cases where a sense and command output is cleared after the PS determines that the initiating condition has cleared. The reset functionality related to each ESF actuation is described in Section 7.3.1.2. Further description of the operation of the SICS is presented in Section 7.1.

actions to manipulate individual components as may be necessary to follow plant operating procedures.

The functional logic for hydrogen mixing dampers opening is shown in Figure 7.3-30—Hydrogen Mixing Dampers Opening.

7.3.1.3 Engineered Safety Features Control Functional Descriptions

7.3.1.3.1 Annulus Ventilation System

Accident Filtration Train Heater Control

The annulus ventilation system (AVS) has a safety-related function to maintain capability of the iodine absorbers to remove iodine from the annulus exhaust air. The heaters are used to limit the relative humidity to a maximum of 70 percent when the AVS accident trains are in operation (RG 1.52 and ASME N509-89). The functional logic is shown in Figure 7.3-31—AVS Accident Filtration Train Heater Control.

Accident Train Switchover

The AVS has a safety-related function to maintain a negative pressure and provide exhaust filtration (GDC 16, GDC 43, Containment Leakage Testing per 10 CFR 50 Appendix J, and NRC RG 1.52 Rev 3). In case of a failure during accident operation of an operating accident filtration train, and a negative pressure is not being maintained in the annulus, operation is switched to the non-operating accident filtration train to maintain a negative pressure and provide exhaust filtration. The functional logic is shown in Figure 7.3-32—AVS Accident Train Switchover.

7.3.1.3.2 Emergency Feedwater System

Emergency Feedwater System SG Level Control

The EFWS has a safety-related function to remove residual heat via the steam generators (SG). The EFWS SG Level control function controls the level within the SG once EFWS actuation function is initiated by the PS. This function is described further in Section 7.3.1.2.2. The functional logic is shown in Figure 7.3-4—EFWS SG Level Control and Pump Flow Protection.

Emergency Feedwater System Pump Flow Protection

The EFWS has a safety-related function to remove residual heat via the steam generators (SG). The EFWS Pump Flow Protection function controls the flow from the EFW pumps to provide protection against an overflow condition. This function is described further in Section 7.3.1.2.2. The functional logic is shown in Figure 7.3-4.

7.3.1.3.3 Main Control Room Air Conditioning System

Iodine Filtration Train Heater Control

The main control room air conditioning system (CRACS) has an safety-related function to preheat the inlet air in order to reduce the airborne moisture prior to entry into the carbon bed within the filter unit. Carbon filter heaters shut down when the respective inlet or outlet dampers are not fully open. The heaters will turn off if the carbon filtration unit fan stops, the carbon filter inlet isolation damper is not open or the carbon filter outlet isolation damper is not open. The functional logic is shown in Figure 7.3-42—CRACS Iodine Filtration Train Heater Control.

Heater Control for Outside Air Inlet

The CRACS has an safety-related function to preheat the outside air to verify that the inlet air temperature is not less than 37°F (GDC 19). Inlet air that bypasses the iodine filtration unit is heated by an electric heater for temperature control. Heating of the outside air is performed by multi-stage heaters located in each outside air intake duct. The functional logic is shown in Figure 7.3-43—CRACS Heater Control for Outside Inlet Air.

Pressure Control

The CRACS has safety-related function to verify the MCR is maintained at a positive pressure with respect to the ambient air pressure in adjacent areas (GDC 19). Differential pressure sensors sense the pressure difference between the MCR and the pressure in a reference areas. The functional logic is shown in Figure 7.3-44—CRACS Pressure Control.

Cooler Temperature Control

The CRACS has safety-related functions that verify that the air supply temperature is maintained within the preset temperature range (GDC 19). A control signal is developed when the supply air temperature exceeds a preset temperature set point of 58°F. The control signal is used to adjust cooler outlet SCWS control valves to maintain the air supply temperature. The functional logic is shown in Figure 7.3-45—CRACS Cooler Temperature Control.

7.3.1.3.4 Main Steam System

Steam Generator MSRCV Regulation during Standby Position Control

The main steam system (MSS) has a safety-related function supporting the removal of decay heat and other residual heat from the reactor core (GDC 34). The function modulates the main steam relief control valve (MSRCV) to its standby control position, so in the event of an overpressure transient the MSRCVs will already be in its

required relieving position. This function is described further in Section 7.3.1.2.5. The functional logic is shown in Figure 7.3-12—MSRCV Control

Steam Generator MSRCV Regulation during Pressure Control

The MSS has a safety-related function supporting the removal of decay heat and other residual heat from the reactor core (GDC 34). The function modulates the MSRCV to its required position in order to reduce secondary side pressure of the SGs during overpressure events. This function is described further in Section 7.3.1.2.5. The functional logic is shown in Figure 7.3-12—MSRCV Control.

7.3.1.3.5 Safeguard Building Controlled-Area Ventilation System

SIS / RHRS Pump Rooms Heat Removal

The safeguard building controlled-area ventilation system (SBVS) has a safety-related function that maintains ambient conditions for safety-related components (GDC 60, GDC 61). The functional logic is shown in Figure 7.3-46—SBVS SIS / RHRS Pump Rooms Heat Removal.

CCWS / EFWS Valve Rooms Heat Removal

The SBVS has a safety-related function that maintains ambient conditions for safety-related components (GDC 60, GDC 61). The functional logic is shown in Figure 7.3-47—SBVS CCWS / EFWS Valve Rooms Heat Removal.

7.3.1.3.6 Safety Injection System/Residual Heat Removal System

Automatic RHRS Flow Rate Control

The SIS/RHRS has a safety-related function to provide RCS decay heat removal to reach cold shutdown, refueling modes and to control primary temperature. The function to automatically control the flow rate of the RHRS supports the safety-related function of providing decay heat removal by modulating the bypass control valve ensuring a constant flow rate through the LHSI heat exchanger. The functional logic is shown in Figure 7.3-60—SIS / RHRS Automatic RHRS Flow Rate Control.

7.3.1.4 Essential Auxiliary Support Controls Functional Descriptions

7.3.1.4.1 Component Cooling Water System

Common 1.b Automatic Backup Switchover of Train 1 to Train 2

The component cooling water system (CCWS) has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function to perform an automatic switchover from Train 1 to Train 2 verifies that the CCWS is capable of fulfilling its safety-related function to remove heat from safety-related

components on the CCWS Common 1.a and 1.b headers. The functional logic is shown in Figure 7.3-33—CCWS Common 1.b Automatic Backup Switchover of Train 1 to Train 2 and Train 2 to 1.

Common 1.b Automatic Backup Switchover of Train 2 to 1

The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function to perform an automatic switchover from Train 2 to Train 1 verifies that the CCWS is capable of fulfilling its safety-related function to remove heat from safety-related components on the CCWS Common 1.a and 1.b headers. The functional logic is shown in Figure 7.3-33—CCWS Common 1.b Automatic Backup Switchover of Train 1 to Train 2 and Train 2 to 1.

Common 2.b Automatic Backup Switchover of Train 3 to 4

The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function to perform an automatic switchover from Train 3 to Train 4 verifies that the CCWS is capable of fulfilling its safety-related function to remove heat from safety-related components on the CCWS Common 2.a and 2.b headers. The functional logic is shown in Figure 7.3-33—CCWS Common 1.b Automatic Backup Switchover of Train 1 to Train 2 and Train 2 to 1.

Common 2.b Automatic Backup Switchover of Train 4 to 3

The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function to perform an automatic switchover from Train 4 to Train 3 verifies that the CCWS is capable of fulfilling its safety-related function to remove heat from safety-related components on the CCWS Common 2.a and 2.b headers. The functional logic is shown in Figure 7.3-33—CCWS Common 1.b Automatic Backup Switchover of Train 1 to Train 2 and Train 2 to 1.

Emergency Temperature Control

The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function to control the CCWS heat exchanger (HX) outlet temperature is required to maintain the temperature of the cooling water within its limits. This verifies that the CCWS is capable of fulfilling its safety-related function to remove heat from safety-related components. The functional logic is shown in Figure 7.3-34—CCWS Emergency Temperature Control.

Emergency Leak Detection

The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function for emergency leak detection maintains the required cooling water inventory that supports the safety-related function to remove heat using indications to detect leaks and isolate them (GDC 44).

The functional logic is shown in Figure 7.3-35—CCWS Emergency Leak Detection.

Emergency Leak Detection - Switchover Valves Leakage or Failure

The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The safety-related function for switchover valve leakage or failure isolates the CCWS trains from their common headers so that each train is able to provide their corresponding LHSI HX with the required flow for heat removal. Removing heat from the LHSI HX is a safety-related function. The functional logic is shown in Figure 7.3-36—CCWS Emergency Leak Detection - Switchover Valves Leakage or Failure.

SCWS Condenser Supply Water Flow Control

The CCWS has a safety-related function that controls CCWS flow to the SCWS condenser and provides a heat sink for heat rejection, therefore providing reasonable assurance that the SCWS is capable of fulfilling its safety-related functions (GDC 44). The functional logic is shown in Figure 7.3-37—SCWS Condenser Supply Water Flow Control.

7.3.1.4.2 Essential Service Water System

Automatic ESWS Actuation from CCWS Start

The essential service water system (ESWS) has a safety-related function to remove heat from safety-related components (GDC 44). The Automatic ESWS Actuation from CCWS Start function starts the corresponding train ESWS pump so that the SCWS is capable of fulfilling its safety-related function to remove heat from the corresponding CCWS train. The functional logic is shown in Figure 7.3-33—CCWS Common 1.b Automatic Backup Switchover of Train 1 to Train 2 and Train 2 to 1.

7.3.1.4.3 Essential Service Water Pump Building Ventilation System

ESWS Pump Rooms Temperature Control

The essential service water pump building ventilation system (ESWPBVS) has a safety-related function that maintains the ESWS pump room temperature when the ESWS pumps are operating at rated load and the outside air is at maximum site design ambient temperature (GDC 4, GDC 17). The functional logic is shown in Figure 7.3-38—ESWPBVS ESWS Pump Rooms Temperature Control.

7.3.1.4.4 Fuel Building Ventilation System

Safety-Related Rooms Heater Control

The fuel building ventilation system (FBVS) has an safety-related function that maintains the temperature in the boron rooms and surrounding extra borating system

tanks to prevent crystallization in extra borating system piping (GDC 27, GDC 60, GDC 61). The functional logic is shown in Figure 7.3-39—FBVS Safety-Related Rooms Heater Control.

EBS / FPCS Pump Rooms Heater Removal

The FBVS has an safety-related function that maintains the room ambient conditions in the extra borating system pump rooms and fuel pool cooling system pump rooms (GDC 27, GDC 60, GDC 61). The functional logic is shown in Figure 7.3-40—FBVS EBS / FPCS Pump Rooms Heat Removal.

Isolation of FBVS on Containment Isolation

The FBVS has a safety-related function to automatically isolate the NABVS supply and exhaust ducts in the event of a containment isolation signal. The functional logic is shown in Figure 7.3-62—Isolation of FBVS on Containment Isolation.

Isolation of FBVS on Fuel Pool Area Fuel Handling Accident

The FBVS has a safety-related function to automatically isolate the supply and exhaust air to the fuel handling hall to mitigate the consequences of a fuel handling accident in the hall. The functional logic is shown in Figure 7.3-63—Fuel Pool Area Fuel Handling Accident.

Isolation of Reactor Building on Fuel Handling Accident

The FBVS has a safety-related function to automatically isolate the supply airflow to the room in front of the emergency airlock in order to mitigate the consequences of a fuel handling accident in the Reactor Building. The functional logic is shown in Figure 7.3-64—Reactor Building Fuel Handling Accident.

7.3.1.4.5 Fuel Pool Cooling and Purification System

FPCPS Pump Trip on Low SFP Level

The safety-related function to trip the FPC pump on low level so that the FPCPS is capable of fulfilling its safety-related function of precluding the drain down of the SFP to eliminate the potential for fuel damage and its consequences. The functional logic is shown in Figure 7.3-41—FPCPS Pump Trip on Low SFP Level.

7.3.1.4.6 Electrical Division of Safeguard Building Ventilation System

Supply and Recirculation-Exhaust Air Flow Control

The safeguard building ventilation system (electrical) (SBVSE) has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Supply and

Recirculation-Exhaust Air Flow Control function supports this system safety function by controlling supply, exhaust, and recirculation air flow as required to maintain ambient temperature and air quality (via filtration) within applicable limits for safety-related equipment located within the Safeguard Building areas and rooms. The functional logic is shown in Figure 7.3-48—SBVSE Supply and Recirculation-Exhaust Air Flow Control.

Supply Fan Safe Shut-Off

The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). An inadvertent stopping of the supply fan, due to a spurious system action, may cause the SBVSE for a given division to become inoperable. Therefore, to mitigate the risk of system spurious actions, this function is to be designated as safety-related (IEEE 603). The functional logic is shown in Figure 7.3-49—SBVSE Supply Fan Safe Shut-Off.

Recirculation Fan Safe Shut-Off

The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). An inadvertent stopping of the recirculation/exhaust fan, due to a spurious system action, may cause the SBVSE for a given division to become inoperable. Therefore, to mitigate the risk of system spurious actions, this function is to be designated as safety-related (IEEE 603). The functional logic is shown in Figure 7.3-50—SBVSE Recirculation Fan Safe Shut-Off.

Exhaust Fan Safe Shut-Off

The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). An inadvertent stopping of the exhaust fan, due to a spurious system action, may cause the SBVSE for a given division to become inoperable. Therefore, to mitigate the risk of system spurious actions, this function is to be designated as safety-related (IEEE 603). The functional logic is shown in Figure 7.3-51—SBVSE Exhaust Fan Safe Shut-Off.

Supply Air Temperature Heater Control

The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Supply Air Temperature Heater Control function supports this system safety function by maintaining supply air temperature (downstream of heaters) as required to maintain ambient temperature within applicable limits for safety-related equipment located within the Safeguard Building areas and rooms. The functional

logic is shown in Figure 7.3-52—SBVSE Supply Air Temperature Heater Control.

Freeze Protection

The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Freeze Protection function supports this system safety function by preventing ice buildup on the louver bars (specifically, mitigating the risk of not having available makeup air). The functional logic is shown in Figure 7.3-53—SBVSE Freeze Protection.

Supply Air Temperature Control for Supply Air Cooling

The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Supply Air Temperature Control for Supply Air Cooling function supports this system safety function by maintaining a constant air temperature, as required, to maintain ambient temperature within applicable limits for safety-related equipment located within the Safeguard Building areas and rooms. The functional logic is shown in Figure 7.3-54—SBVSE Supply Air Temperature Control for Supply Air Cooling.

Battery Room Heater Control

The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Battery Room Temperature Control function supports this system safety function by maintaining battery room ambient temperature within applicable limits. The functional logic is shown in Figure 7.3-56—SBVSE Battery Room Heater Control.

Battery Room Supply Air Temperature Control

The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The Battery Room Supply Air Temperature Control function supports this system safety function by maintaining battery room ambient temperature within applicable limits. The functional logic is shown in Figure 7.3-57—SBVSE Battery Room Supply Air Temperature Control.

EFWS Pump Room Heat Removal

The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The EFWS Heat Removal function supports this system safety function by removing heat from the pump room and maintaining room temperature within a

temperature band for safety-related equipment. The functional logic is shown in Figure 7.3-58—SBVSE EFWS Pump Room Heat Removal.

CCWS Pump Room Heat Removal

The SBVSE has a safety-related function to ventilate and maintain acceptable ambient temperature in the Safeguard Building areas and rooms ventilated by the system (GDC 4, GDC 17). The CCWS Pump Room Heat Removal function supports this system safety function by removing heat from the applicable rooms and maintaining room temperature within a temperature band for safety-related equipment. The functional logic is shown in Figure 7.3-59—SBVSE CCWS Pump Room Heat Removal.

7.3.2 Analysis

7.3.2.1 Design Basis Information

Clause 4 of IEEE Std 603-1998 (Reference 5) specifies the information used to establish the design basis for safety-related systems. This section discusses design basis information for the ESF actuation functions. These functions are performed automatically by the PS and the PACS, and manually through the SICS in conjunction with the PS and PACS. The design basis information related to the equipment of these safety-related systems, environmental conditions in which they must function, and methods used to determine their reliability are discussed in Section 7.1.

The design basis information below pertains to the requirements placed on the ESF actuation functions and the variables monitored to initiate ESF systems.

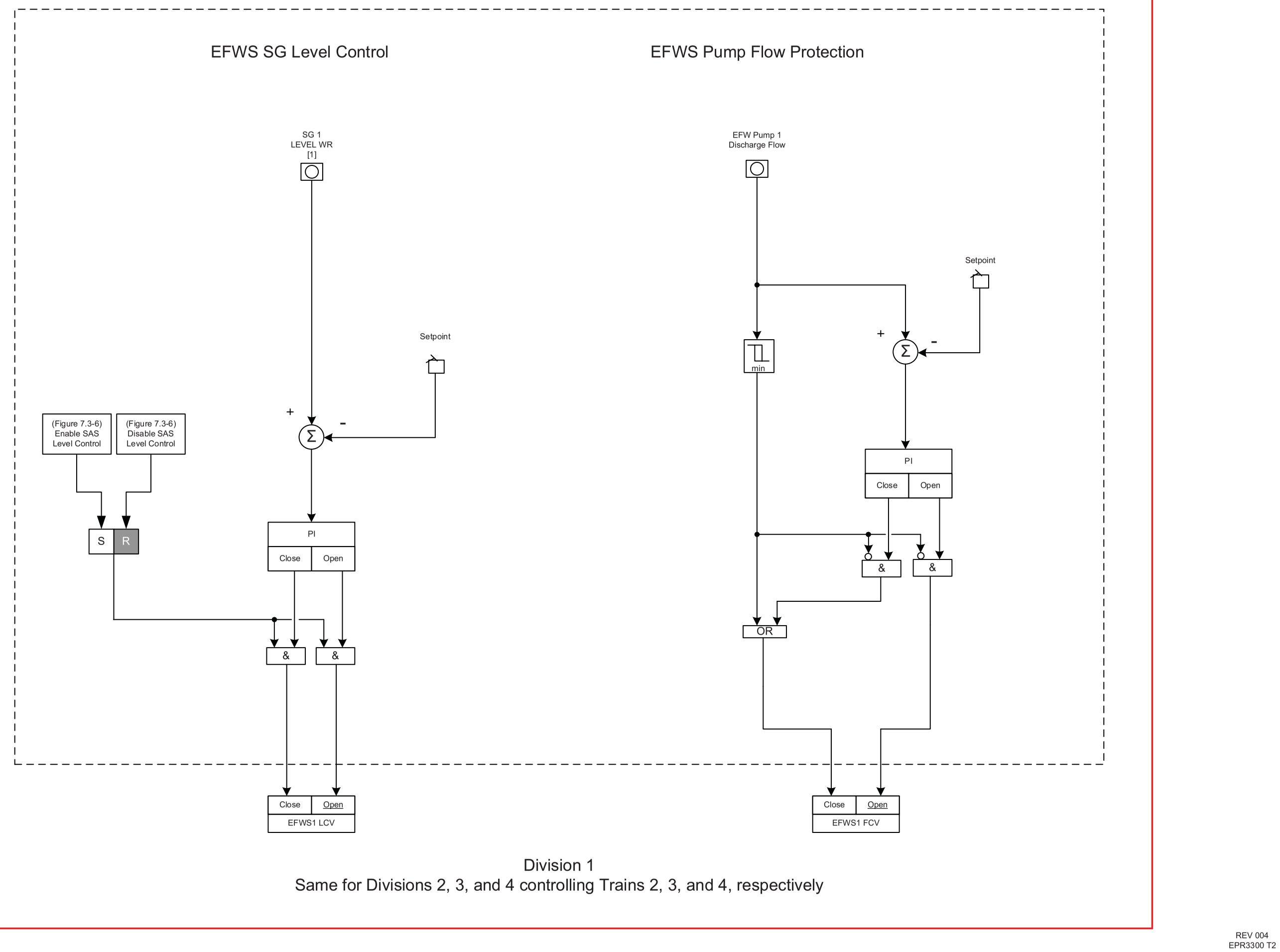
7.3.2.1.1 Design Basis: Applicable Events (Clause 4.a and 4.b of IEEE Std 603-1998)

The AOOs and PAs requiring protective action are analyzed in Chapter 15. The initiating events analyzed are listed in Table 15.0-1. The initial conditions analyzed for each event are presented in Table 15.0-6. Correlation between each event and specific ESF actuation functions is found in Table 15.0-10.

7.3.2.1.2 Design Basis: Permissive Conditions for Operating Bypasses (Clause 4.c of IEEE Std 603-1998)

The operating bypasses applicable to each ESF actuation function are identified in Section 7.3.1.2.1 through Section 7.3.1.2.18. Each operating bypass (permissive signal) is described in Section 7.2.1.3. The functional logic used to generate each operating bypass is also specified in Section 7.2.1.3.

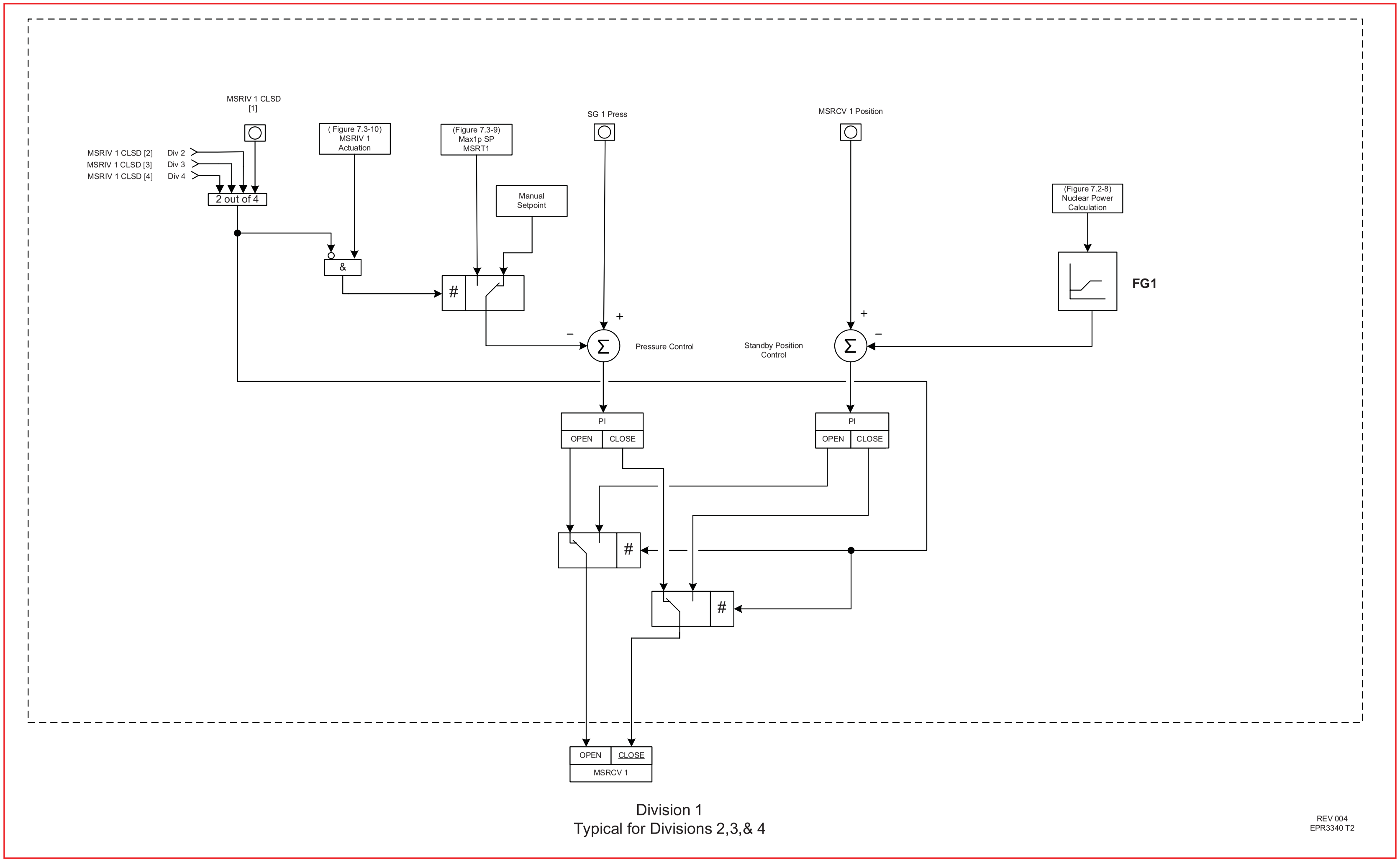
Figure 7.3-4—EFWS SG Level Control and Pump Flow Protection



Division 1
Same for Divisions 2, 3, and 4 controlling Trains 2, 3, and 4, respectively

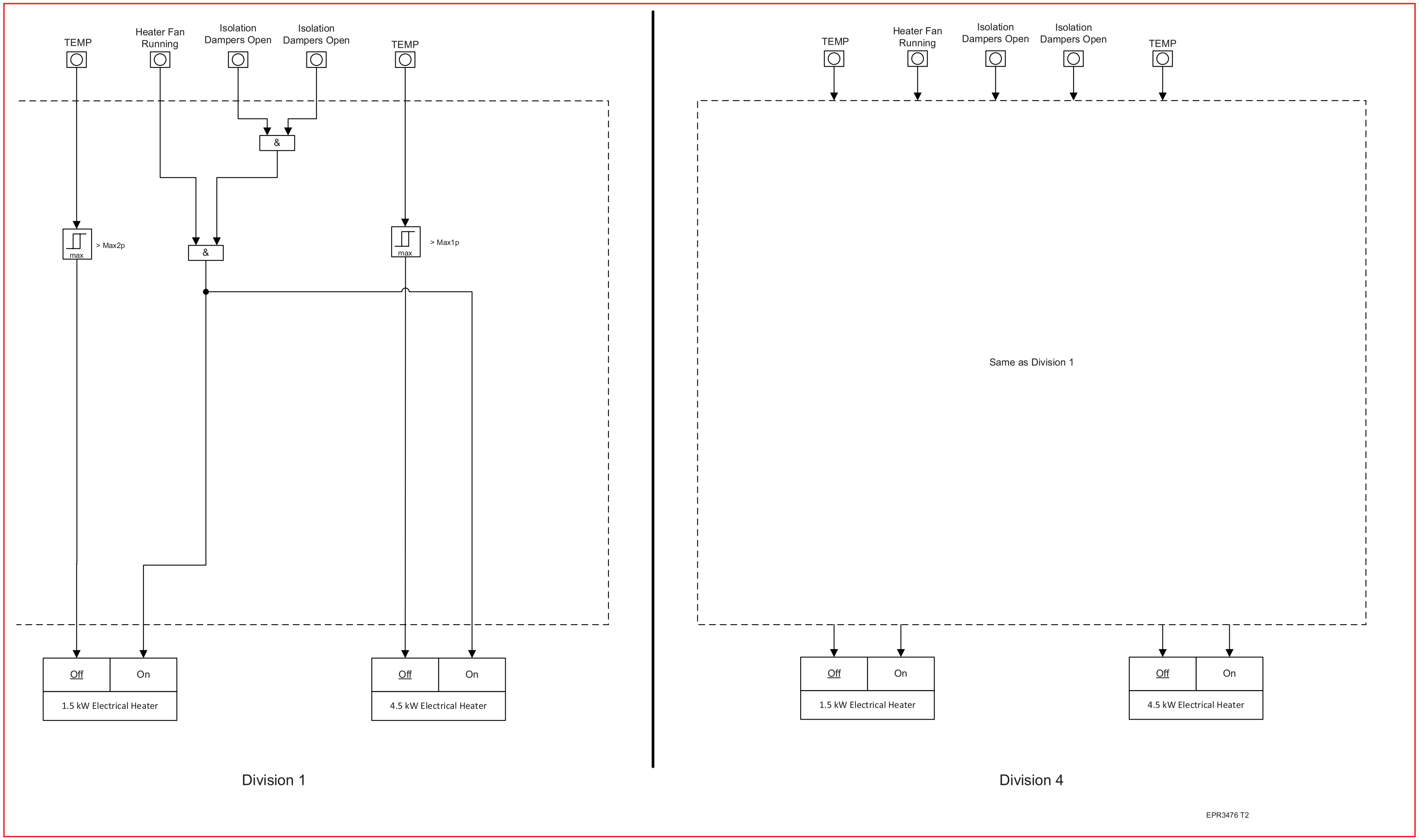
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-12—MSRCV Control



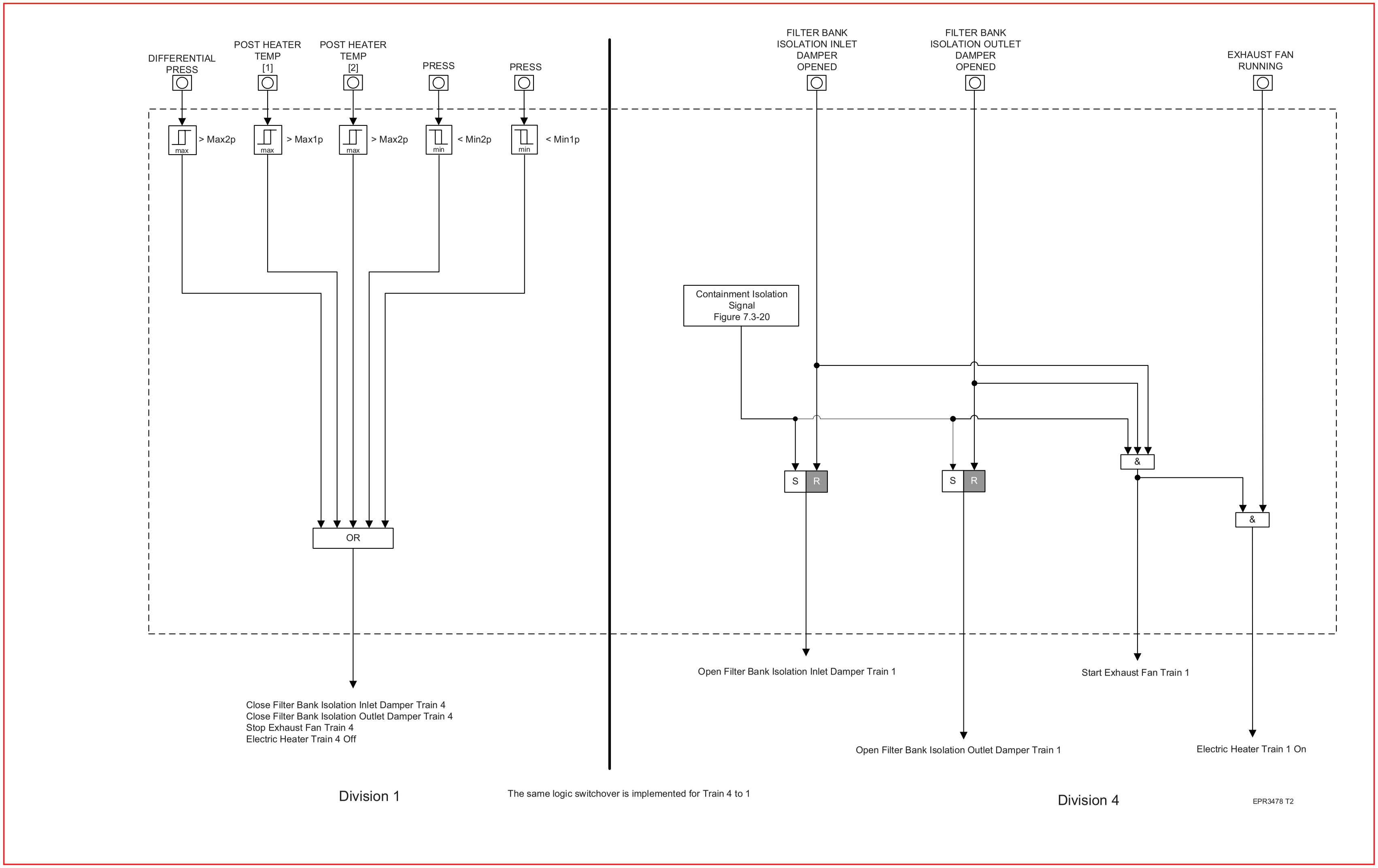
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-31—AVS Accident Filtration Train Heater Control



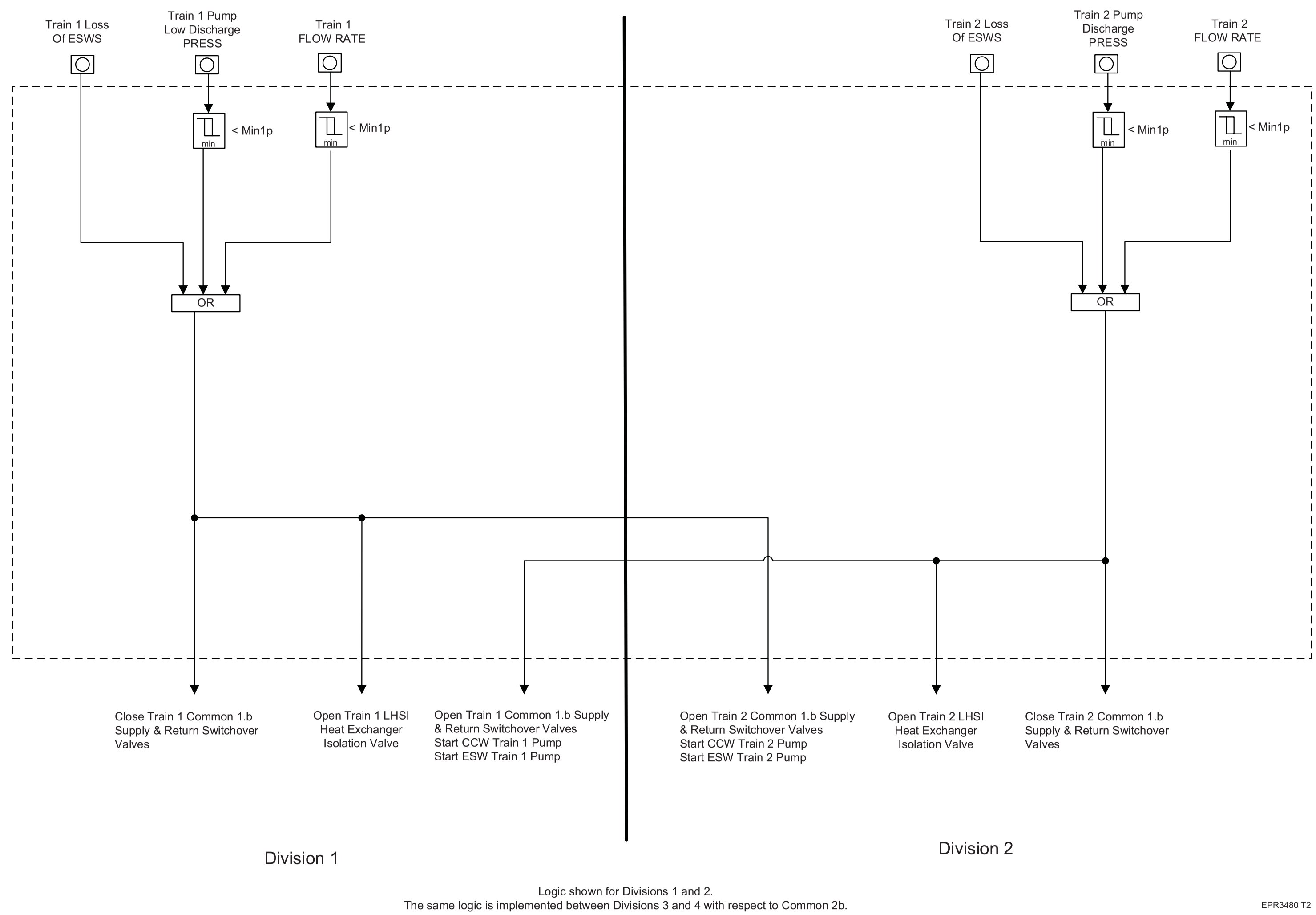
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-32—AVS Accident Train Switchover



All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-33—CCWS Common 1.b Automatic Backup Switchover of Train 1 to Train 2 and Train 2 to 1



All indicated changes are in response to RAI 505, Question 07.01-35

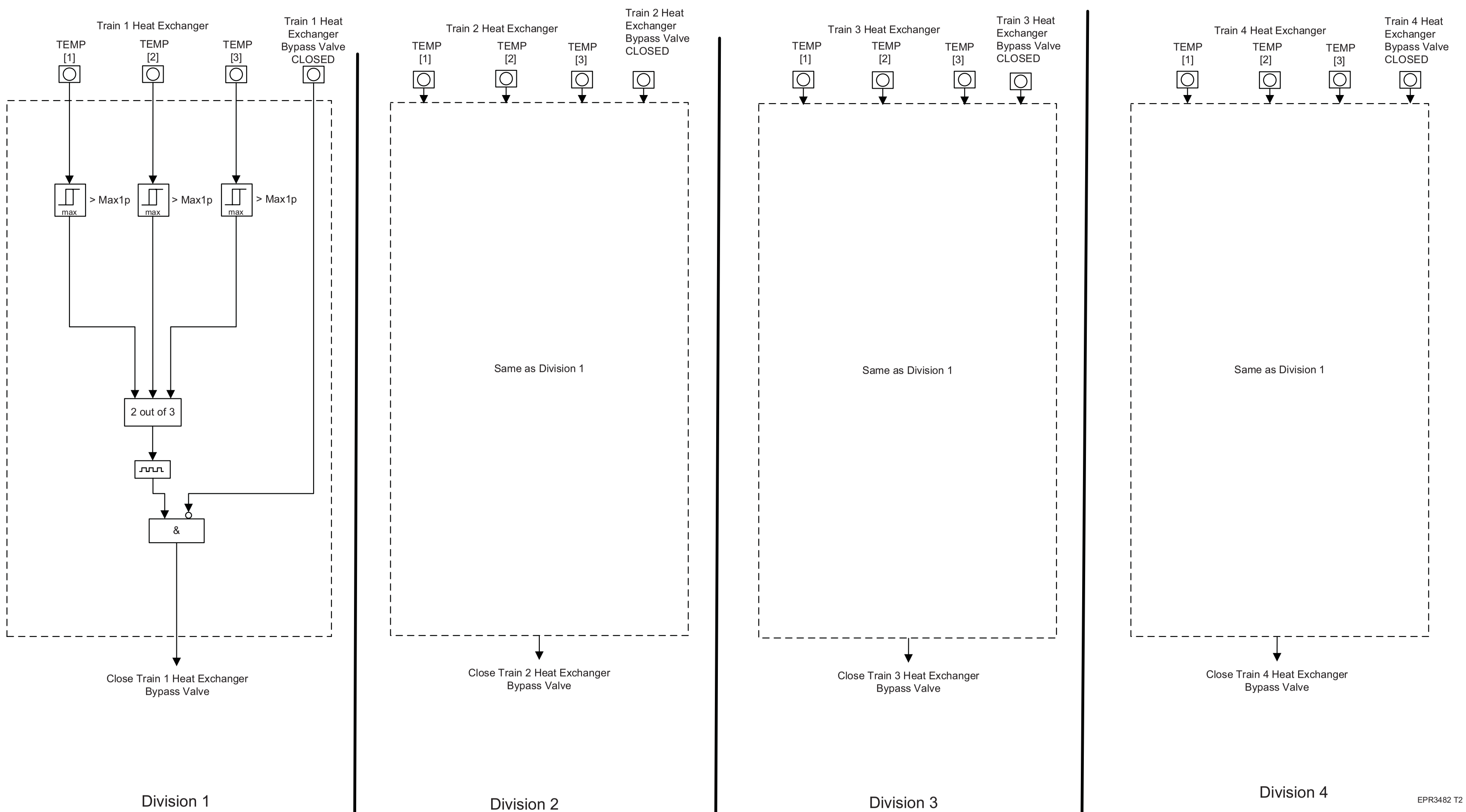
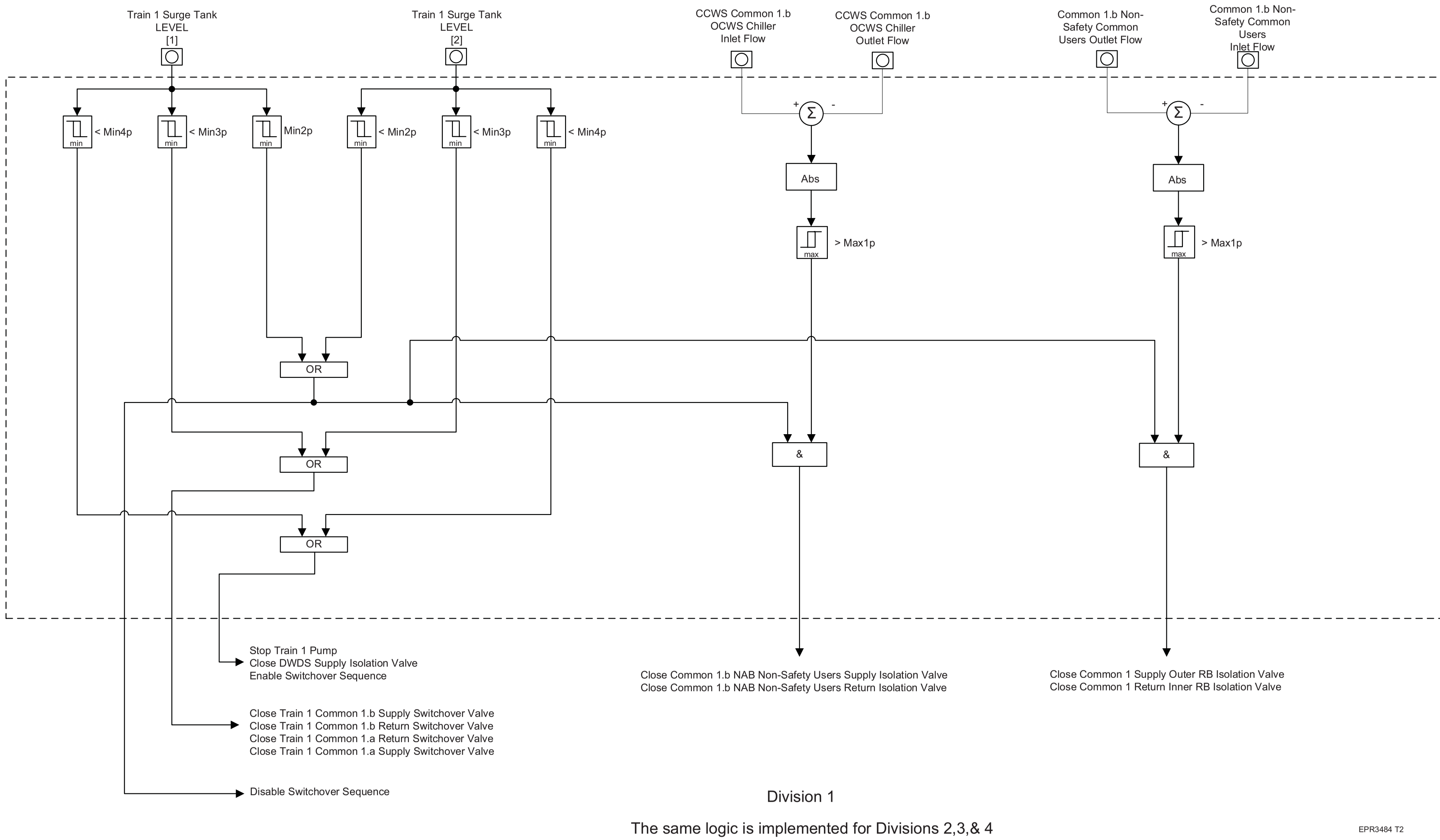


Figure 7.3-34—CCWS Emergency Temperature Control

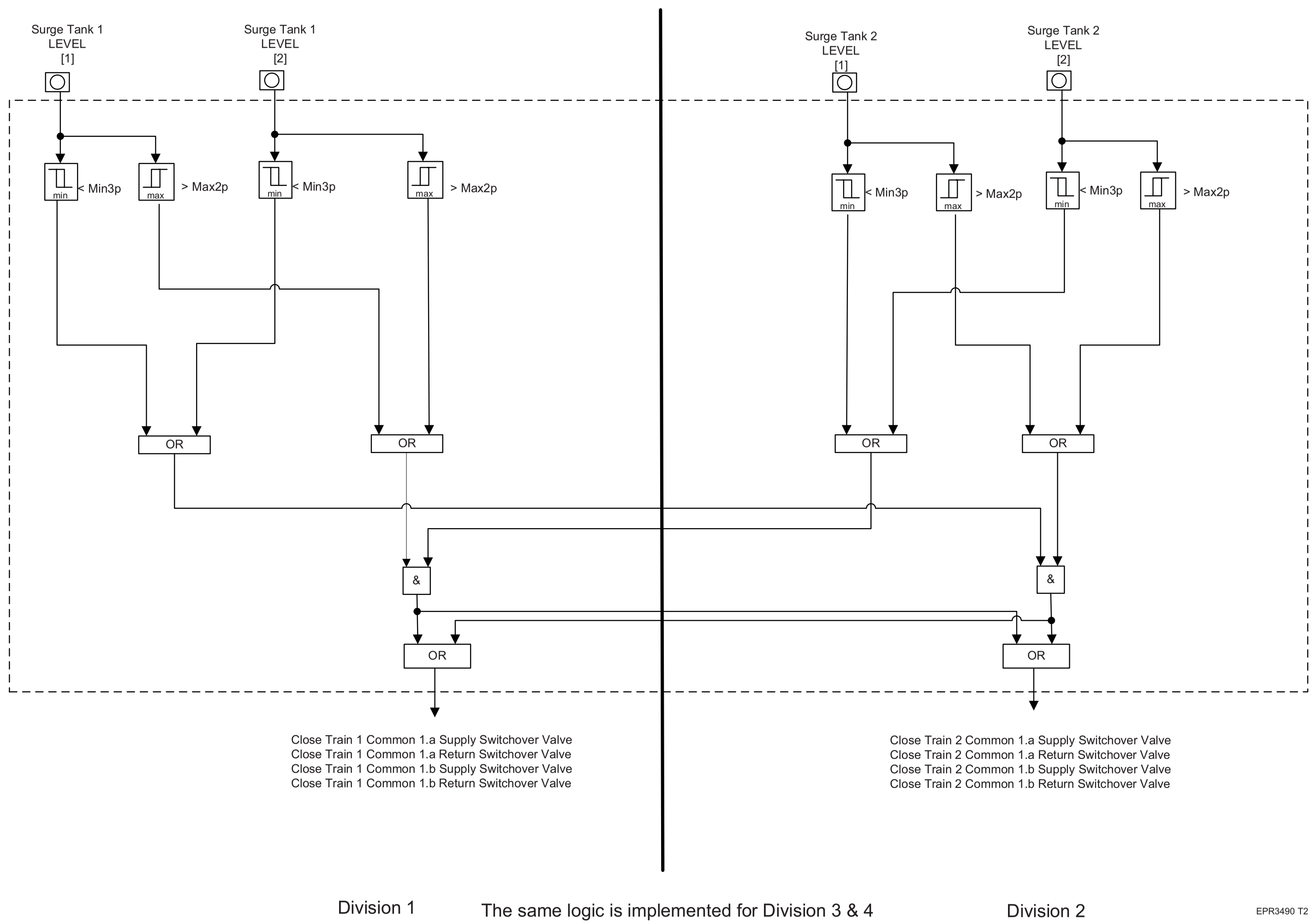
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-35—CCWS Emergency Leak Detection



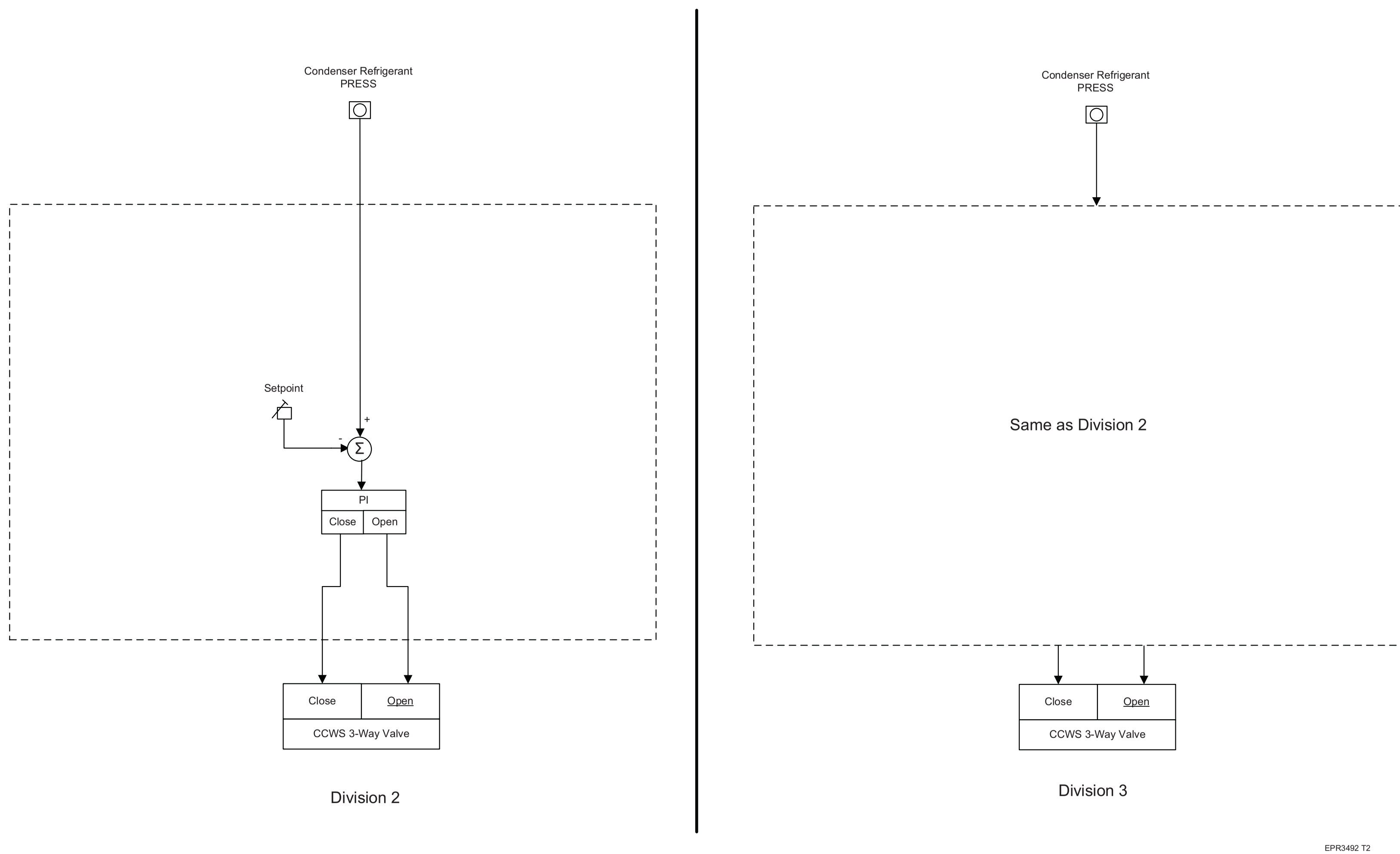
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-36—CCWS Emergency Leak Detection - Switchover Valves Leakage or Failure



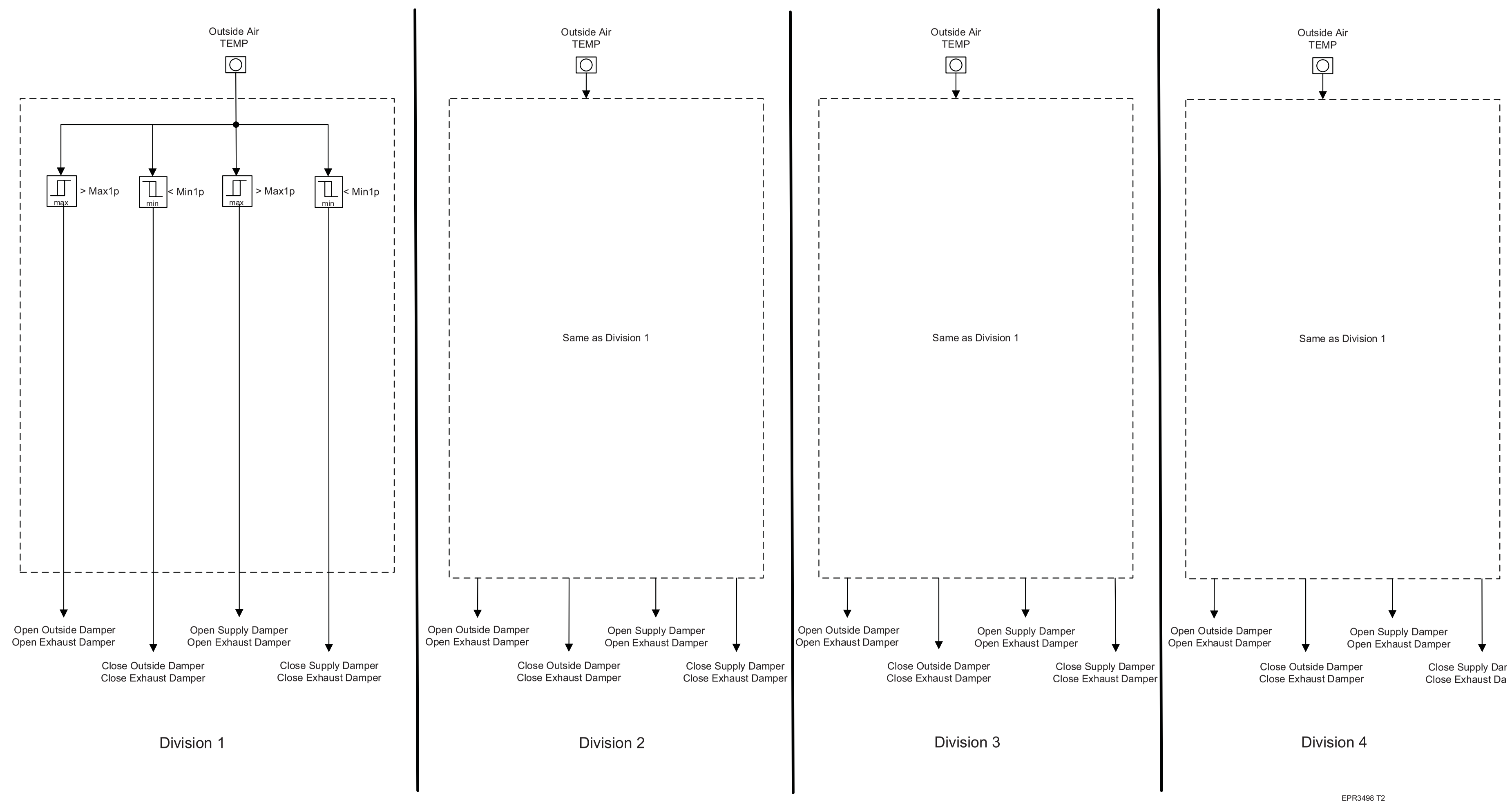
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-37—SCWS Condenser Supply Water Flow Control



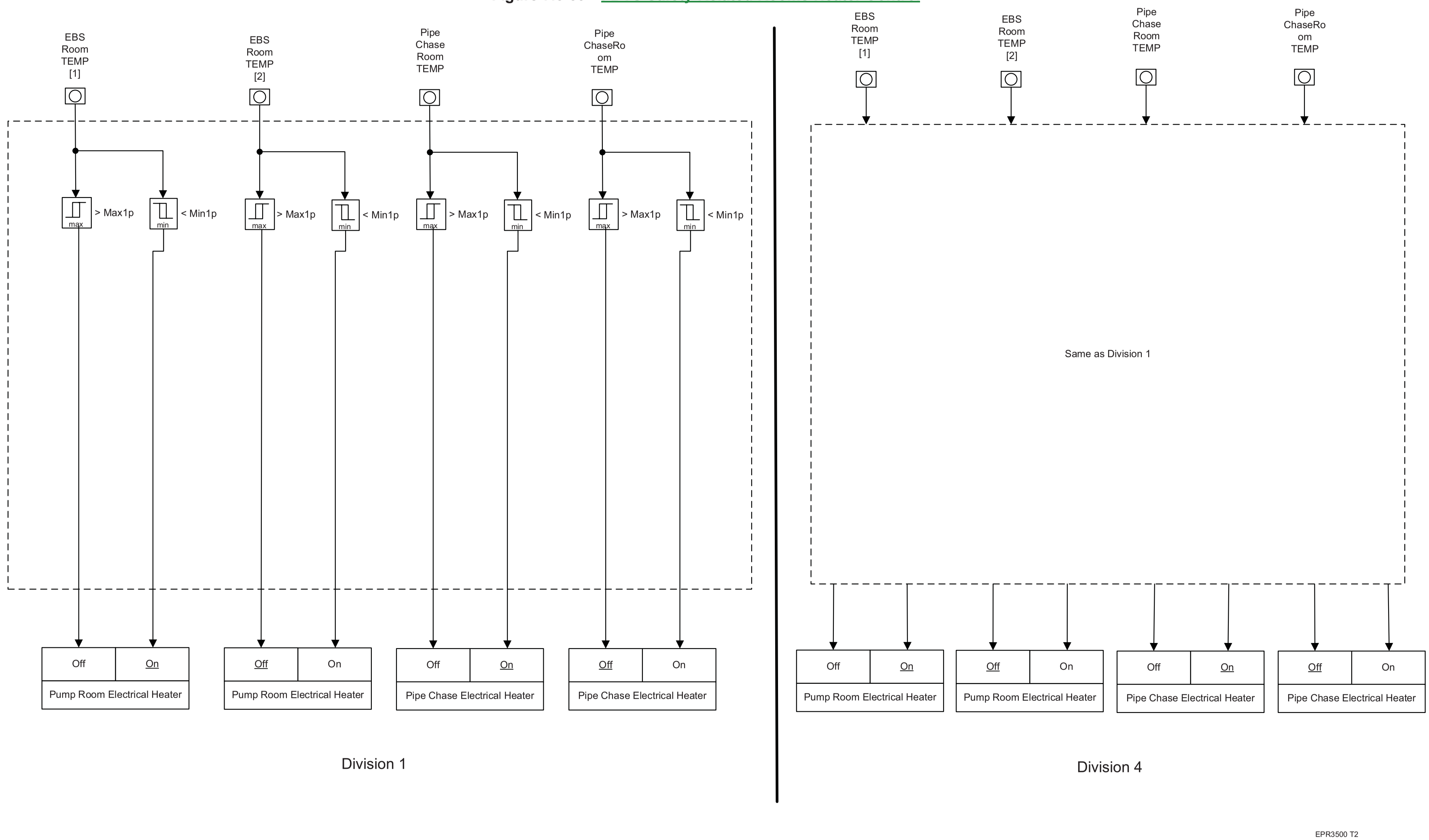
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-38—ESWPBVS ESWS Pump Rooms Temperature Control



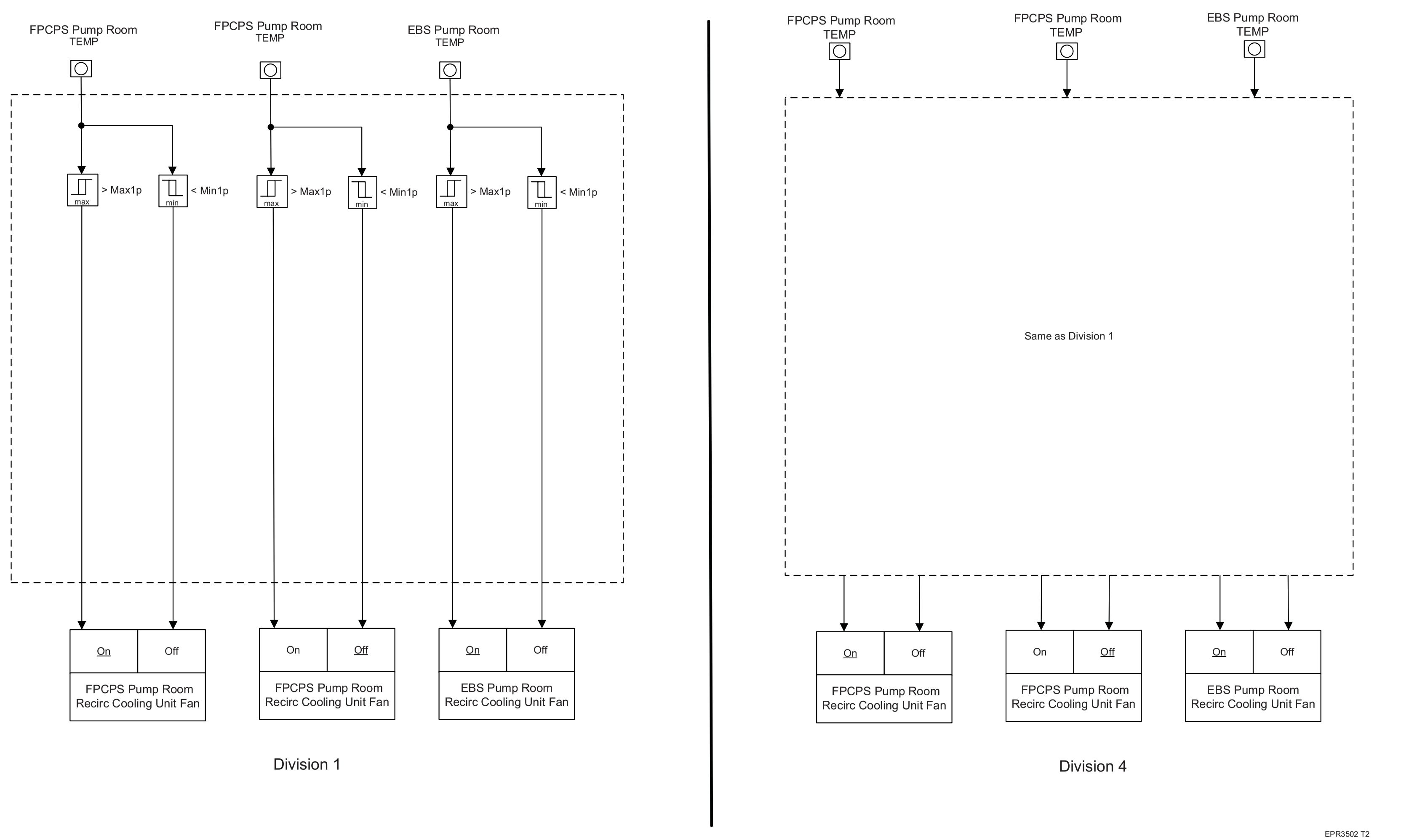
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-39—FBVS Safety-Related Rooms Heater Control



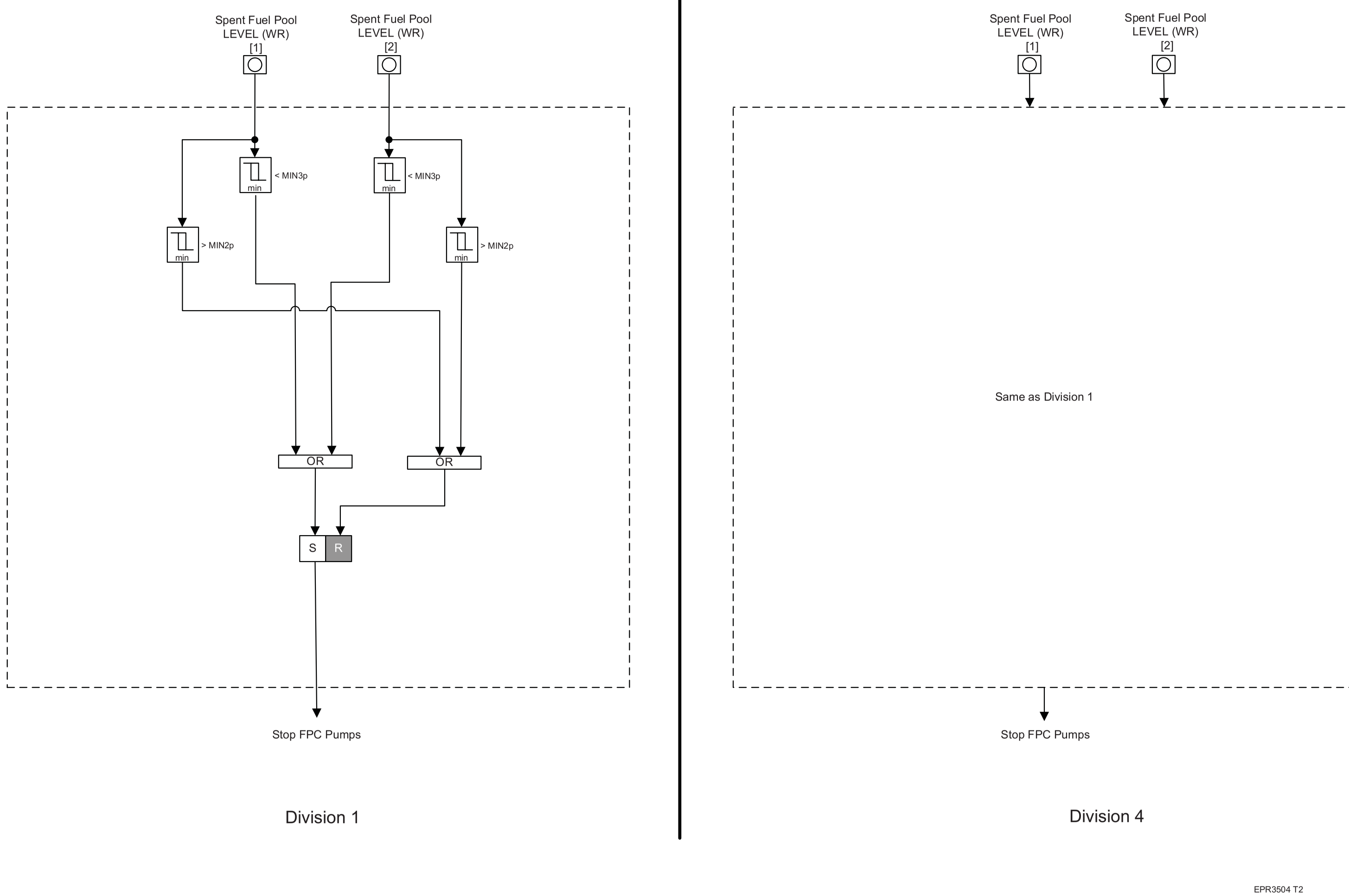
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-40—FBVS EBS / FPCS Pump Rooms Heat Removal



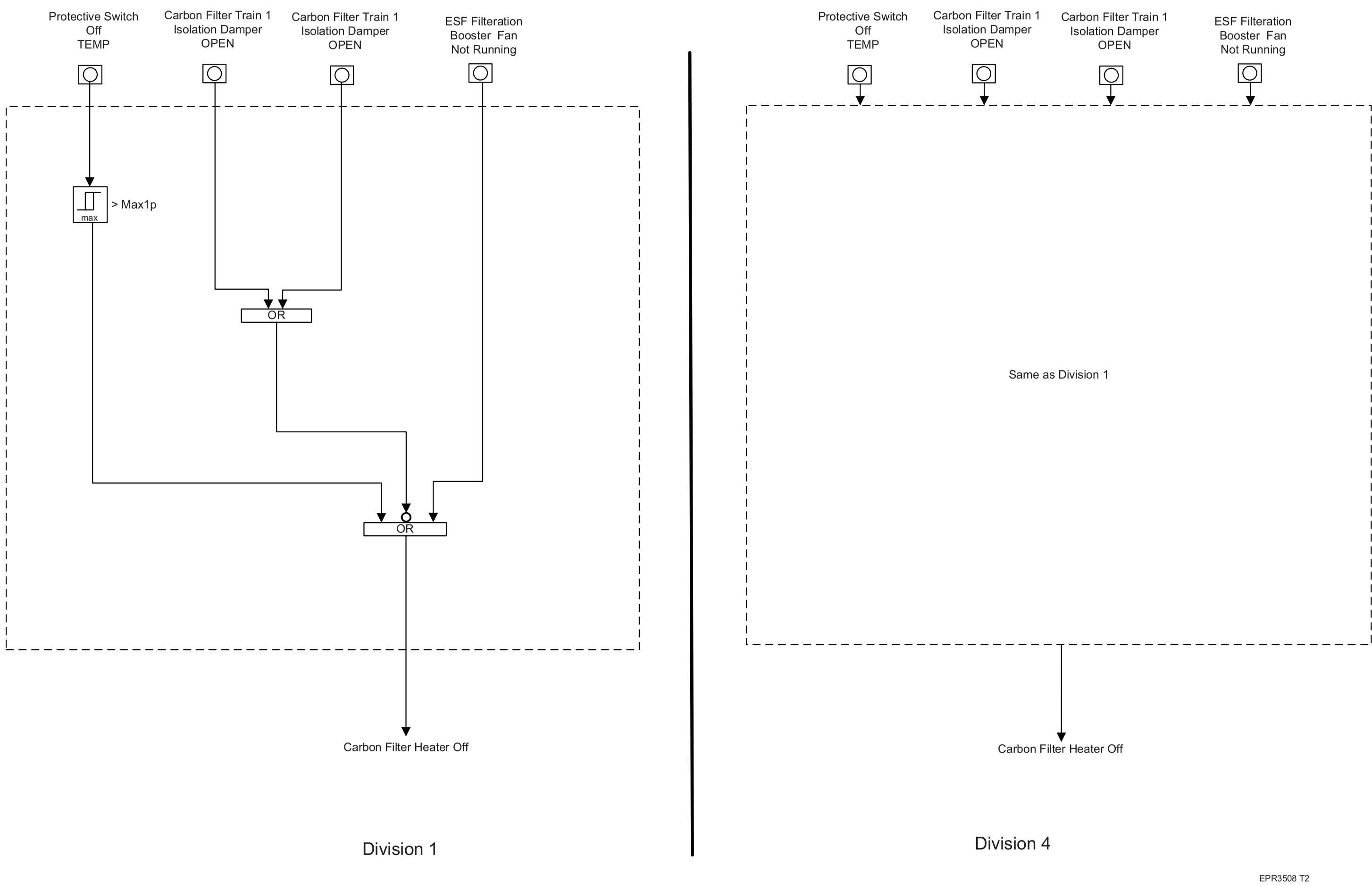
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-41—FPCPS Pump Trip on Low SFP Level



All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-42—CRACS Iodine Filtration Train Heater Control



All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-43—CRACS Heater Control for Outside Inlet Air

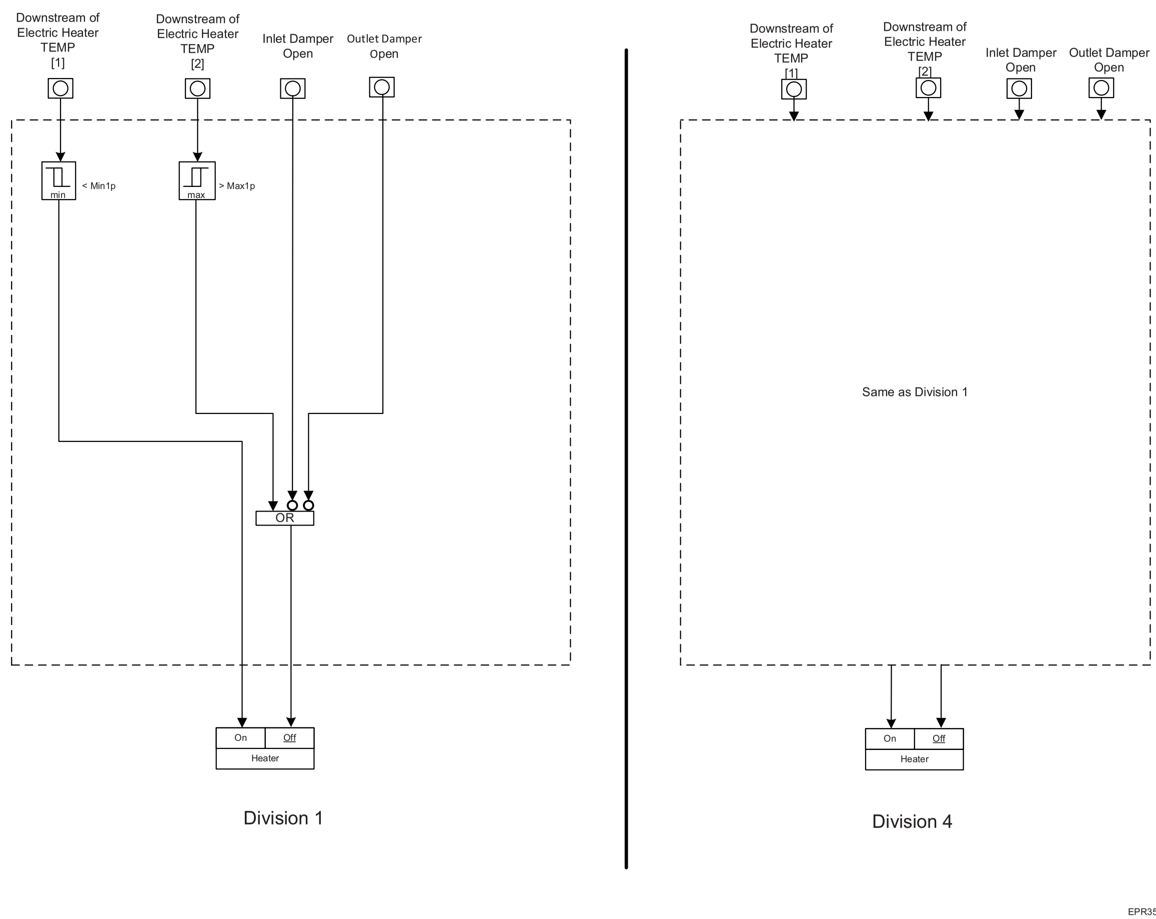
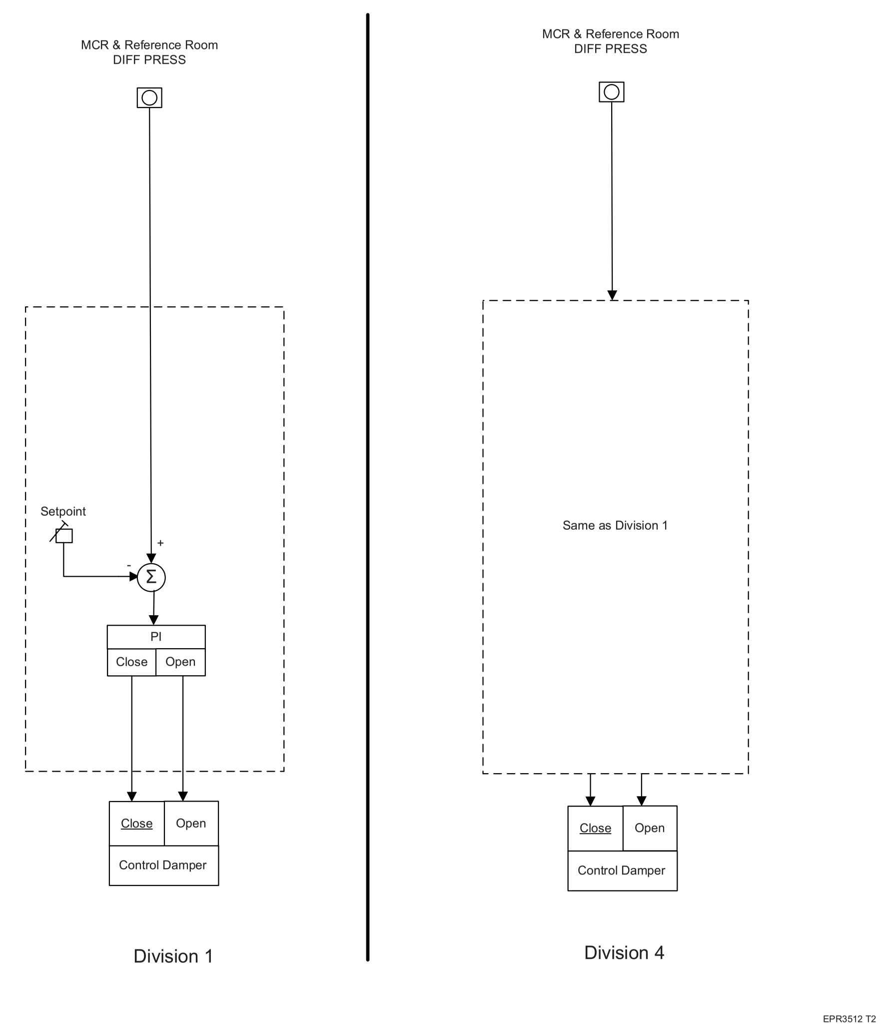


Figure 7.3-44—<u>CRACS Pressure Control</u>



All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-45—CRACS Cooler Temperature Control

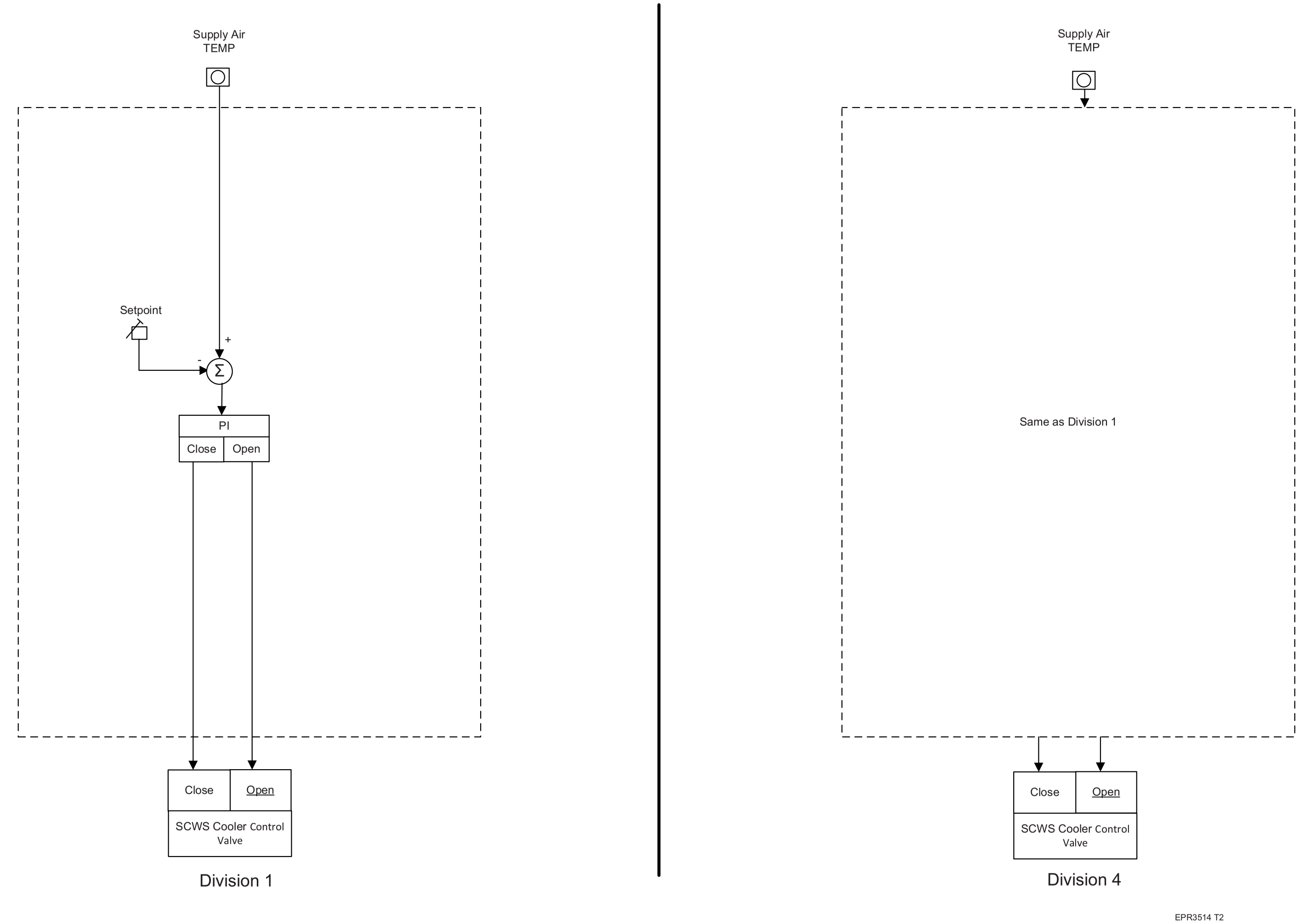
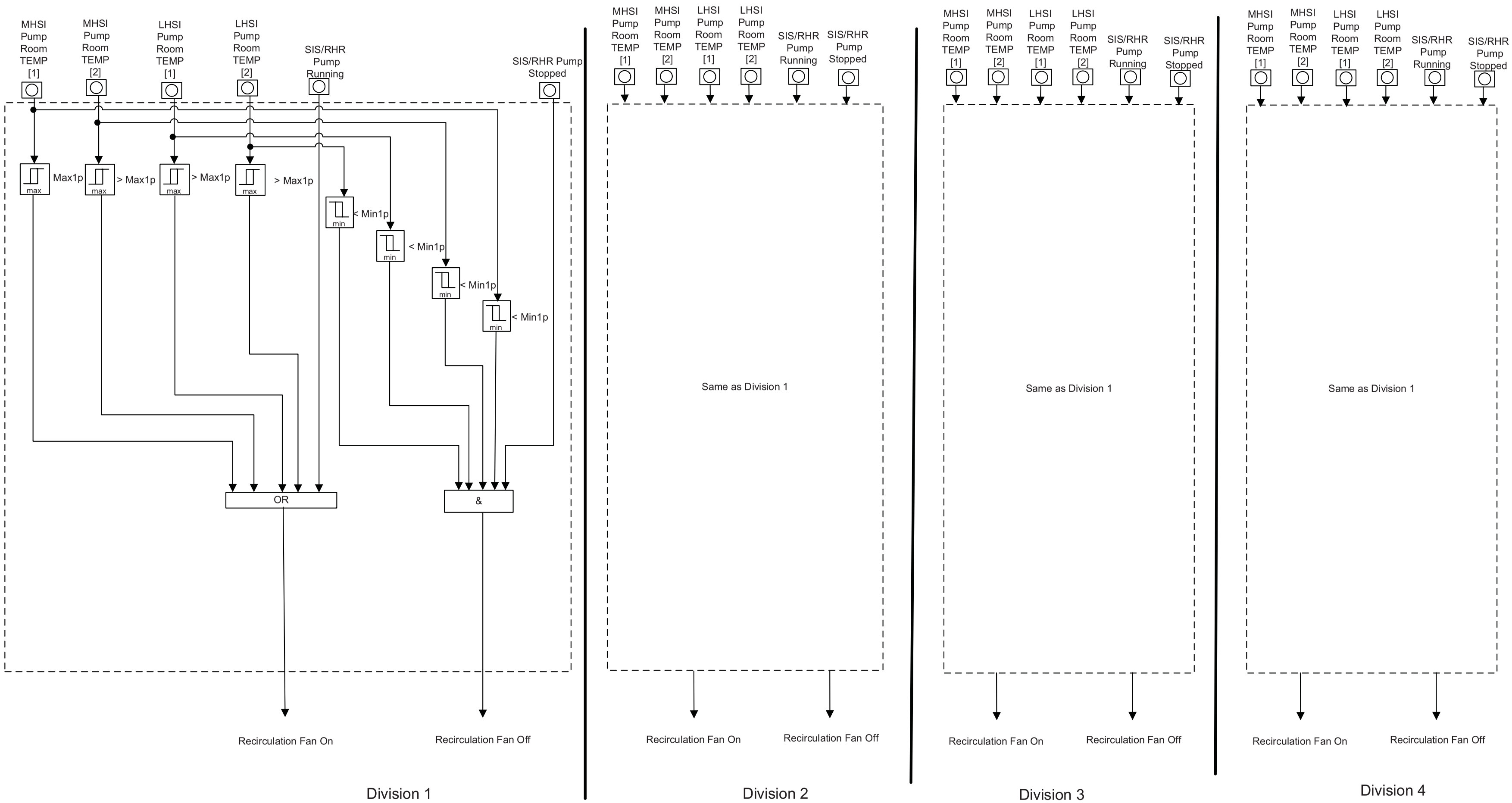
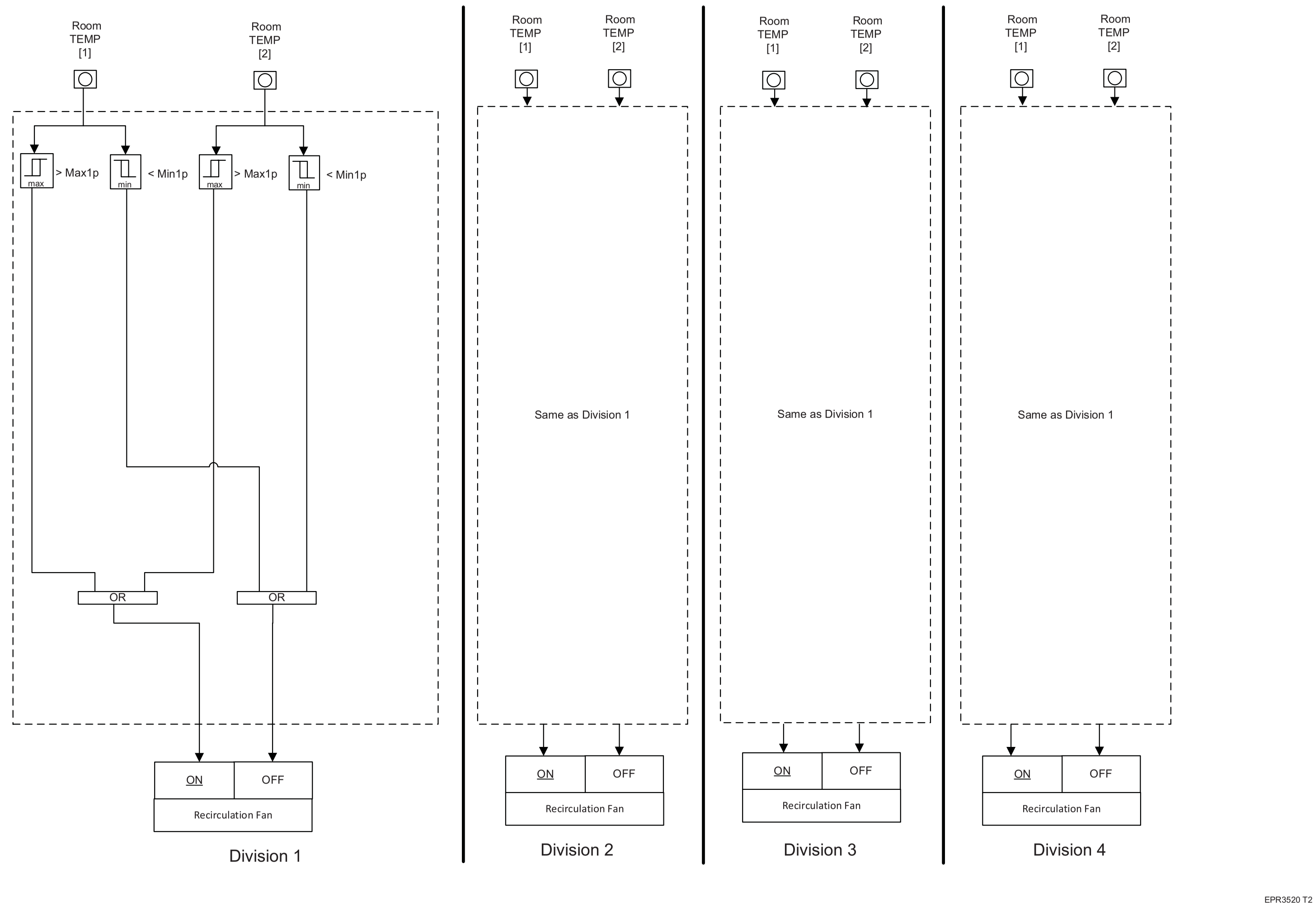


Figure 7.3-46—SBVS SIS / RHRS Pump Rooms Heat Removal



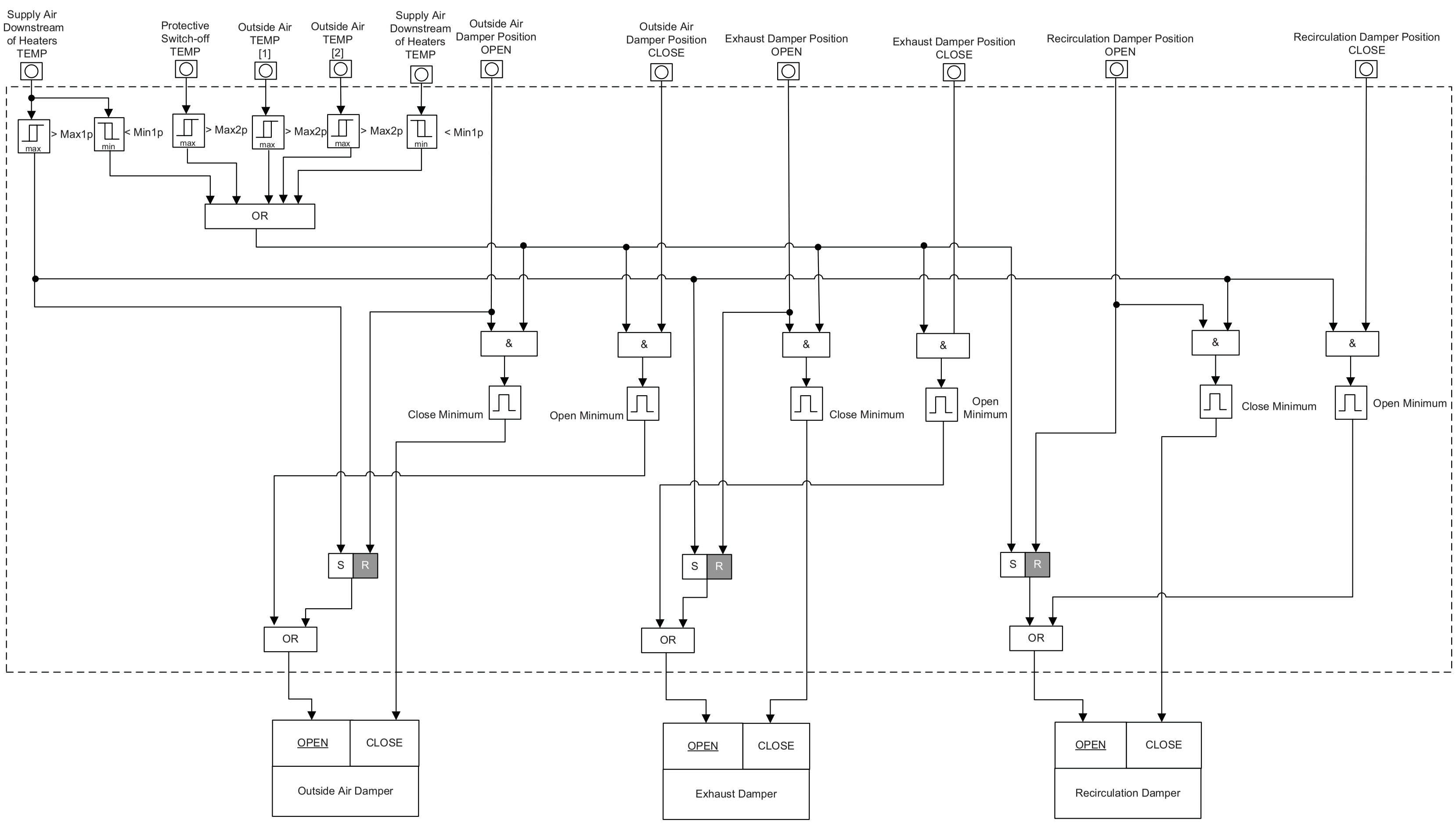
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-47—SBVS CCWS / EFWS Valve Rooms Heat Removal



All indicated changes are in response to RAI 505, Question 07.01-35

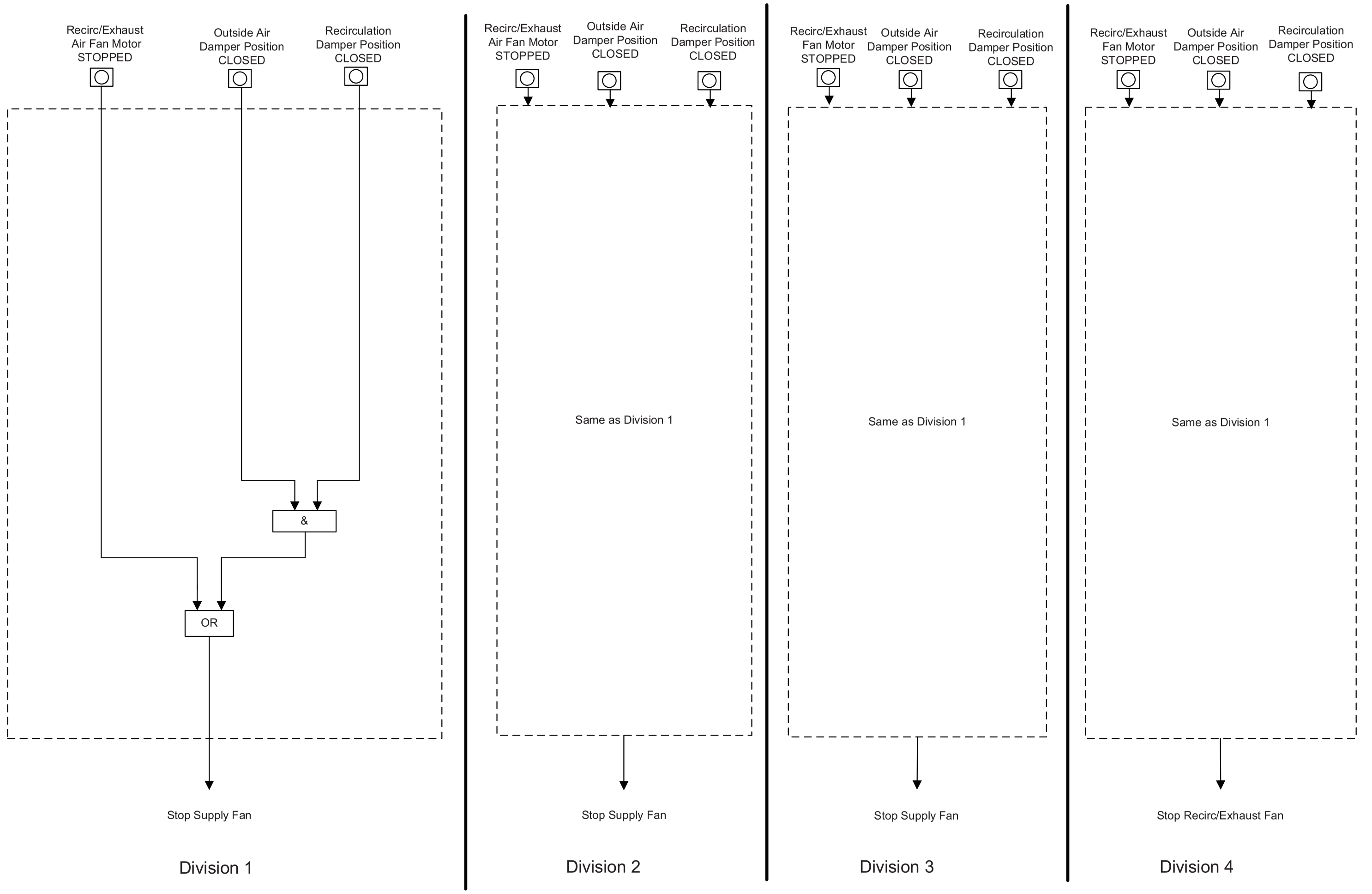
Figure 7.3-48—SBVSE Supply and Recirculation-Exhaust Air Flow Control



Division 1
The same logic is implemented for Divisions 2,3,& 4

All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-49—SBVSE Supply Fan Safe Shut-Off



All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-50—SBVSE Recirculation Fan Safe Shut-Off

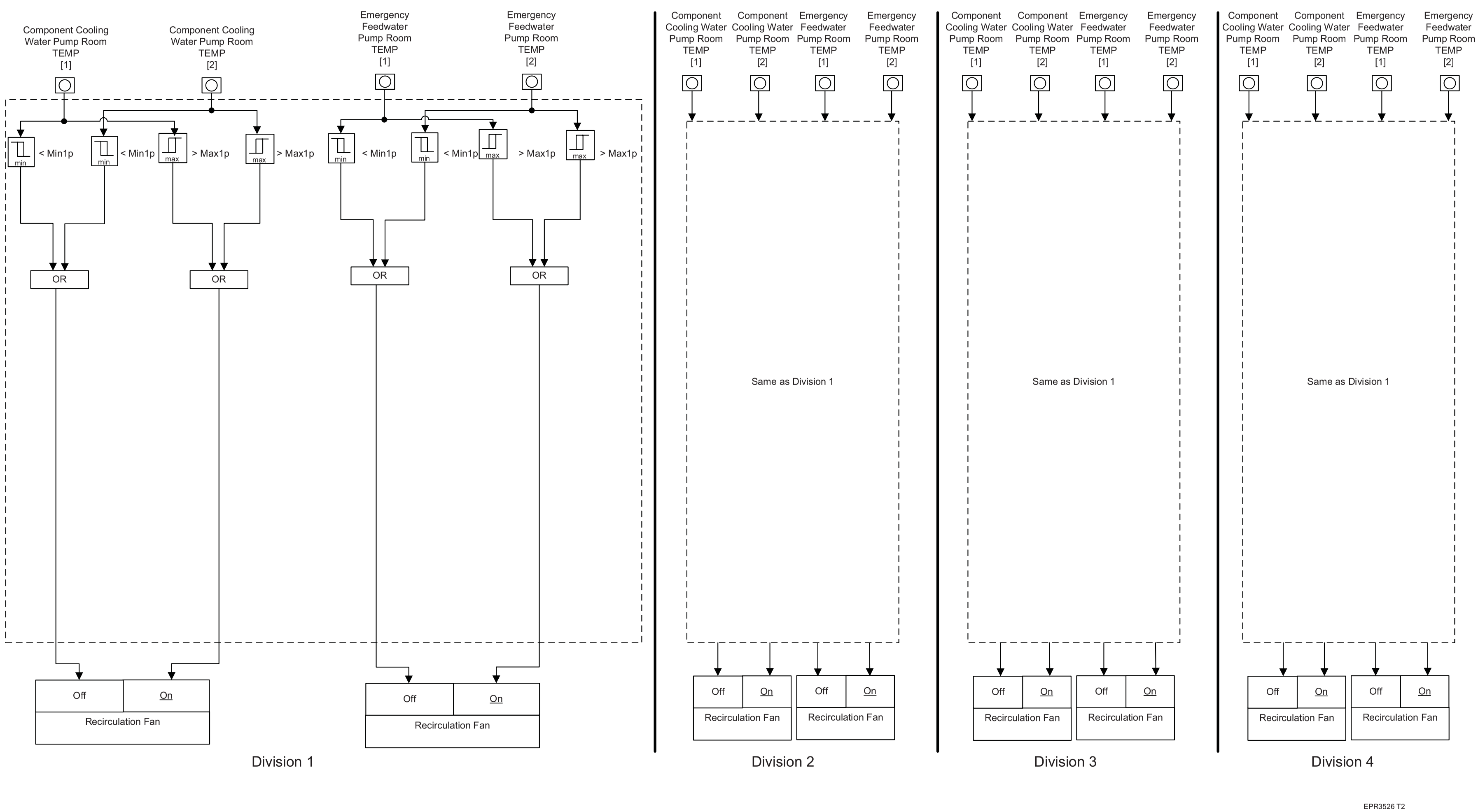
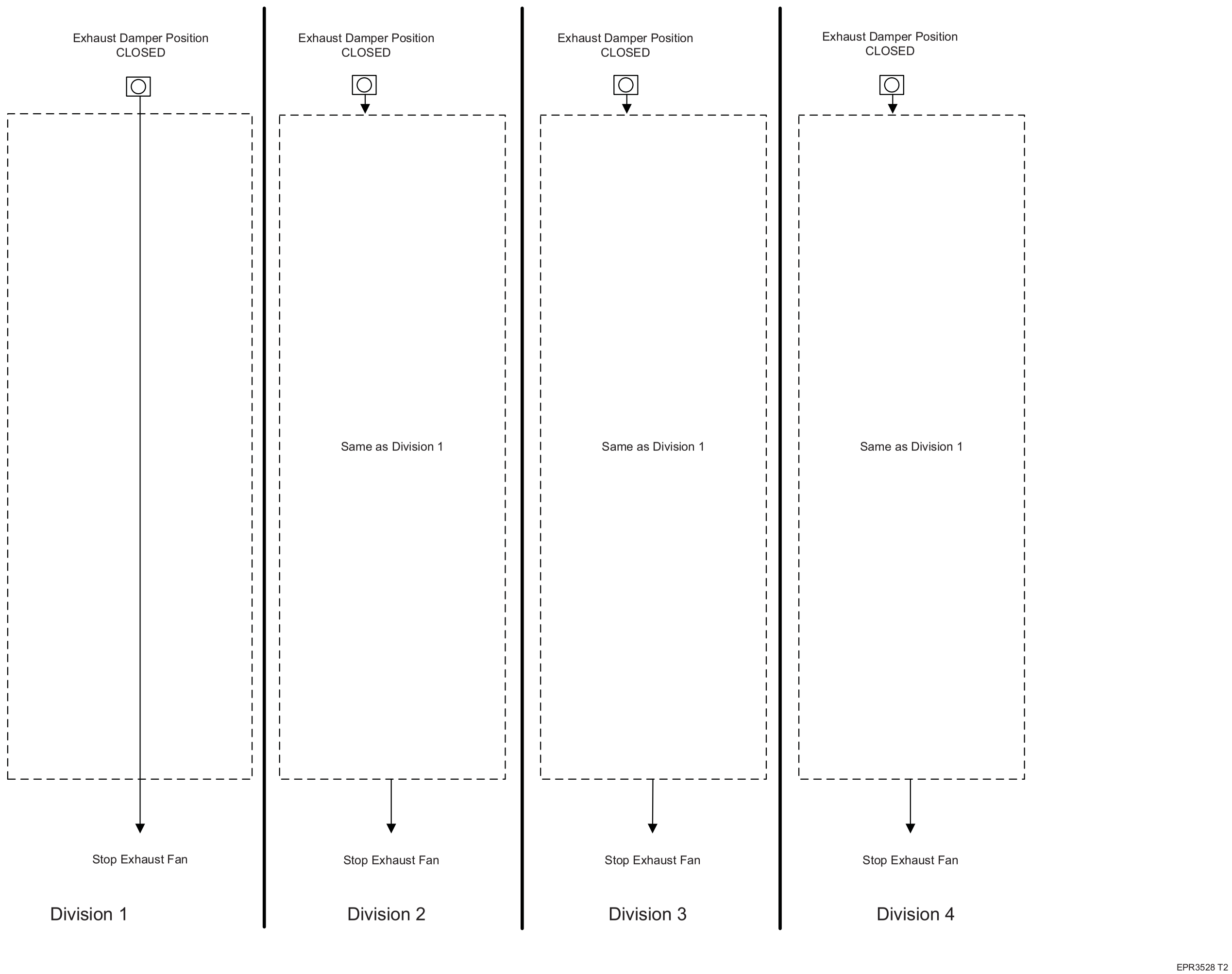
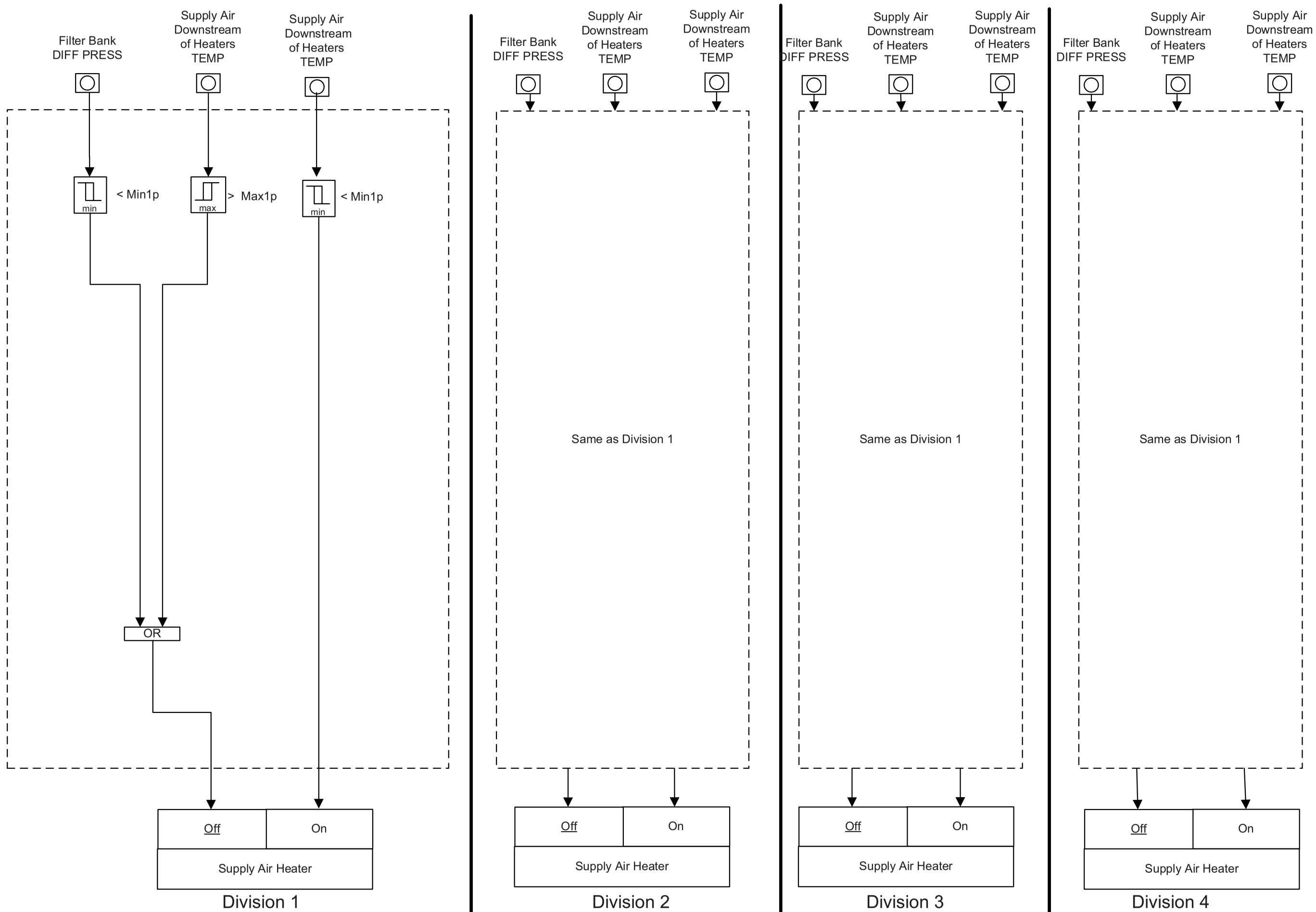


Figure 7.3-51—SBVSE Exhaust Fan Safe Shut-Off



All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-52—SBVSE Supply Air Temperature Heater Control



All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-53—SBVSE Freeze Protection

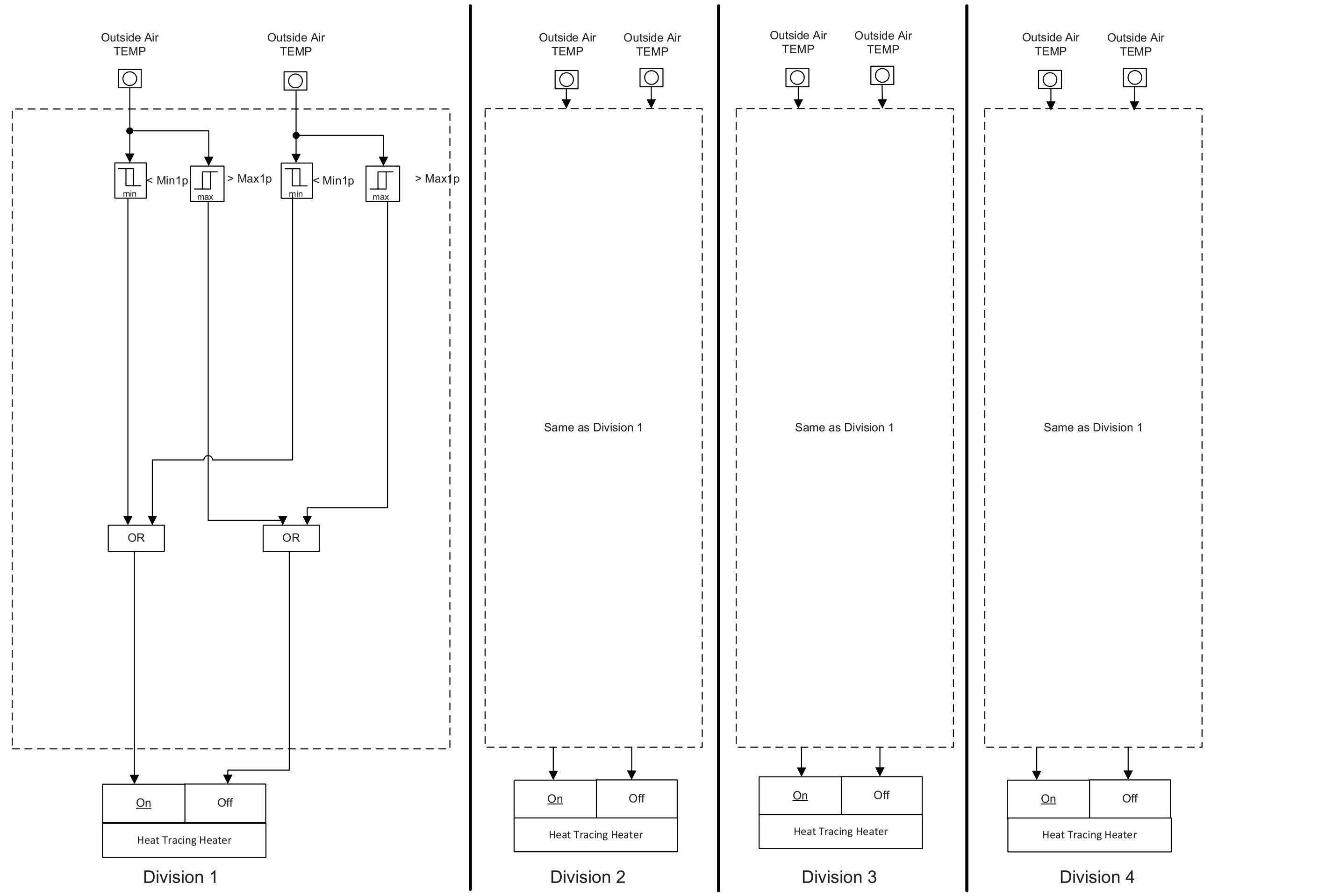


Figure 7.3-54—SBVSE Supply Air Temperature Control for Supply Air Cooling

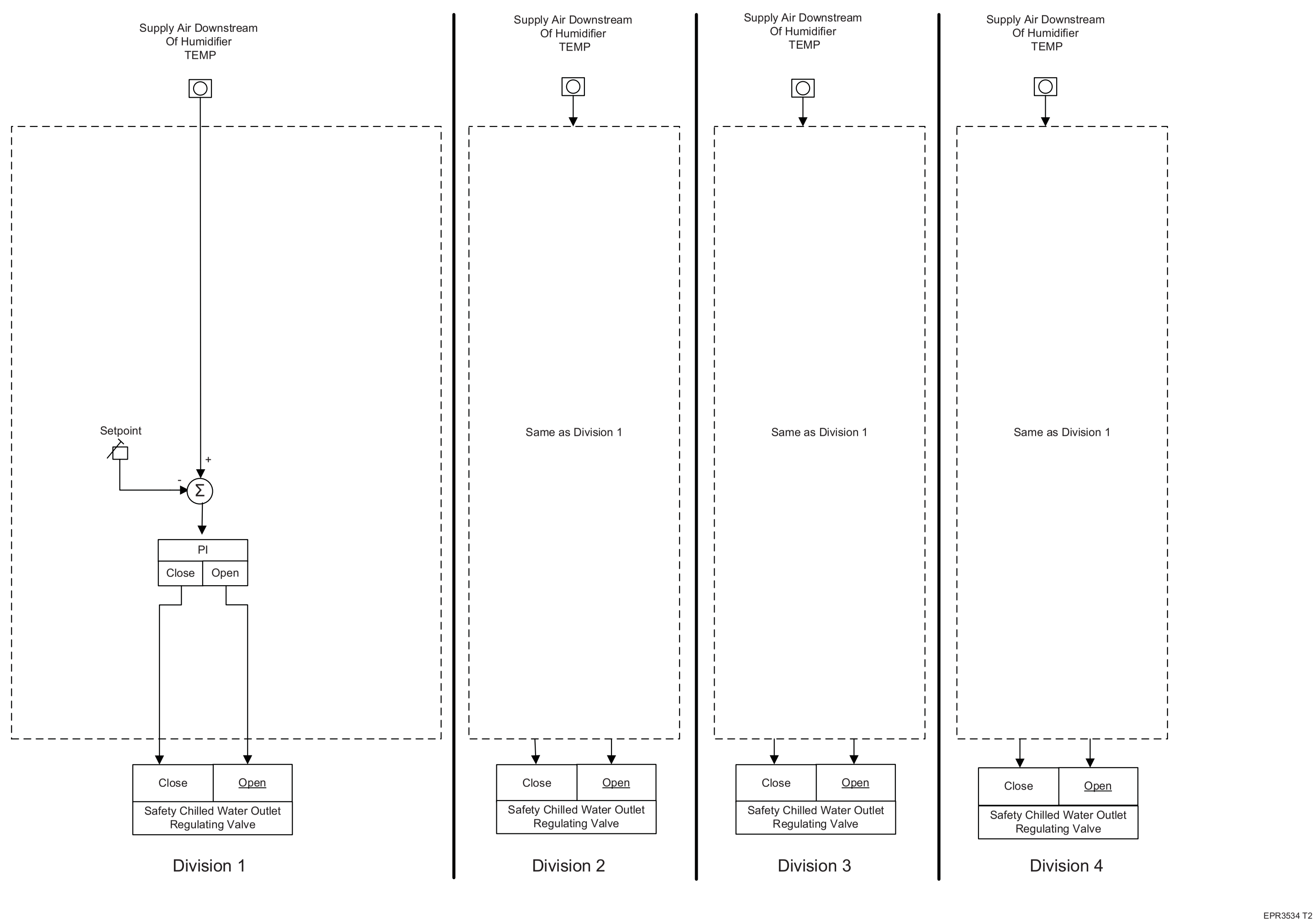
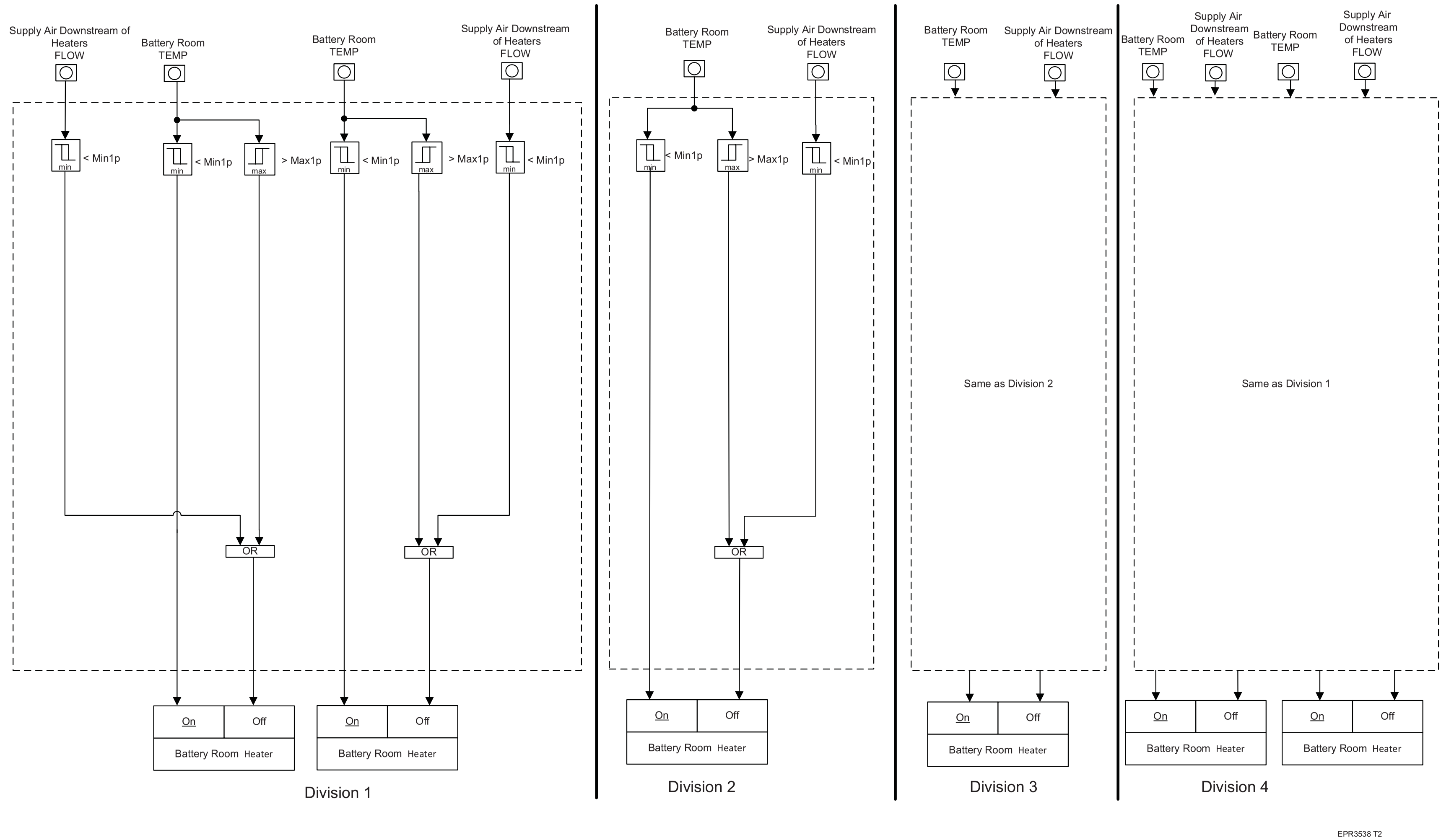


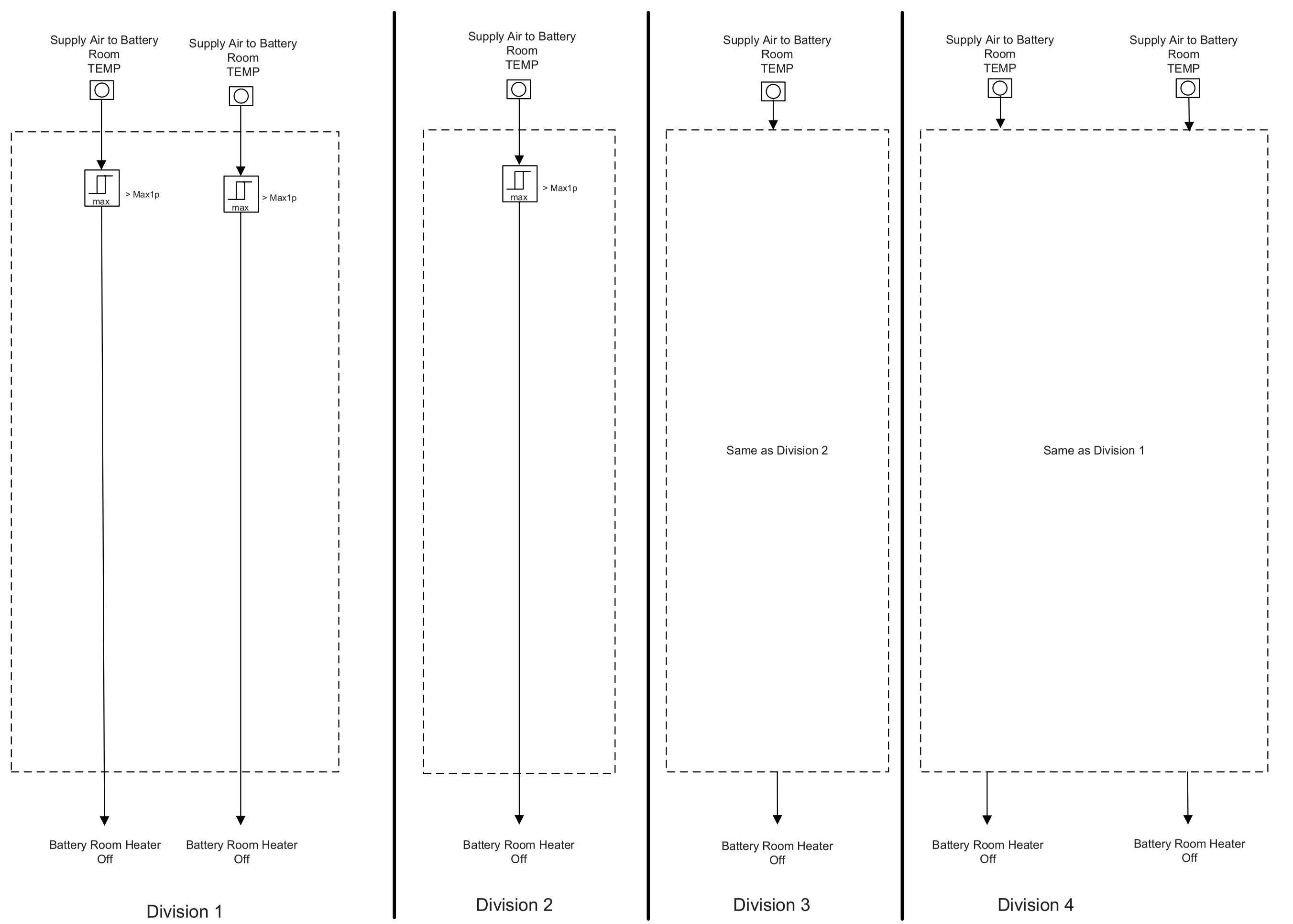
Figure 7.3-55—Deleted

Figure 7.3-56—SBVSE Battery Room Heater Control



All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-57—SBVSE Battery Room Supply Air Temperature Control



All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-58—SBVSE EFWS Pump Room Heat Removal

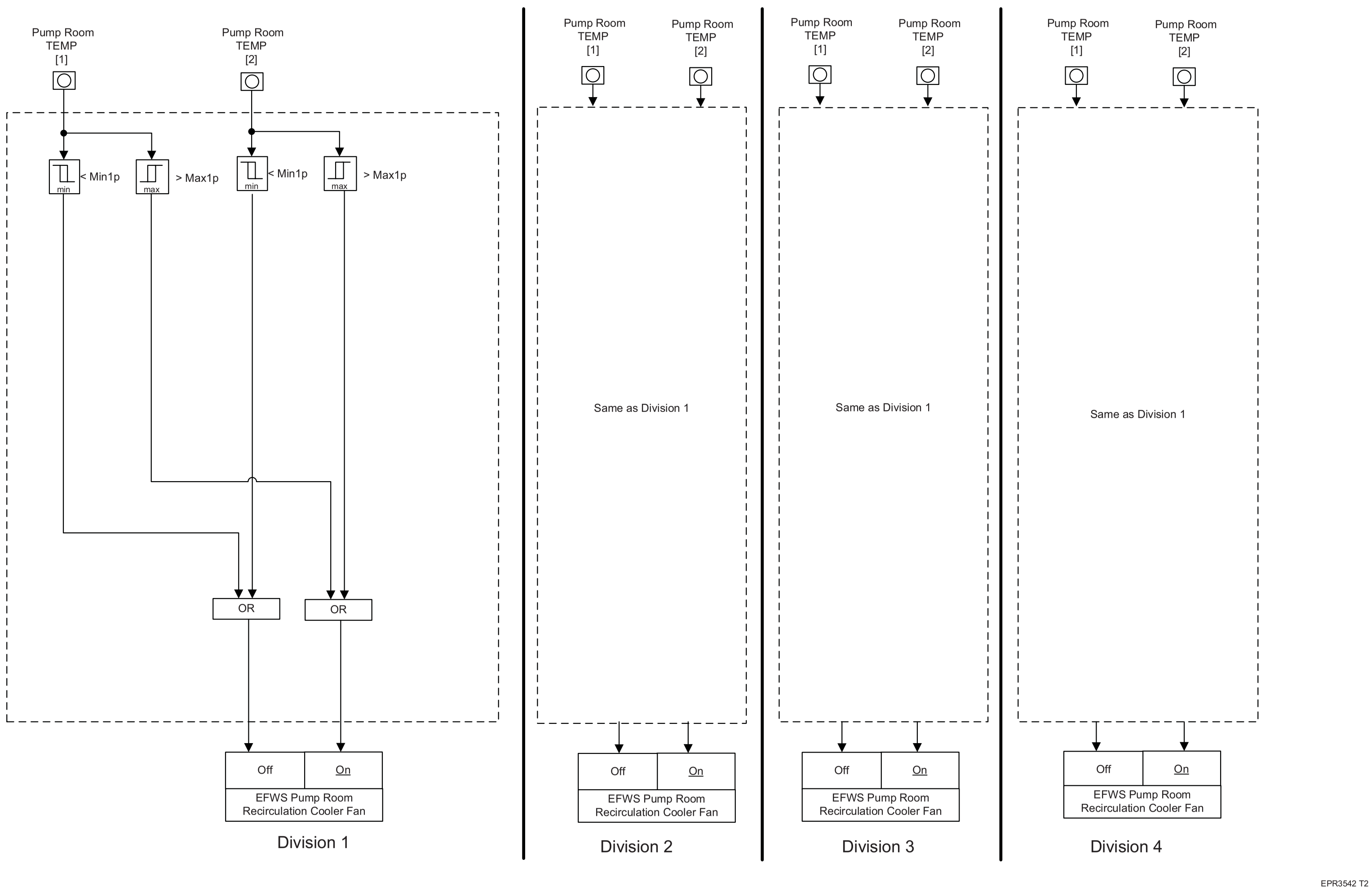
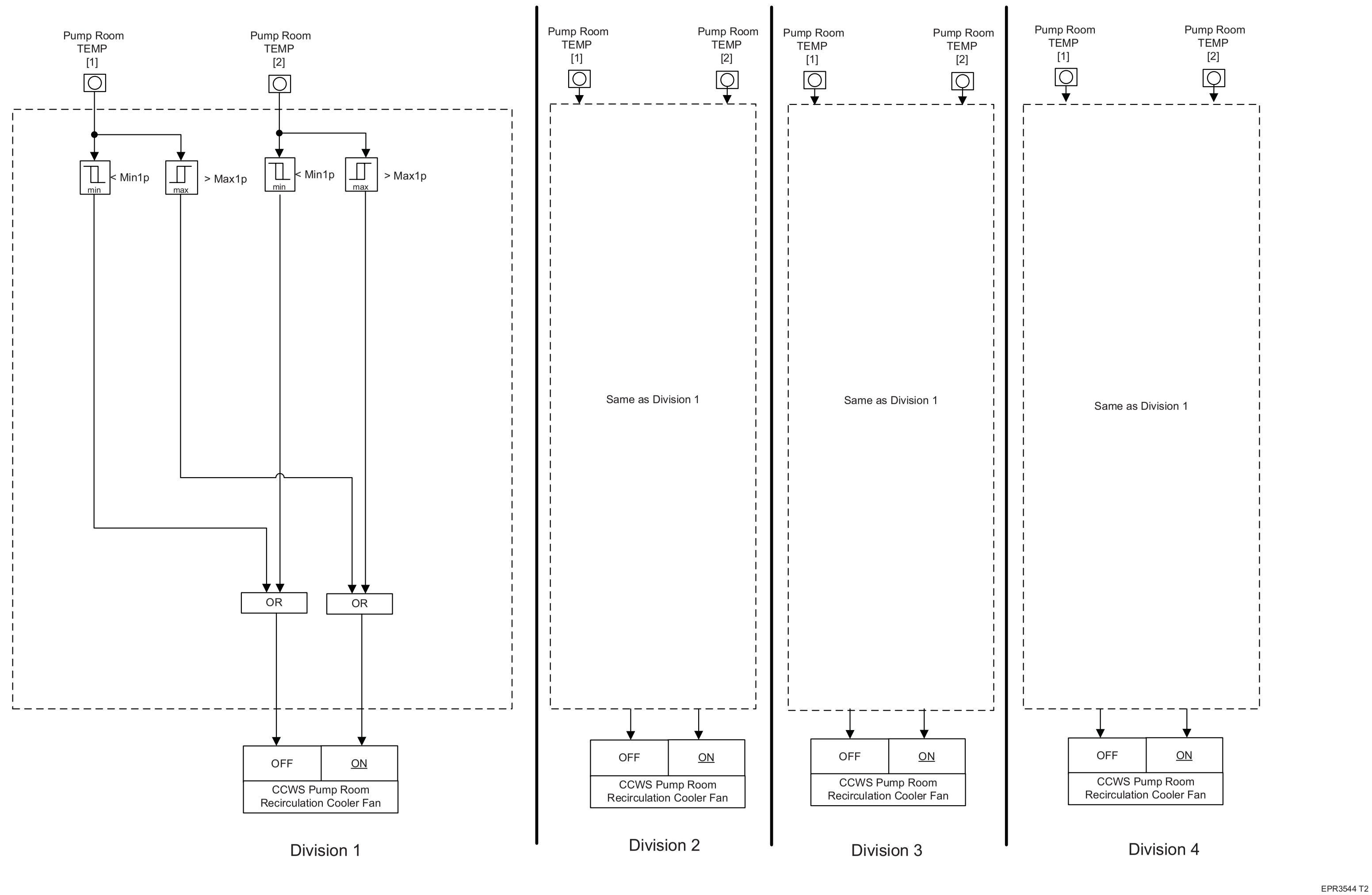


Figure 7.3-59—SBVSE CCWS Pump Room Heat Removal



All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-60—SIS / RHRS Automatic RHRS Flow Rate Control

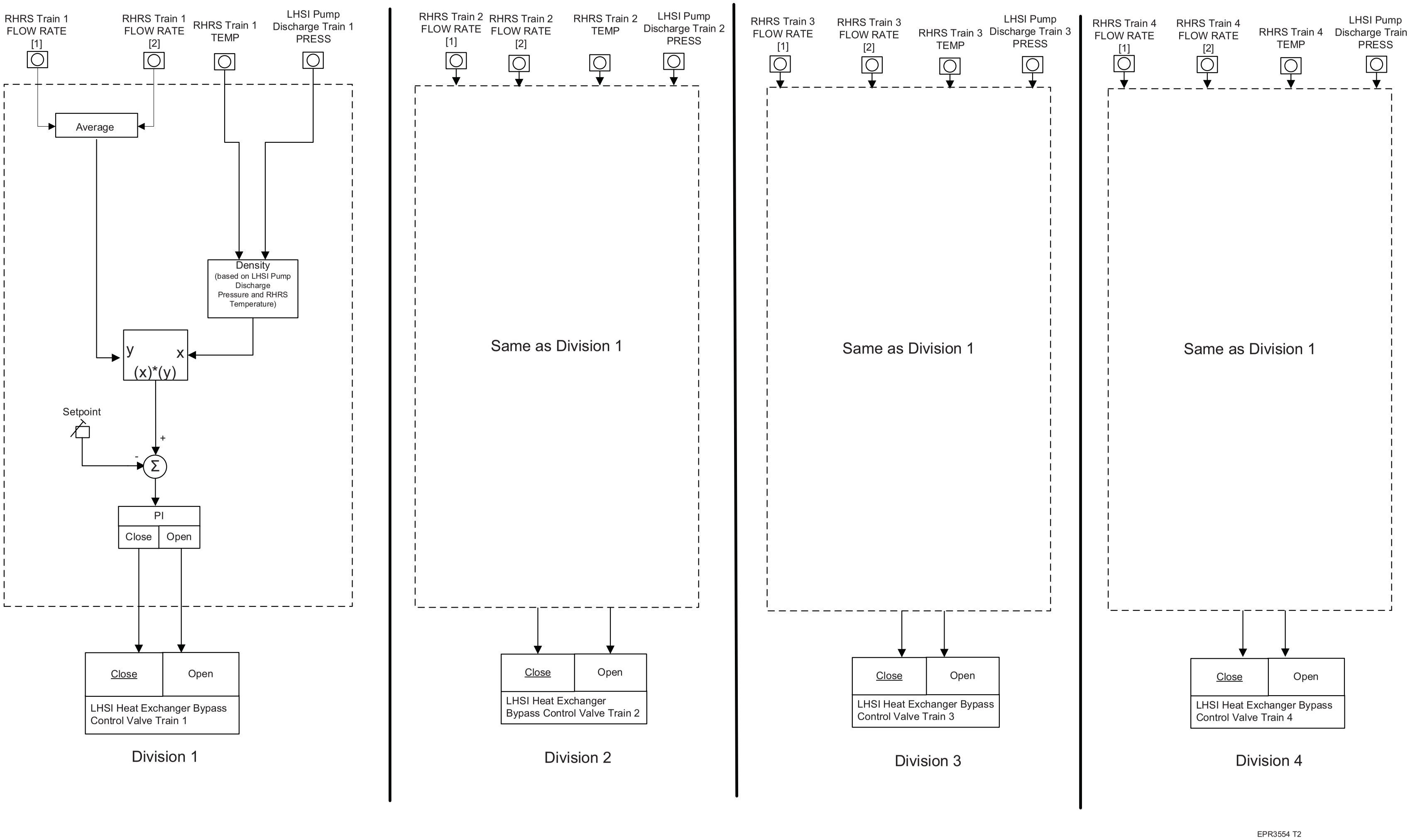
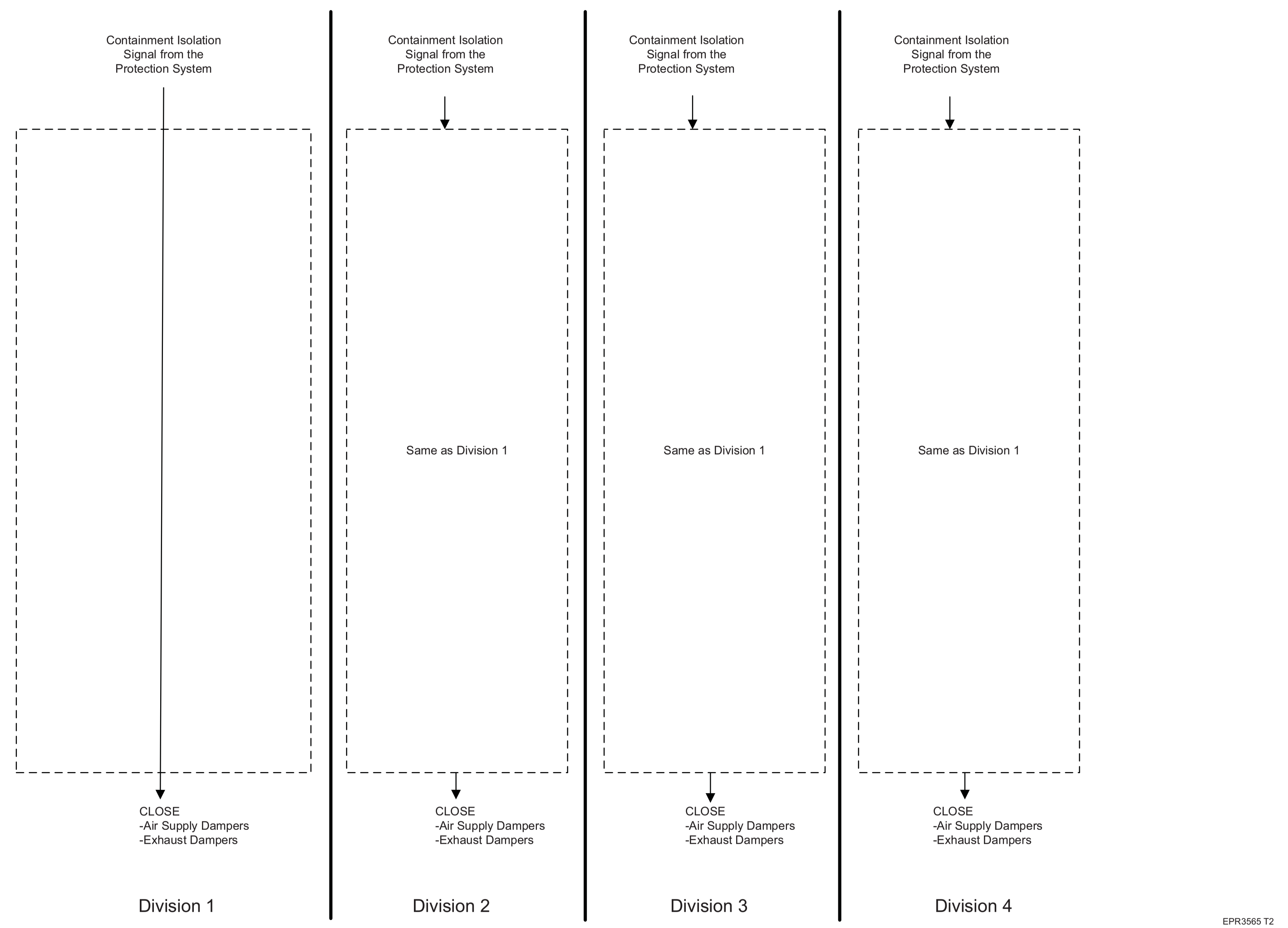


Figure 7.3-61—Deleted

All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-62—Isolation of FBVS on Containment Isolation



All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.3-63—Fuel Pool Area Fuel Handling Accident

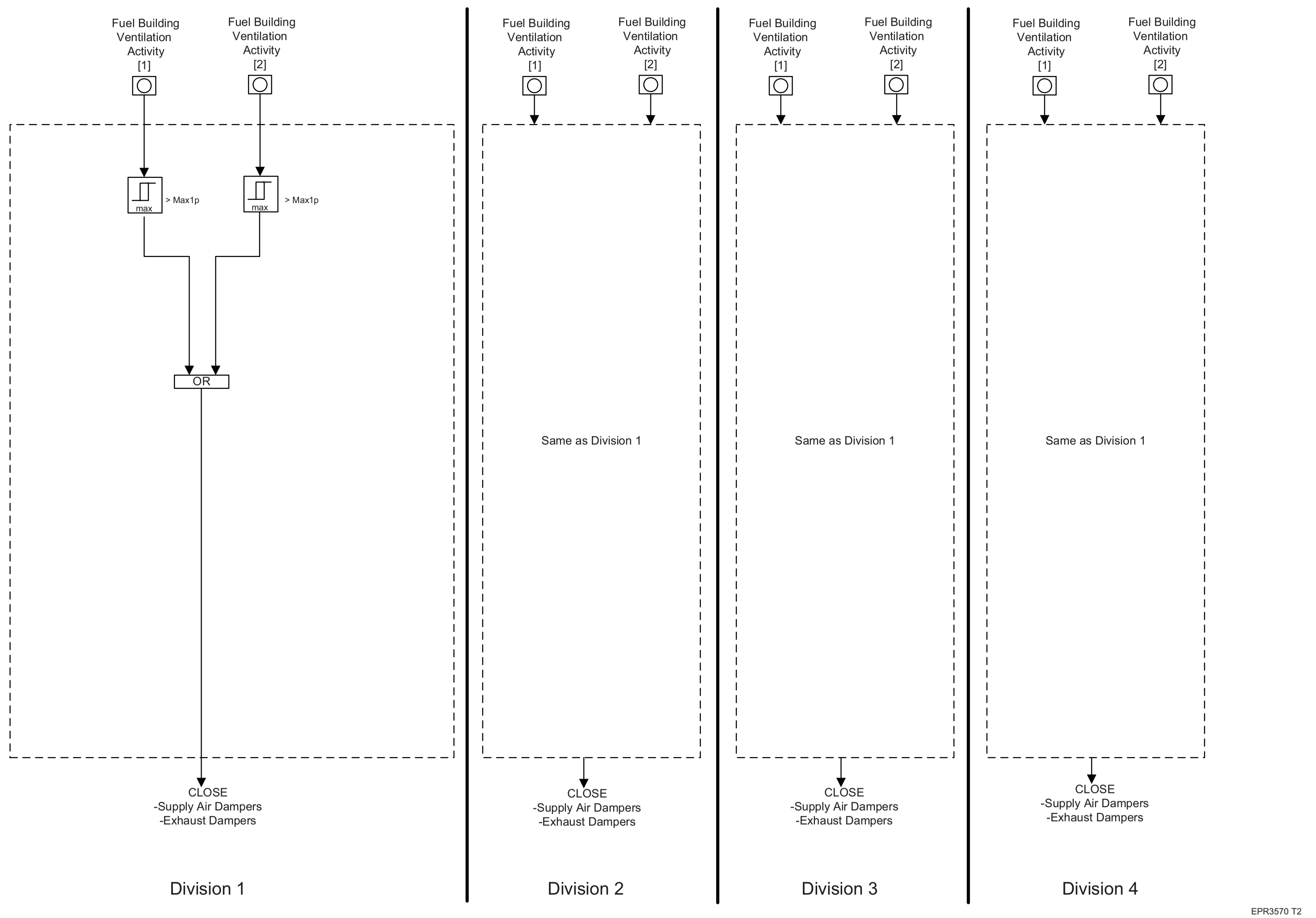
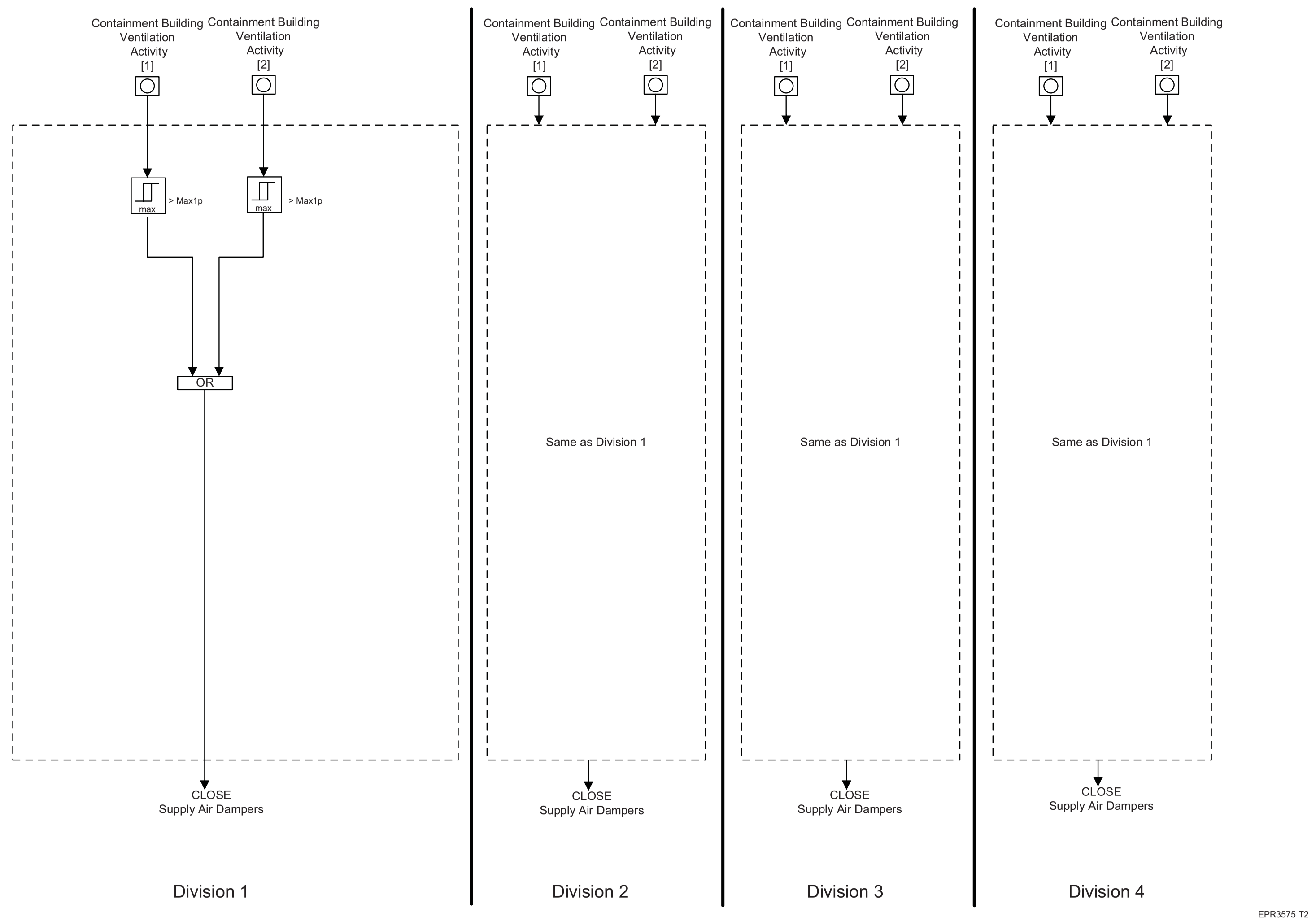


Figure 7.3-64—Reactor Building Fuel Handling Accident



the P14 permissive, providing a third diverse condition that must be satisfied to allow valve opening.

When RHR is connected, an inadvertent increase in RCS pressure does not result in an automatic signal to close the RHR RCPB isolation valves. However, the following design features prevent an increasing pressure from exceeding the RHR system design pressure:

- Interlock holding the MHSI large miniflow lines open (see Section 7.6.1.2.8).
- Pressurizer safety relief valves operating in their LTOP mode (see Section 7.3.1.2.13).
- Spring loaded safety valves on the RHR suction lines.

During an intentional increase in pressure, when RCS temperature and pressure exceed the P14 permissive setpoint, the operator is prompted to manually inhibit the P14 permissive, and is then allowed to close the RHR RCPB isolation valves.

The operational status of the PS on a divisional basis is provided to the operator. Indications and alarms are provided to the operator regarding the state of the P14 permissive signal. Additionally, the following indications are provided to the operator to verify correct operation of the interlock:

- Open or closed position of first RHR RCPB isolation valve (each train).
- Open or closed position of second RHR RCPB isolation valve (each train).

7.6.1.2.2 SIS /RHRS Automatic Trip of LHSI Pump (in RHR Mode) on Low ΔPsat Interlock

The SIS/RHRS has a safety-related function to provide the RCS residual heat removal to reach cold shutdown, refueling modes and to control primary temperature. The function to automatically trip the LHSI pump upon a low ΔPsat signal supports the safety-related function of providing residual heat removal by maintaining LHSI pump operability by shutting down the pump to prevent pump damage due to inadequate net positive suction head (NPSH) or unavailability due to steam binding following a failure that results in RCS conditions approaching saturation. The functional logic is shown in Figure 7.6-9—SIS / RHRS Automatic Trip of LHSI Pump (in RHR Mode) on Low ΔPsat Interlock.

7.6.1.2.3 SIS / RHRS Automatic Trip of LHSI Pump (in RHR Mode) on Low-Low RCS Loop Level Interlock

The SIS/RHRS has a safety-related function to provide the RCS residual heat removal to reach cold shutdown, refueling modes and to control primary temperature. The function to automatically trip the LHSI pump upon a low RCS loop level signal

supports the safety-related function of providing residual heat removal by maintaining LHSI pump operability by shutting down the pump to prevent pump damage or unavailability due to air binding following a failure that results in low RCS loop level. The functional logic is shown in Figure 7.6-10—SIS / RHRS Automatic Trip of LHSI Pump (in RHR Mode) on Low-Low RCS Loop Level Interlock.

7.6.1.2.4 Safety Injection Accumulator Interlocks

There are four accumulators, one associated with each of the four independent SIS trains. Borated water is injected into the RCS from the accumulators when RCS pressure falls below the internal pressure of the accumulators.

The operation of the SI accumulators is described in Section 6.3.

Each accumulator is connected to the cold leg injection line of its respective RCS loop through two check valves and a motor operated isolation valve in series. Each isolation valve is interlocked to remain open above a specified RCS pressure value. This pressure value is the P12 permissive threshold.

Generation of the P12 permissive signal is described in Section 7.2.1.3.7.

Normally, the operator opens the isolation valves when RCS pressure exceeds accumulator pressure. Regardless, when RCS pressure increases above the P12 permissive threshold, the PS provides automatic signals to open the accumulator isolation valves. Once the valves are verified to be in the open position, control power is removed from the valves to prevent inadvertent closure. During a normal decrease in pressure, power is restored to the valves at a point in time determined by the operating procedures. Then, after RCS pressure decreases below the P12 permissive threshold, the operator is prompted to manually validate the P12 permissive, which allows the isolation valves to be closed before RCS pressure is reduced below the accumulator pressure.

A pressure region exists below the P12 permissive pressure threshold where the accumulators are required to be available but Plant Technical Specifications allow an accumulator isolation valve to be closed for a short period of time. To accommodate operation in this pressure region, an automatic 'open' signal is sent to the accumulator isolation valves when an SIS actuation occurs. The SIS actuation function is described in Section 7.3.1.2.1.

Two redundant ALUs within a division send the automatic opening signal through a "functional OR" logic to the isolation valve of the corresponding accumulator (i.e., PS Division 1 opens the isolation valve related to the Train 1 accumulator). This arrangement precludes a single actuator logic unit (ALU) failure from preventing the opening of a valve. Any other single failure which could prevent opening of a valve, such as failure of a PACS module or of the valve itself, is detected immediately by

failure of the valve to open. Corrective actions can then be taken before continued increase in pressure.

The operational status of the PS on a divisional basis is provided to the operator. Indications and alarms are provided to the operator regarding the state of the P12 permissive signal. Additionally, the following indications are provided to the operator to verify correct operation of the interlock:

- Pressure and level of each accumulator.
- Open or closed position of each accumulator isolation valve.

7.6.1.2.5 ~~Interlocks Isolating Redundant CCWS Trains~~CCWS Valves Interlocks

The CCWS is comprised of four closed-loop, safety-related supply trains that function to cool and transfer heat load from safety-related users to the emergency service water system (ultimate heat sink). The common loads cooled by the CCWS consist of two separate sets, referred to as Common-1 and Common-2. The Common-1 header is supplied by either CCWS Train 1 or Train 2 while the Common-2 header is supplied by either CCWS Train 3 or Train 4. Each common header is further divided into two sub-headers designated as Common 1a and 1b or Common 2a and 2b.

The operation of the CCWS is described in Section 9.2.2.

Switchover Valves Interlock

Interlocks are provided so that no two redundant CCWS trains are connected to the same common header at the same time. Each CCWS train is provided with four switchover valves to perform the required train separation.

CCWS Train 1 has a single valve on the supply side and a single valve on the return side of Common 1a. Train 2 also has a single valve on both the supply and return sides of Common 1a. These valves are interlocked so that both valves (supply and return) on Train 1 must be closed before either valve on Train 2 can be opened. Likewise, both valves on Train 2 must be closed before either valve on Train 1 can be opened. The same valve arrangement and interlocks are provided relative to Common 1b to provide separation between Trains 1 and 2, and on Common 2a and 2b to provide separation between Trains 3 and 4. The functional logic for the switchover valve interlock is shown in Figure 7.6-1—CCWS Switchover Valves Interlock.

~~Another interlocking function is required concerning the cooling paths of the Common 1b and Common 2b headers for the reactor coolant pump (RCP) thermal barriers. Either the Common 1b or 2b header can provide cooling to the RCP thermal barriers. To maintain strict CCWS train separation, one of the supply containment isolation valves (CIV) and one of the return CIVs on the RCP thermal barriers cooling path must be closed on the header being removed from service (1b or 2b) prior to~~

~~opening the CIVs on the header being placed in service (2b or 1b, respectively). The functional logic for the CIV interlock is shown in Figure 7.6-2.~~

The interlock functions maintaining separation between redundant CCWS trains are performed by the SAS. Each switchover valve is assigned to a SAS division based on the CCWS train it belongs to (i.e., switchover valves on Train 1 are assigned to SAS Division 1). Each division of SAS acquires position information from the valves to which it is assigned, and controls those same valves. In any SAS division, the information about the position of valves in other trains that is needed to control a switchover valve is provided via network connection by the SAS division which acquires the information. For example, the positions of the Train 2 valves on the supply and return of Common 1a are acquired by SAS Division 2. This information is provided via a network connection to SAS Division 1 to perform the interlock function for the Train 1 valves on the supply and return of Common 1a.

RCP Thermal Barrier Containment Isolation Valves Interlock

Another interlocking function is required concerning the cooling paths of the Common 1b and Common 2b headers for the reactor coolant pump (RCP) thermal barriers. Either the Common 1b or 2b header can provide cooling to the RCP thermal barriers. To maintain strict CCWS train separation, one of the supply containment isolation valves (CIV) and one of the return CIVs on the RCP thermal barriers cooling path must be closed on the header being removed from service (1b or 2b) prior to opening the CIVs on the header being placed in service (2b or 1b, respectively). The functional logic for the CIV interlock is shown in Figure 7.6-2—CCWS RCP Thermal Barrier Containment Isolation Valves Interlock.

The interlock function concerning the CIVs is also performed by the SAS, but is only performed in Divisions 1 and 4. The CIVs are assigned to SAS divisions for control based on which electrical division provides power to the valves (i.e., valves powered by electrical Division 1 are controlled by SAS Division 1). The closed position indications of the CIVs on Common 1b are used to allow opening of the CIVs on Common 2b, and the closed position indication of the CIVs in Common 2b are used to allow the opening of the CIVs on Common 1b.

Redundant SAS controllers are provided in each division, and redundant networks are used between the divisions so that no single failure within the SAS can result in inadvertent connection of redundant CCWS trains. Each valve is equipped with redundant open/closed position sensors so that a single sensor failure does not result in inadvertent connection of redundant CCWS trains. While each switchover valve is controlled by one SAS division, PACS modules in multiple divisions, acting on multiple solenoid devices, are required in order to change the position of a switchover valve. Therefore, a single PACS module failure does not result in inadvertent connection of redundant CCWS trains. For the CIV interlock, redundancy is obtained

through the use of inner and outer CIVs, each controlled by a different division of SAS.

The single failure tolerance of the CCWS with respect to availability of the required cooling function is encompassed within the redundancy of the mechanical system design, as described in Section 9.2.2.

The following indications are provided to the operator relative to these interlocks:

- Indication of open or closed position of each interlocked valve.
- Alarm indicating position conflict between supply and return switchover valve of the same CCWS train relative to the same common header.
- Alarm indicating position conflict between CIVs of the same common header.
- Alarm indicating connection of two CCWS trains to the same common header.

7.6.1.2.6 IRWSTS Boundary Isolation for Preserving IRWST Water Inventory Interlock

The CCWS has a safety-related function to remove heat from safety-related components (GDC 44). The interlock function is required to verify that the two trains connected to their common headers remain separated and each are able to provide their corresponding LHSI HX with the required flow for heat removal. Removing heat from the LHSI HX is a safety-related function. The functional logic is shown in Figure 7.6-4—IRWSTS Boundary Isolation for Preserving IRWST Water Inventory Interlock.

7.6.1.2.7 Safety Chilled Water System Interlocks

The SCWS has the following safety-related functions:

1. Transfer of heat loads from safety-related SSC to a heat sink under both normal operating and accident conditions,
2. Component redundancy for performance of safety functions assuming a single, active component failure coincident with the loss of offsite power,
3. The capability to isolate components, systems, or piping, if required, so system safety functions are not compromised.

The following automatic switchover functions verify that the SCWS is capable of fulfilling the safety-related functions in compliance with GDC 44:

- SCWS Train 1 to Train 2 Switchover on Train 1 Low Evaporator Flow:

  The functional logic is shown in Figure 7.6-5—SCWS Train 1 to Train 2 Switchover on Train 1 Low Evaporator Flow / Chiller Blackbox Internal Fault /

SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 2 to Train 1 Switchover on Train 2 Low Evaporator Flow:

  The functional logic is shown in Figure 7.6-6—SCWS Train 2 to Train 1 Switchover on Train 2 Low Evaporator Flow / Chiller Blackbox Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 3 to Train 4 Switchover on Train 3 Low Evaporator Flow:

  The functional logic is shown in Figure 7.6-7—SCWS Train 3 to Train 4 Switchover on Train 3 Low Evaporator Flow / Chiller Blackbox Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 4 to Train 3 Switchover on Train 4 Low Evaporator Flow:

  The functional logic is shown in Figure 7.6-8—SCWS Train 4 to Train 3 Switchover on Train 4 Low Evaporator Flow / Chiller Blackbox Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 1 to Train 2 Switchover on Train 1 Chiller Blackbox Internal Fault:

  The functional logic is shown in Figure 7.6-5—SCWS Train 1 to Train 2 Switchover on Train 1 Low Evaporator Flow / Chiller Blackbox Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 2 to Train 1 Switchover on Train 2 Chiller Blackbox Internal Fault:

  The functional logic is shown in Figure 7.6-6—SCWS Train 2 to Train 1 Switchover on Train 2 Low Evaporator Flow / Chiller Blackbox Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 3 to Train 4 Switchover on Train 3 Chiller Blackbox Internal:

  The functional logic is shown in Figure 7.6-7—SCWS Train 3 to Train 4 Switchover on Train 3 Low Evaporator Flow / Chiller Blackbox Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 4 to Train 3 Switchover on Train 4 Chiller Blackbox Internal Fault:

  The functional logic is shown in Figure 7.6-8—SCWS Train 4 to Train 3 Switchover on Train 4 Low Evaporator Flow / Chiller Blackbox Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 2 to Train 1 Switchover on Train 2 Loss of UHS-CCWS:

The functional logic is shown in Figure 7.6-6—SCWS Train 2 to Train 1 Switchover on Train 2 Low Evaporator Flow / Chiller Blackbox Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 3 to Train 4 Switchover on Train 3 Loss of UHS-CCWS:

  The functional logic is shown in Figure 7.6-7—SCWS Train 3 to Train 4 Switchover on Train 3 Low Evaporator Flow / Chiller Blackbox Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 1 to Train 2 Switchover on Train 1 LOOP Re-Start Failure:

  The functional logic is shown in Figure 7.6-5—SCWS Train 1 to Train 2 Switchover on Train 1 Low Evaporator Flow / Chiller Blackbox Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 2 to Train 1 Switchover on Train 2 LOOP Re-Start Failure:

  The functional logic is shown in Figure 7.6-6—SCWS Train 2 to Train 1 Switchover on Train 2 Low Evaporator Flow / Chiller Blackbox Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 3 to Train 4 Switchover on Train 3 LOOP Re-Start Failure:

  The functional logic is shown in Figure 7.6-7—SCWS Train 3 to Train 4 Switchover on Train 3 Low Evaporator Flow / Chiller Blackbox Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

- SCWS Train 4 to Train 3 Switchover on Train 4 LOOP Re-Start Failure:

  The functional logic is shown in Figure 7.6-8—SCWS Train 4 to Train 3 Switchover on Train 4 Low Evaporator Flow / Chiller Blackbox Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock.

The following automatic control function verifies that the SCWS is capable of fulfilling its safety-related functions in compliance with GDC 44:

- SCWS Chiller Evaporator Water Flow Control for Trains 1 and 4 to prevent freezing at the evaporator coil:

  The functional logic is shown in Figures 7.6-5 through 7.6-8.

7.6.1.2.8 Interlocks to Provide Low Temperature Over-Pressure Protection

Section 5.2.2 describes LTOP for the U.S. EPR design. Low temperature RCPB overpressure events include mass input events and heat input events. A start of four

valves are no longer able to inject due to a higher RCS pressure caused by the single MHSI pump with its large miniflow valve closed. Therefore the other three MHSI pumps re-circulate through their miniflow lines to the IRWST. This leaves the one MHSI pump with its (failed) closed large miniflow valve injecting into the RCS. The RHR spring loaded safety valves are sized based on the pressure and flow rate of one MHSI pump, with large miniflow line isolated, injecting into the RCS while RHR is connected.

P17 temperature > RCS temperature

When the P17 permissive is validated, the MHSI large miniflow valves are interlocked in the open position. The PSRVs operating in their LTOP mode along with the interlock holding the large miniflow valves open provide over-pressure protection of the RHR system in this temperature regime.

The LTOP setpoints for opening of PSRVs are lower than the RHR spring-loaded safety valve setpoints. Therefore, during the postulated pressure addition event, the PSRVs relieve pressure before the design pressure of the connected RHR system is reached. The PSRV setpoints and sizing are based on the pressure and flow rate of four MHSI pumps, with one miniflow line isolated, injecting into the RCS. Actuation of the PSRVs by the PS in an LTOP capacity is described in Section 7.3.

Generation of the P14 and P17 permissive signals is described in Sections 7.2.1.2.9 and 7.2.1.3.12.

Detection of the RHR connected condition is shown in Figure 7.6-3. RHR isolation valves interlock is shown in Figure 7.6-11.

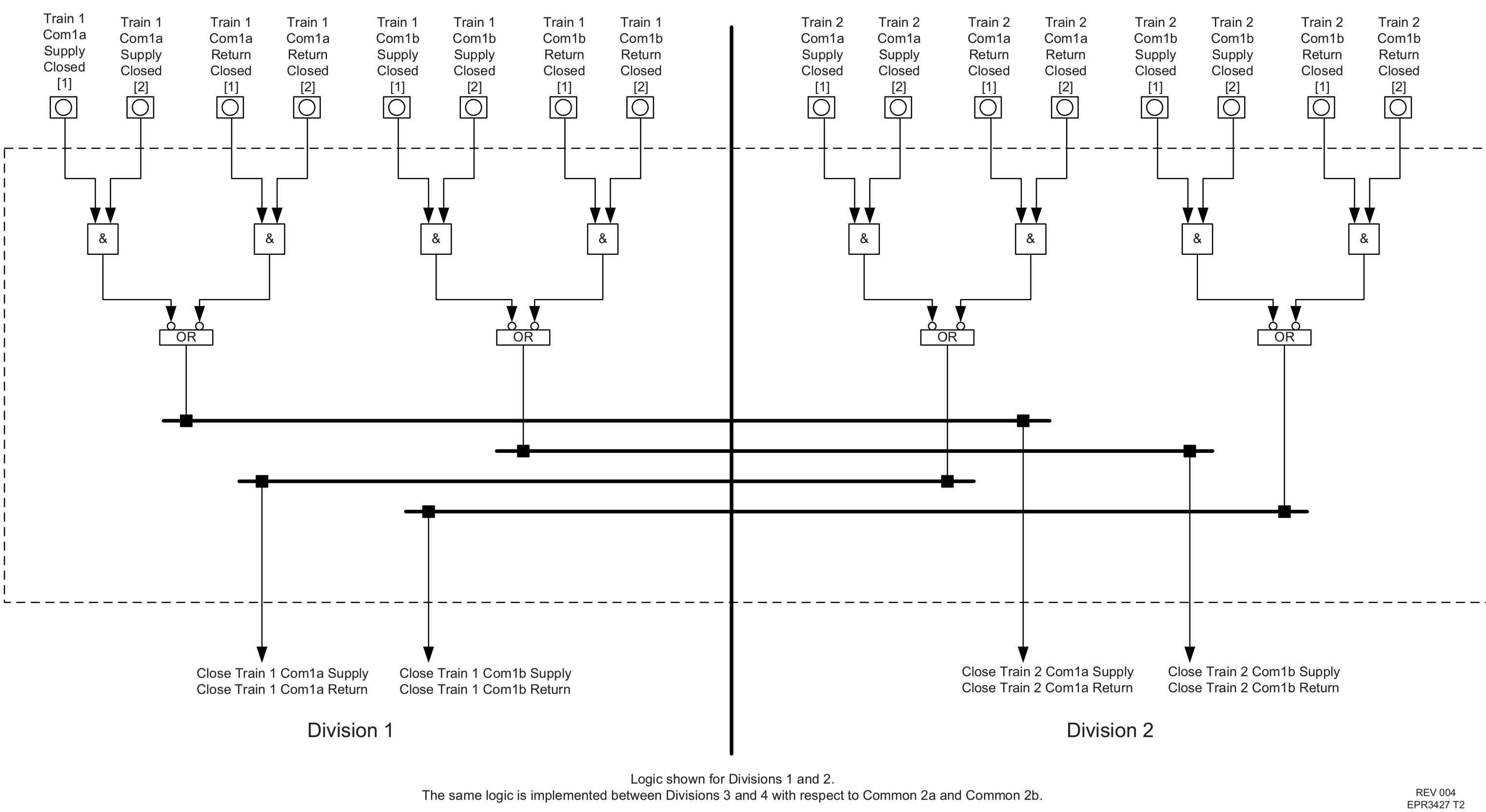
Two redundant ALUs within a PS division each send the interlock signal to the large miniflow line isolation valve of one MHSI train. This arrangement precludes a single ALU failure from preventing the opening of a valve. The failure of a single PACS module or of a single valve results in one MHSI large miniflow line being isolated, which is accounted for in the design of the RHR safety valves and PSRVs as previously described.

Additionally, no single failure can prevent the isolation valve from being closed on at least one MHSI injection path during power operation when maximum MHSI discharge pressure is required.

The operational status of the PS on a divisional basis is provided to the operator. Indications and alarms are provided to the operator regarding the state of the P14 and P17 permissives. Additionally, the following indications are provided to the operator to verify correct operation of the interlock:

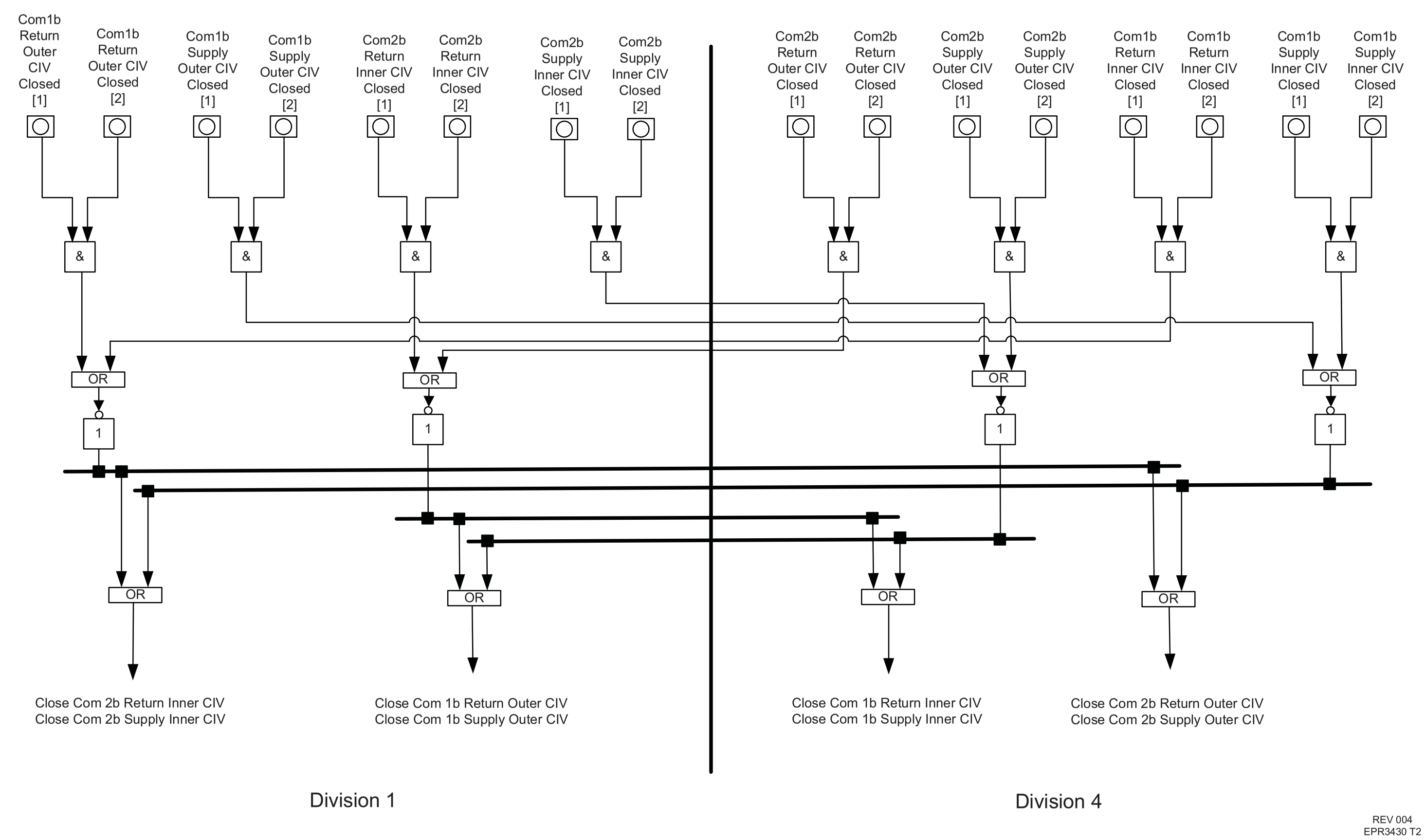
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.6-1—CCWS Switchover Valves Interlock



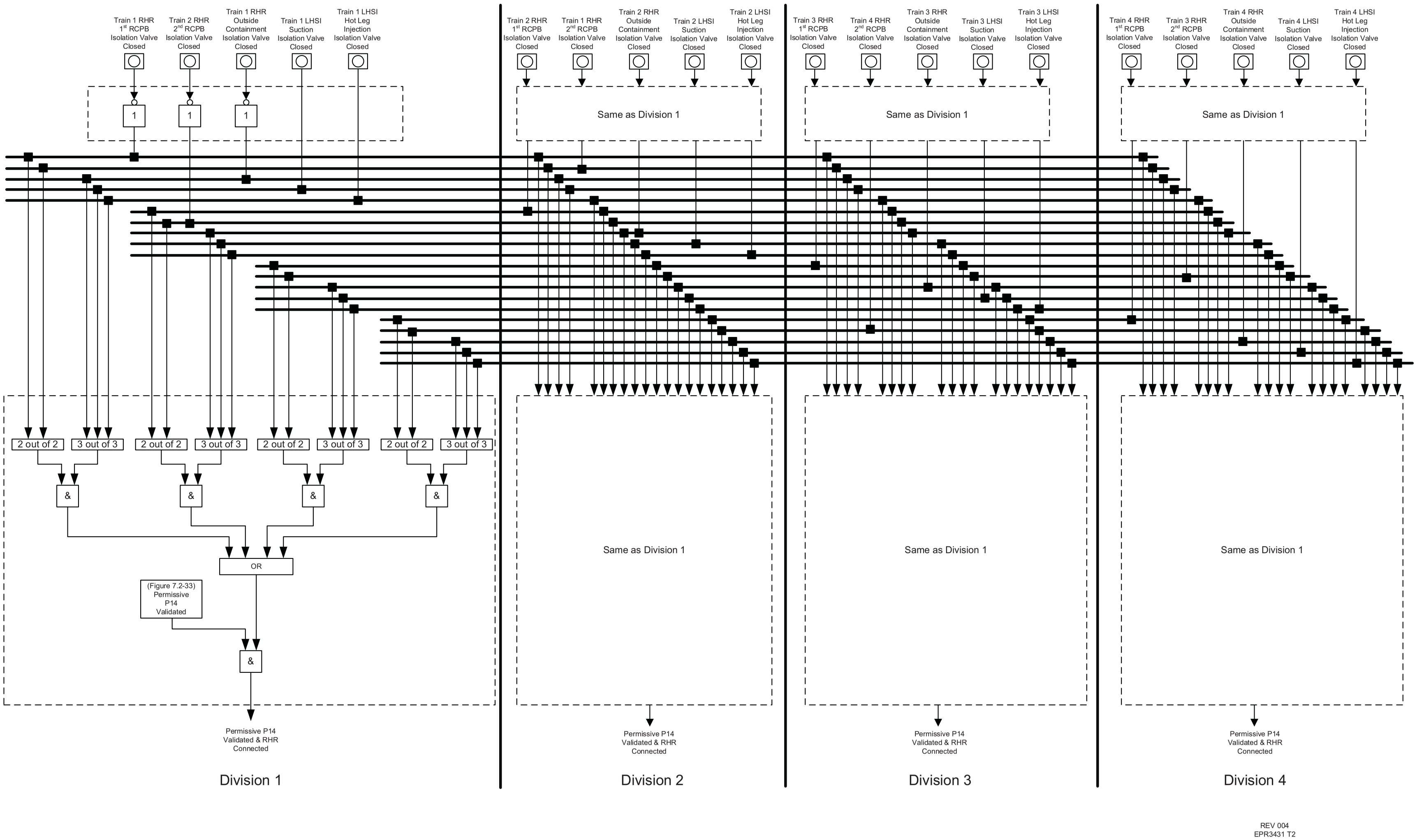
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.6-2—CCWS RCP Thermal Barrier Containment Isolation Valves Interlock



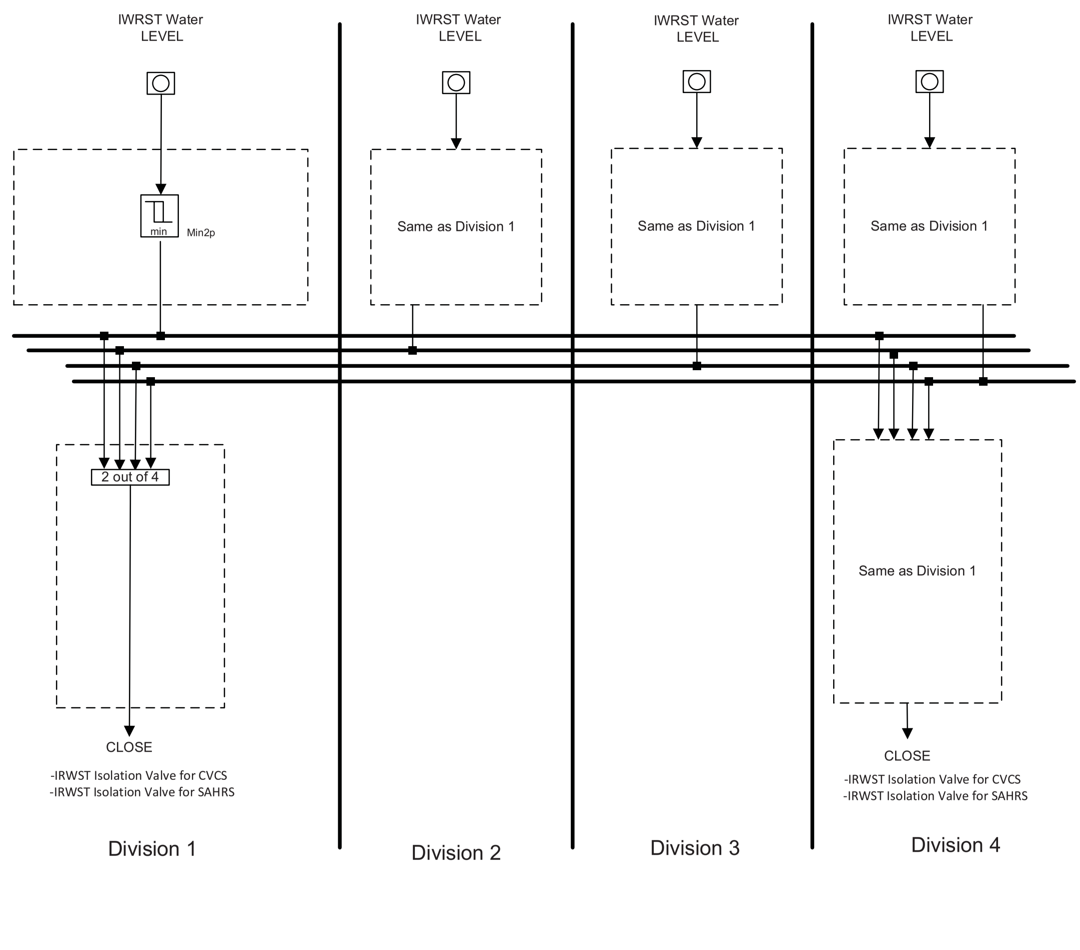
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.6-3—Detection of RHR Connected Interlock



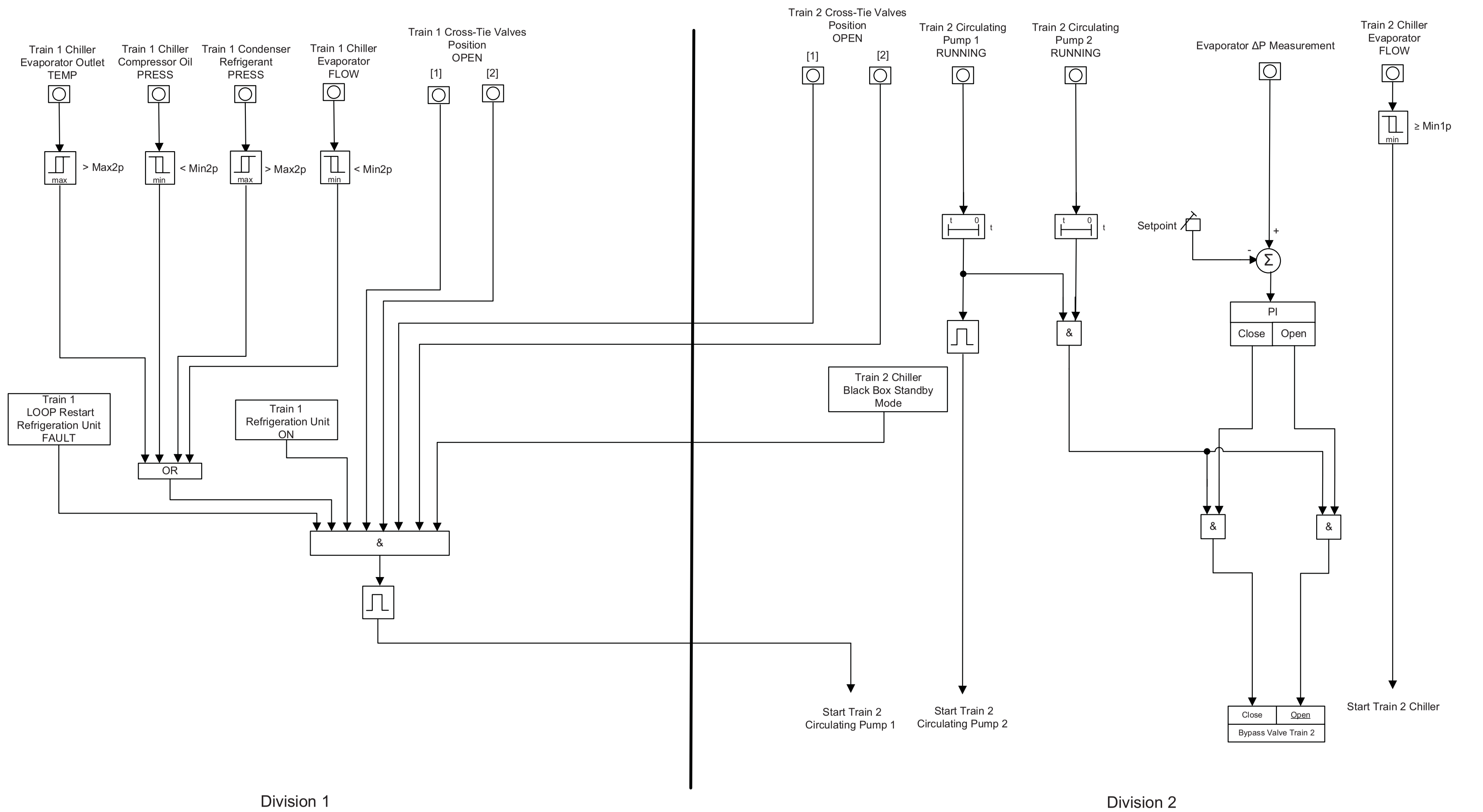
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.6-4—IRWSTS Boundary Isolation for Preserving IRWST Water Inventory Interlock



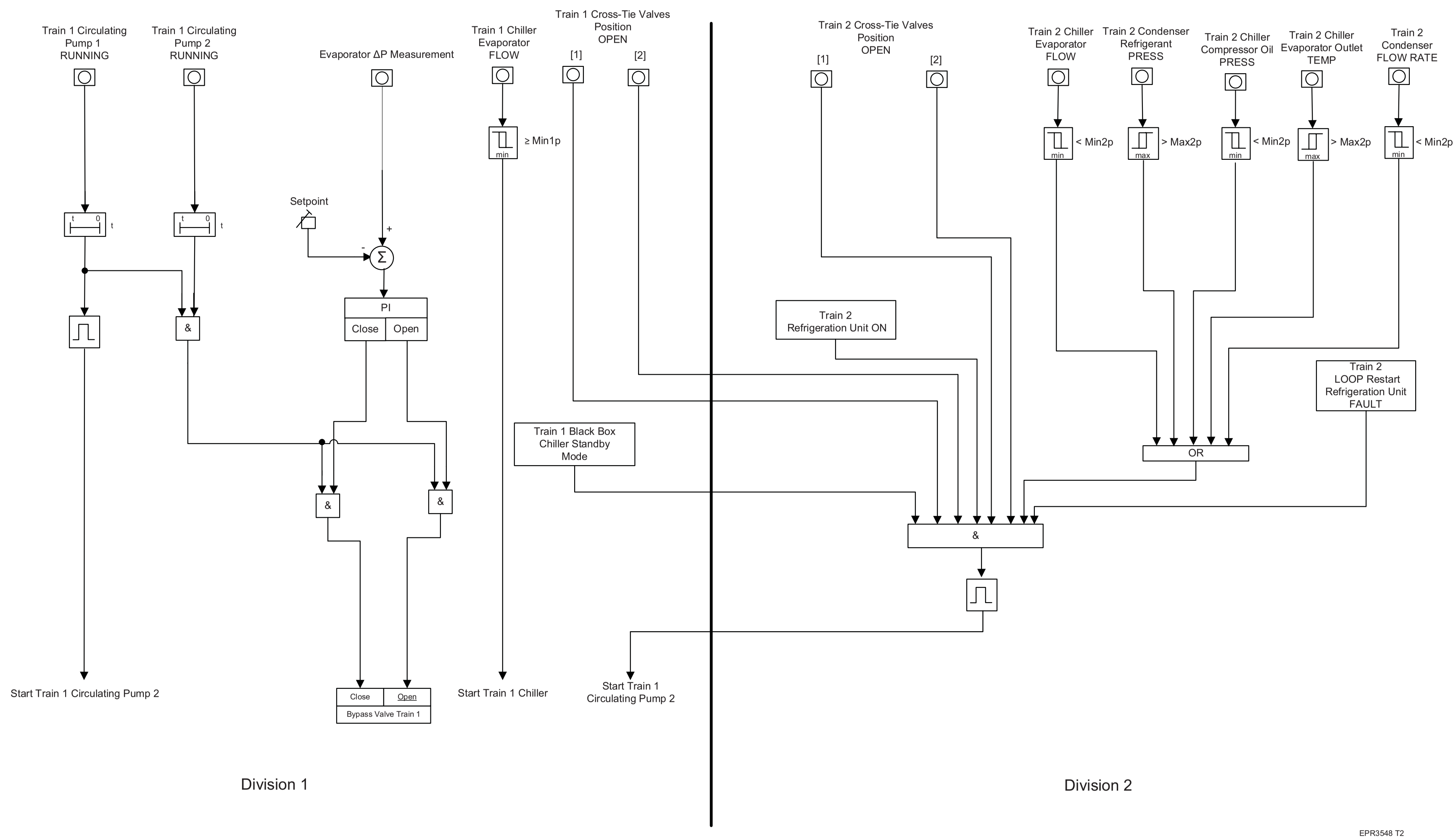
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.6-5—SCWS Train 1 to Train 2 Switchover on Train 1 Low Evaporator Flow / Chiller Blackbox Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock



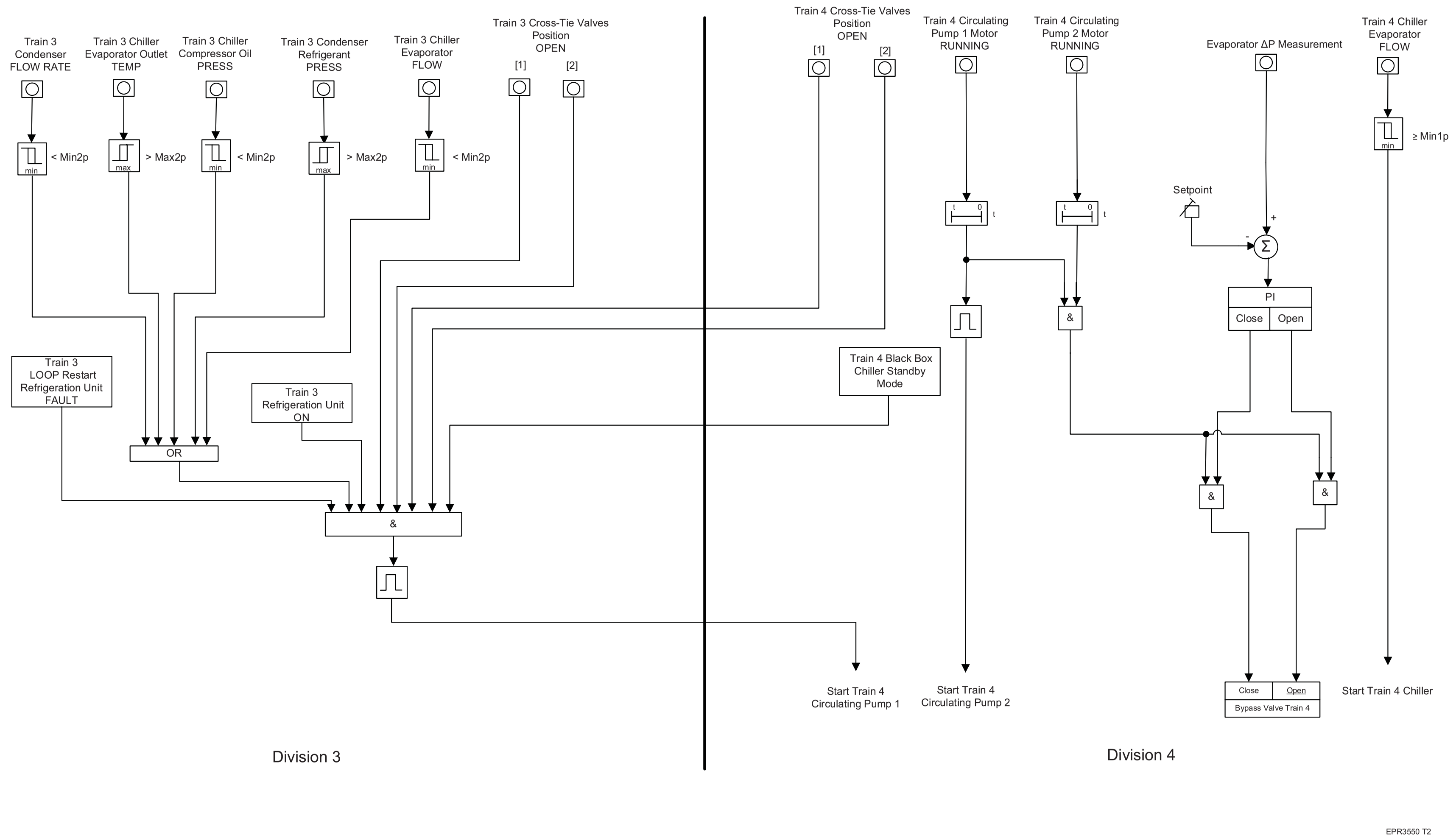
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.6-6—SCWS Train 2 to Train 1 Switchover on Train 2 Low Evaporator Flow / Chiller Blackbox Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock



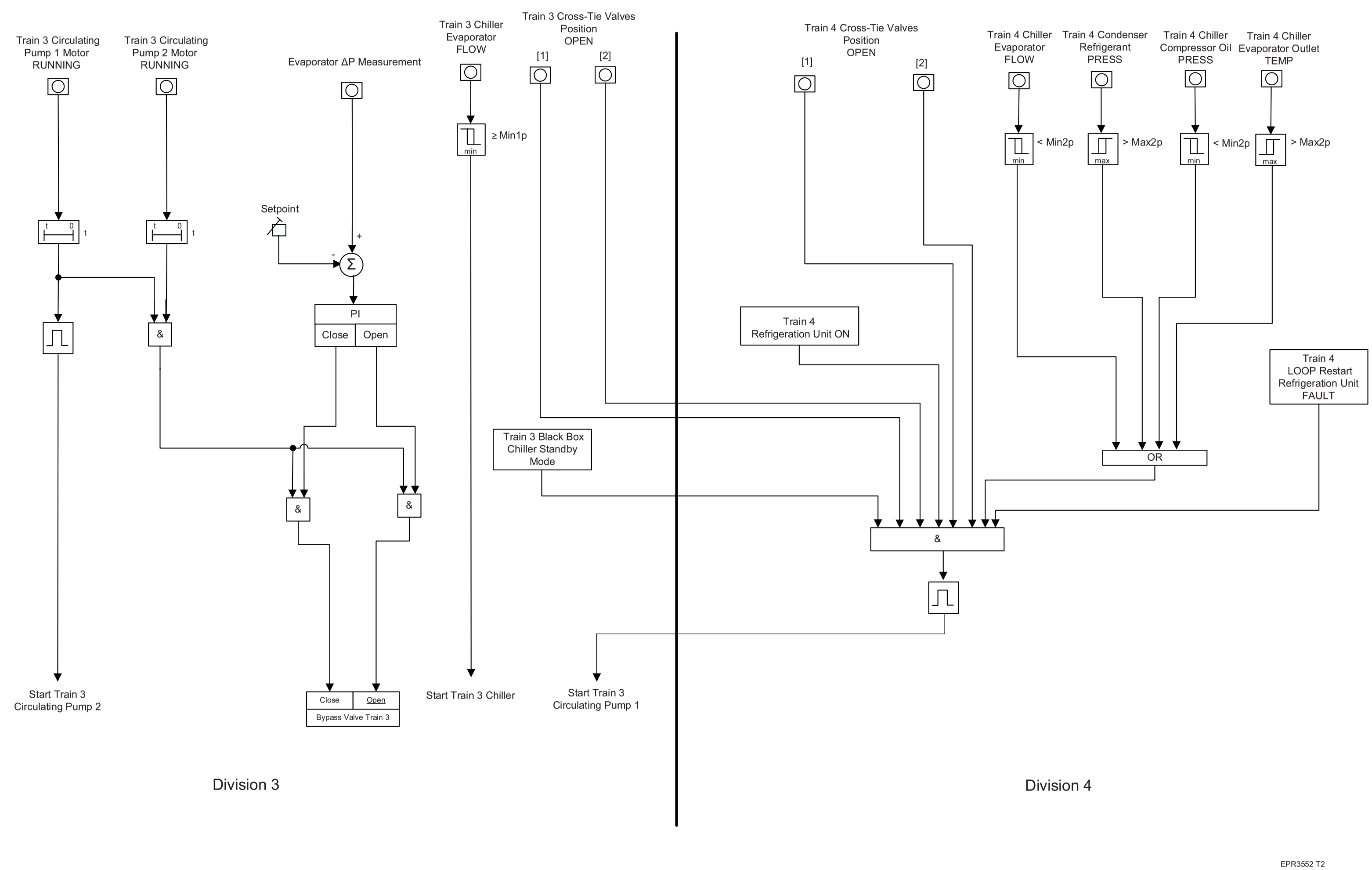
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.6-7—SCWS Train 3 to Train 4 Switchover on Train 3 Low Evaporator Flow / Chiller Blackbox Internal Fault / Loss of UHS-CCWS / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock



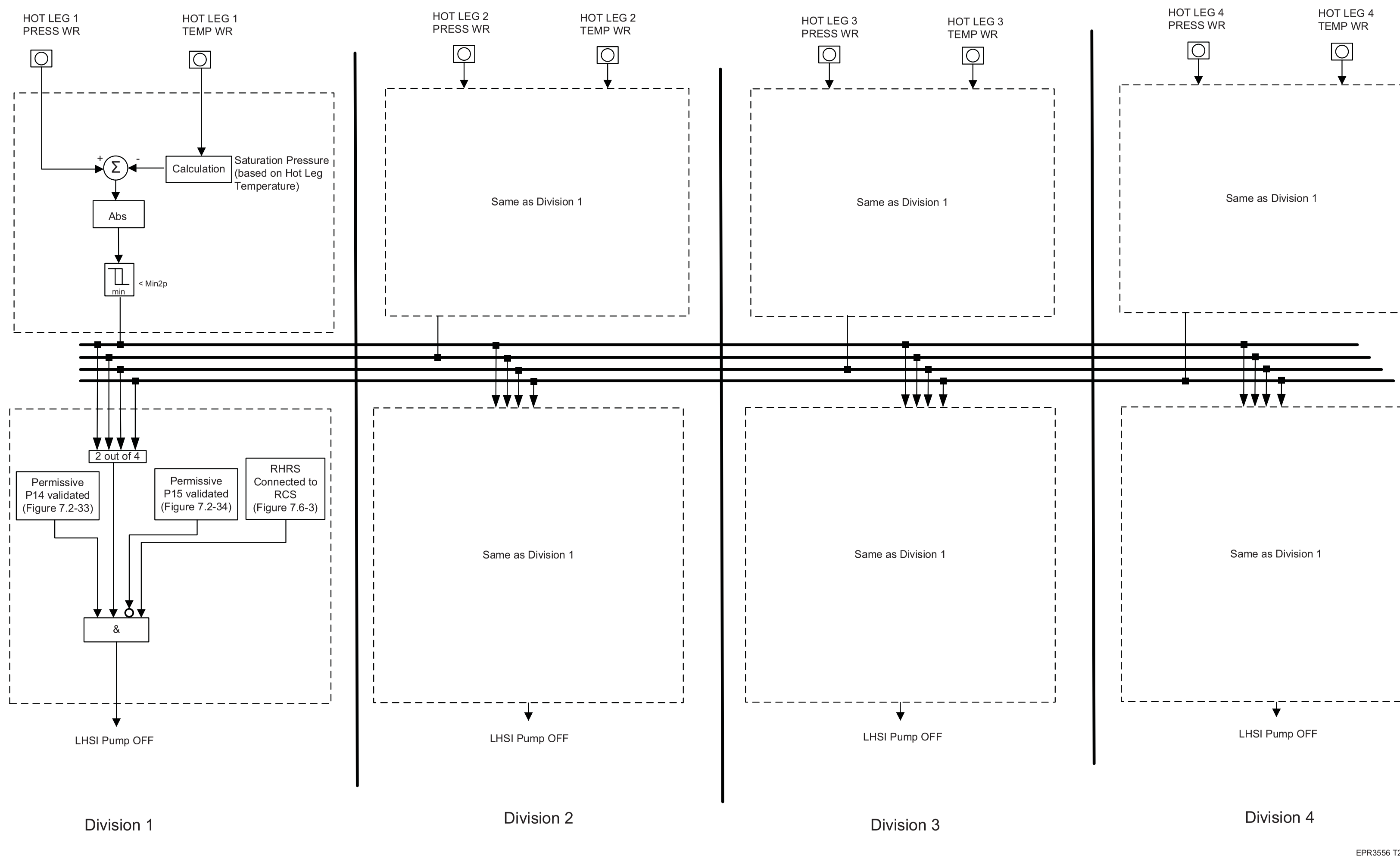
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.6-8—SCWS Train 4 to Train 3 Switchover on Train 4 Low Evaporator Flow / Chiller Blackbox Internal Fault / SCWS Chiller Evaporator Water Flow Control / LOOP Re-Start Failure Interlock



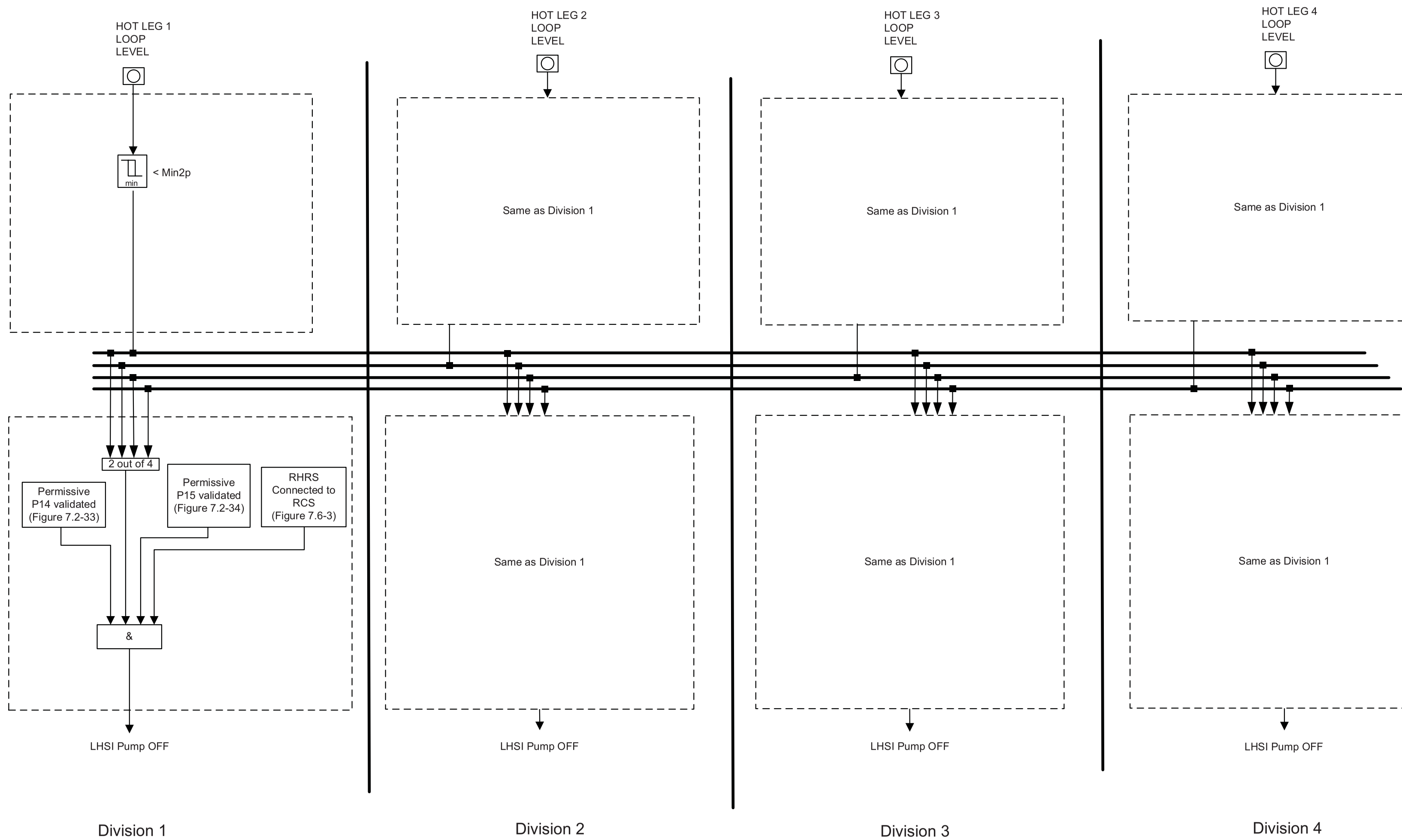
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.6-9—SIS / RHRS Automatic Trip of LHSI Pump (in RHR Mode) on Low ΔPsat Interlock



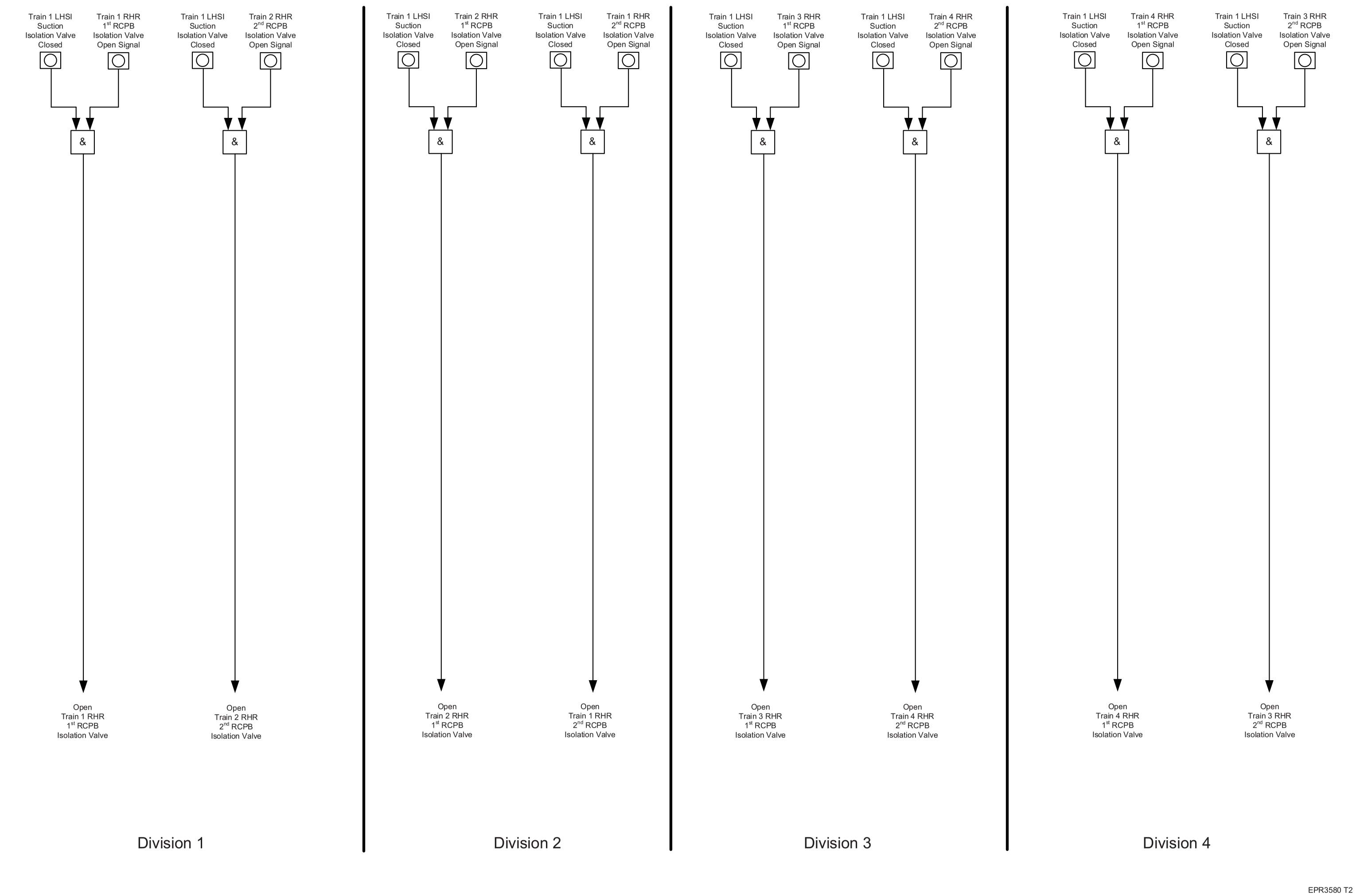
All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.6-10—SIS / RHRS Automatic Trip of LHSI Pump (in RHR Mode) on Low-Low RCS Loop Level Interlock



All indicated changes are in response to RAI 505, Question 07.01-35

Figure 7.6-11—RHR Isolation Valves Interlock



All indicated changes are in response to RAI 505, Question 07.01-35

Table 8.3-4—Division 1 Emergency Diesel Generator Nominal Loads
Sheet 1 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
Load Step Group 1						
0	Start Signal					
15	EDG reaches rated speed and voltage/output breaker closes					
~~15~~	~~Emergency power generating building electric room chiller unit~~	~~480~~	~~18.5 kW~~		~~18.5~~	~~18.5~~
15	Emergency power generating building electric room supply fan	480	10 Bhp		8.3	8.3
15	Emergency power generating building fuel oil storage tank room fan	480	13.4 Bhp		11.1	11.1
15	EDG starting air compressor	480	61 Bhp		50.6	50.6
15	EDG auxiliary loads	480	9.7 kW		9.7	9.7
15	Vent stack monitoring	480	13 kW		13	13
15	Division 1 EUPS battery charger (4)	480	106 kW		106	106
15	Annulus ventilation heating unit	480	6 kW		4.2 (2)	4.2 (2)
15	Annulus ventilation fan	480	4.3 Bhp		3.6	3.6
15	KAA/LAR valve room cooling fan	480	5 Bhp		4.1	4.1
15	Extra boration room cooling fan	480	14 Bhp		11.6	11.6
15	Fuel pool cooling punp room cooling fan	480	7.75 Bhp		6.4	6.4
15	Fuel pool cooling punp room cooling fan	480	7.75 Bhp		6.4	6.4
15	Fuel building ventilation heating unit (7)	480	15 kW		0	0

All indicated changes are in response to RAI 505, Question 07.01-35

Table 8.3-4—Division 1 Emergency Diesel Generator Nominal Loads
Sheet 2 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Safety chilled water pump (6)	480	100 Bhp		82.9	82.9
15	Safety chilled water pump (6)	480	100 Bhp		82.9	82.9
15	Safety chiller condenser fans	480	240 kW		240	240
15	Main control room air conditioning fan	480	27 Bhp		22.4	22.4
15	Main control room air conditioning filtration unit heater (11)	480	10 kW			7 (2)
15	Main control room air conditioning iodine filtration fan (11)	480	10 Bhp			8.3
15	Safeguard building ventilation heaters (7)	480	210 kW		0	0
15	Safeguard building ventilation supply fan	480	78 Bhp		64.7	64.7
15	Safeguard building ventilation return fan	480	43 Bhp		35.6	35.6
15	Main control room air conditioning fan	480	27 Bhp	22.4		
15	Safeguard building battery exhaust fan	480	7 Bhp		5.8	5.8
15	Emergency feed water room ventilation recirculation fan	480	2 Bhp		1.7	1.7
15	Emergency lighting panels (18)	480	165.7 kW		165.7	165.7
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1

All indicated changes are in response to RAI 505, Question 07.01-35

Table 8.3-4—Division 1 Emergency Diesel Generator Nominal Loads
Sheet 5 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Emergency power generating building supply fan 2	480	100 hp		82.9	82.9
15	Emergency power generating building exhaust fan 1	480	75 hp		62.2	62.2
15	Emergency power generating building exhaust fan 2	480	75 hp		62.2	62.2
15	Additional connected loads	480	90.9 kW		90.9	90.9
15	Load contribution from transformer and cable losses		160 kW	40	120	120
Subtotal Load Step Group 1				~~447.3~~469.7 (10)	~~1640.5~~1622.0	~~1678.0~~1659.5
Load Step Group 2 (17)						
20	MHSI pump	6.9 kV	700 hp			580
Subtotal Load Step Group 2						580
Load Step Group 3 (17)						
25	LHSI pump	6.9 kV	500 hp			414
Subtotal Load Step Group 3						414
Load Step Group 4 (14)						
30	CCW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 4					1036	1036
Load Step Group 5 (14)						
35	ESW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 5					1036	1036

All indicated changes are in response to RAI 505, Question 07.01-35

Table 8.3-4—Division 1 Emergency Diesel Generator Nominal Loads Sheet 6 of 6

Time Seq. (s) [13]	Load Description [8] [15] [19]	Volts	Rating (hp/kW) [3]	Alternate Feed Load (kW) [1] [12]	Operating Load LOOP (kW) [1] [12]	Operating Load DBA/ LOOP (kW) [1] [12]
Load Step Group 6 [14]						
40	EFW pump	6.9 kV	700 hp		[5]	580
Subtotal Load Step Group 6					[5]	580
Load Step Group 7 [14]						
45	Division 1 safety chilled water compressor	6.9 kV	900 kW		1000	1000
Subtotal Load Step Group 7					1000	1000
Load Step Group 8 [14]						
50	Essential service water UHS fan 1	480	250 hp		207.2	207.2
50	Essential service water UHS fan 2	480	250 hp		207.2	207.2
Subtotal Load Step Group 8					414.4	414.4
Subtotal Alternate Feed Loads				~~447.3~~469.7		
Total Automatically Sequenced Loads without alternate feed installed					5108.7~~5127.2~~	6721.0~~6739.5~~
Total Automatically Sequenced Loads with alternate feed installed					5578.4~~5574.5~~	7190.7~~7186.5~~
Additional Manually Connected Loads						
	Emergency pressurizer heaters [16]	480	144 kW		144	
	Extra boration pump	480	163 Bhp		0 [20]	0 [20]
	Fuel pool cooling pump [21]	480	137 Bhp		113.6	113.6
Total Manually Connected Loads					257.6	113.6
Total Division 1 EDG Loading					5835.9~~5832.1~~	7304.3~~7300.4~~

All indicated changes are in response to RAI 505, Question 07.01-35

Table 8.3-5—Division 2 Emergency Diesel Generator Nominal Loads
Sheet 1 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
Load Step Group 1						
0	Start Signal					
15	EDG reaches rated speed and voltage/output breaker closes					
~~15~~	~~Emergency power generating building electric room chiller unit~~	~~480~~	~~18.5 kW~~		~~18.5~~	~~18.5~~
15	Emergency power generating building electric room supply fan	480	10 Bhp		8.3	8.3
15	Emergency power generating building fuel oil storage tank room fan	480	13.4 Bhp		11.1	11.1
15	EDG starting air compressor	480	61 Bhp		50.6	50.6
15	EDG auxiliary loads	480	9.7 kW		9.7	9.7
15	Main control room air conditioning fan	480	27 Bhp		22.4	22.4
15	MHSI/LHSI room recirculation fan	480	5 Bhp		4.1	4.1
15	Main control room air conditioning heaters (7)	480	21 kW		0	0
15	Division 2 EUPS battery charger (4)	480	106 kW		106	106
15	Reactor building ventilation filtration fan	480	10 Bhp		8.3	8.3
15	KAA/LAR valve room cooling fan	480	5 Bhp		4.1	4.1
15	Safety chilled water pump (6)	480	100 Bhp		82.9	82.9
15	Safety chilled water pump (6)	480	100 Bhp		82.9	82.9
15	Safeguard building ventilation heaters (7)	480	180 kW		0	0

Table 8.3-6—Division 3 Emergency Diesel Generator Nominal Loads Sheet 1 of 6

Time Seq. (s) [13]	Load Description [8] [15] [19]	Volts	Rating (hp/kW) [3]	Alternate Feed Load (kW) [1] [12]	Operating Load LOOP (kW) [1] [12]	Operating Load DBA/ LOOP (kW) [1] [12]
Load Step Group 1						
0	Start Signal					
15	EDG reaches rated speed and voltage/output breaker closes					
~~15~~	~~Emergency power generating building electric room chiller unit~~	~~480~~	~~18.5 kW~~		~~18.5~~	~~18.5~~
15	Emergency power generating building electric room supply fan	480	10 Bhp		8.3	8.3
15	Emergency power generating building fuel oil storage tank room fan	480	13.4 Bhp		11.1	11.1
15	EDG starting air compressor	480	61 Bhp		50.6	50.6
15	EDG auxiliary loads	480	8.7 kW		8.7	8.7
15	Main control room air conditioning fan	480	27 Bhp		22.4	22.4
15	MHSI/LHSI room recirculation fan	480	5 Bhp		4.1	4.1
15	Main control room air conditioning heaters [7]	480	21 kW		14.7[2]	14.7[2]
15	Division 3 EUPS battery charger [4]	480	106 kW		106	106
15	KAA/LAR valve room cooling fan	480	5 Bhp		4.1	4.1
15	Safety chilled water pump [6]	480	100 Bhp		82.9	82.9
15	Safety chilled water pump [6]	480	100 Bhp		82.9	82.9
15	Safeguard building ventilation heaters	480	180 kW		0	0
15	Safeguard building ventilation supply fan	480	72 Bhp		59.7	59.7

Table 8.3-5—Division 2 Emergency Diesel Generator Nominal Loads Sheet 5 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Additional connected loads	480	84.4 kW		84.4	84.4
15	Lighting (18)	480	300 kW		300	300
15	Reserved for special use (18)	480	125 kW		125	125
15	Load contribution from transformer and cable losses		160 kW	40	120	120
Subtotal Load Step Group 1				647.2 (10)	1619.0~~1637.5~~	1619.0~~1637.5~~
Load Step Group 2 (17)						
20	MHSI pump	6.9 kV	700 hp			580
Subtotal Load Step Group 2						580
Load Step Group 3 (17)						
25	LHSI pump	6.9 kV	500 hp			414
Subtotal Load Step Group 3						414
Load Step Group 4 (14)						
30	CCW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 4					1036	1036
Load Step Group 5 (14)						
35	ESW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 5					1036	1036
Load Step Group 6 (14)						
40	EFW pump	6.9 kV	700 hp		(5)	580
Subtotal Load Step Group 6					(5)	580

All indicated changes are in response to RAI 505, Question 07.01-35

**Table 8.3-5—Division 2 Emergency Diesel Generator Nominal Loads
Sheet 6 of 6**

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
Load Step Group 7 (14)						
45	Division 2 safety chilled water compressor	6.9 kV	900 kW		1000	1000
Subtotal Load Step Group 7					1000	1000
Load Step Group 8 (14)						
50	Essential service water UHS fan 1	480	250 hp		207.2	207.2
50	Essential service water UHS fan 2	480	250 hp		207.2	207.2
Subtotal Load Step Group 8					414.4	414.4
Subtotal Alternate Feed Loads				647.2		
Total Automatically Sequenced Loads without alternate feed installed					5105.6~~5124.1~~	6680.5~~6699.0~~
Total Automatically Sequenced Loads with alternate feed installed					5752.9~~5771.4~~	7327.8~~7346.3~~
Additional Manually Connected Loads						
	Extra boration pump	480	163 Bhp	0 (20)		
	Fuel pool cooling pump (21)	480	137 Bhp	113.6		
	Emergency pressurizer heaters (16)	480	144 kW		144	
Total Manually Connected Loads				113.6	144	
Total Division 2 EDG Loading					6010.4~~6028.9~~	7441.3~~7459.8~~

Notes:

1. The kW rating derived from hp rating multiplied by 0.746 conversion factor. Indicated hp is considered rated. Where brake horsepower (Bhp) is indicated, this is from the system mechanical requirements.

2. A diversity factor of 0.7 is assumed in load contribution due to cyclical nature of load.

Table 8.3-7—Division 4 Emergency Diesel Generator Nominal Loads Sheet 5 of 7

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Safeguard building controlled-area fan	480	9 Bhp			7.5
15	Emergency power generating building supply fan 1	480	100 hp		82.9	82.9
15	Emergency power generating building supply fan 2	480	100 hp		82.9	82.9
15	Emergency power generating building exhaust fan 1	480	75 hp		62.2	62.2
15	Emergency power generating building exhaust fan 2	480	75 hp		62.2	62.2
15	Additional connected loads	480	179.8 kW		179.8	179.8
15	Load contribution from transformer and cable losses		160 kW	40	120	120
Subtotal Load Step Group 1				495.7 (10) ~~473.3~~	1725.4 ~~1743.9~~	1790.0 ~~1808.5~~
Load Step Group 2 (17)						
20	MHSI pump	6.9 kV	700 hp			580
Subtotal Load Step Group 2						580
Load Step Group 3 (17)						
25	LHSI pump	6.9 kV	500 hp			414
Subtotal Load Step Group 3						414
Load Step Group 4 (14)						
30	CCW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 4					1036	1036

All indicated changes are in response to RAI 505, Question 07.01-35

Table 8.3-7—Division 4 Emergency Diesel Generator Nominal Loads
Sheet 6 of 7

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
Load Step Group 5 (14)						
35	ESW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 5					1036	1036
Load Step Group 6 (14)						
40	EFW pump	6.9 kV	700 hp		(5)	580
Subtotal Load Step Group 6					(5)	580
Load Step Group 7 (14)						
45	Division 4 safety chilled water compressor	6.9 kV	900 kW		1000	1000
Subtotal Load Step Group 7					1000	1000
Load Step Group 8 (14)						
50	Essential service water UHS fan 1	480	250 hp		207.2	207.2
50	Essential service water UHS fan 2	480	250 hp		207.2	207.2
Subtotal Load Step Group 8					414.4	414.4
Subtotal Alternate Feed Loads				495.7~~447.3~~		
Total Automatically Sequenced Loads without alternate feed installed					5212.1~~5230.6~~	6851.6~~6870.1~~
Total Automatically Sequenced Loads with alternate feed installed					5707.8~~5703.9~~	7347.3~~7343.4~~
Additional Manually Connected Loads						
	Emergency pressurizer heaters (16)	480	144 kW		144	
	Extra boration pump	480	163 Bhp		0 (20)	0 (20)
	Fuel pool cooling pump (21)	480	137 Bhp		113.6	113.6

All indicated changes are in response to RAI 505, Question 07.01-35

Table 8.3-7—Division 4 Emergency Diesel Generator Nominal Loads
Sheet 7 of 7

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
	Severe accident heat removal pump (16)	6.9 kV	400 hp		0 (20)	0 (20)
Total Manually Connected Loads					257.6	113.6
Total Division 4 EDG Loading					5965.3 ~~5961.4~~	7460.8 ~~7457.0~~

Notes:

1. The kW rating derived from hp rating multiplied by 0.746 conversion factor. Indicated hp is considered rated. Where brake horsepower (Bhp) is indicated, this is from the system mechanical requirements.
2. A diversity factor of 0.7 is assumed in load contribution due to cyclical nature of load.
3. Motor efficiencies estimated at 90 percent.
4. One EUPS battery charger is in service with the other battery charger in standby. Contribution to EDG loading is calculated considering only one battery charger.
5. During a LOOP-only EDG loading sequence, the EFW start is prevented until load step group six, which occurs at 30 seconds. At load step six, the start inhibit is removed and the EFW pump start sequence is based on steam generator low level initiation. If a steam generator low level initiation exists, EFW pump start is given priority over subsequent load steps.
   During a LOOP/LOCA condition, the EFW pump is started at the sequence step indicated.
6. The divisional safety chilled water pumps and chiller are assumed operating for EDG loading purposes.
7. Worst case EDG loading occurs during summer operation when safety chilled water loading is highest. Area heater loads are shown, but do not contribute to overall EDG loading since operating conditions where heater operation is expected does not reflect bounding EDG loading scenario.

Table 8.3-7—Division 4 Emergency Diesel Generator Nominal Loads
Sheet 3 of 7

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Component cooling water valve hydraulic pump	480	5 Bhp		4.1	4.1
15	Division 3 EUPS battery charger	480	106 kW	106		
15	KAA/LAR valve room cooling fan	480	5 Bhp	4.1		
15	Safeguard building ventilation heaters (7)	480	180 kW	0		
15	Safeguard building ventilation supply fan	480	72 Bhp	59.7		
15	Safeguard building ventilation return fan	480	43 Bhp	35.6		
15	Main control room air conditioning fan	480	27 Bhp	22.4		
15	Safeguard building battery exhaust fan	480	6 Bhp	5		
15	Emergency feed water ventilation recirculation fan KAA pump room recirculation fan	480	2 Bhp	1.7		
15	KAA pump room recirculation fan	480	2 Bhp	1.7		
15	Emergency lighting panels (18)	480	155.7 kW	155.7		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		
15	Component cooling water valve hydraulic pump	480	5 Bhp	4.1		

All indicated changes are in response to RAI 505, Question 07.01-35

Table 8.3-7—Division 4 Emergency Diesel Generator Nominal Loads
Sheet 1 of 7

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
Load Step Group 1						
0	Start Signal					
15	EDG reaches rated speed and voltage/output breaker closes					
~~15~~	~~Emergency power generating building ventilation chiller unit~~	~~480~~	~~18.5 kW~~		~~18.5~~	~~18.5~~
15	Emergency power generating building electric room supply fan	480	10 Bhp		8.3	8.3
15	Emergency power generating building fuel oil storage tank room fan	480	13.4 Bhp		11.1	11.1
15	EDG starting air compressor	480	61 Bhp		50.6	50.6
15	EDG auxiliary loads	480	8.7 kW		8.7	8.7
15	Vent stack monitoring	480	13 kW		13	13
15	Division 4 EUPS battery charger (13)	480	106 kW		106	106
15	Annulus ventilation heating unit	480	6 kW		4.2 (2)	4.2 (2)
15	Annulus ventilation fan	480	4.3 Bhp		3.6	3.6
15	KAA/LAR valve room cooling fan	480	5 Bhp		4.1	4.1
15	Extra boration room cooling fan	480	14 Bhp		11.6	11.6
15	Fuel pool cooling pump room cooling fan	480	7.75 Bhp		6.4	6.4
15	Fuel pool cooling pump room cooling fan	480	7.75 Bhp		6.4	6.4
15	Fuel building ventilation heating unit (7)	480	15 kW		0	0

Table 8.3-6—Division 3 Emergency Diesel Generator Nominal Loads Sheet 5 of 6

Time Seq. (s) [13]	Load Description [8] [15] [19]	Volts	Rating (hp/kW) [3]	Alternate Feed Load (kW) [1] [12]	Operating Load LOOP (kW) [1] [12]	Operating Load DBA/ LOOP (kW) [1] [12]
15	Reserved for special use [18]	480	125 kW		125	125
15	Lighting [18]	480	300 kW		300	300
15	Load contribution from transformer and cable losses		160 kW	40	120	120
Subtotal Load Step Group 1				689.8 [10]	1644.5 ~~1663.0~~	1644.5 ~~1663.0~~
Load Step Group 2 [17]						
20	MHSI pump	6.9 kV	700 hp			580
Subtotal Load Step Group 2						580
Load Step Group 3 [17]						
25	LHSI pump	6.9 kV	500 hp			414
Subtotal Load Step Group 3						414
Load Step Group 4 [14]						
30	CCW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 4					1036	1036
Load Step Group 5 [14]						
35	ESW pump	6.9 kV	1250 hp		1036	1036
Subtotal Load Step Group 5					1036	1036
Load Step Group 6 [14]						
40	EFW pump	6.9 kV	700 hp		[5]	580
Subtotal Load Step Group 6					[5]	580

Table 8.3-6—Division 3 Emergency Diesel Generator Nominal Loads
Sheet 6 of 6

Time Seq. (s) (13)	Load Description (8) (15) (19)	Volts	Rating (hp/kW) (3)	Alternate Feed Load (kW) (1) (12)	Operating Load LOOP (kW) (1) (12)	Operating Load DBA/ LOOP (kW) (1) (12)
Load Step Group 7 (14)						
45	Division 3 safety chilled water compressor	6.9 kV	900 kW		1000	1000
Subtotal Load Step Group 7					1000	1000
Load Step Group 8 (14)						
50	Essential service water UHS fan 1	480	250 hp		207.2	207.2
50	Essential service water UHS fan 2	480	250 hp		207.2	207.2
Subtotal Load Step Group 8					414.4	414.4
Subtotal Alternate Feed Loads				689.8		
Total Automatically Sequenced Loads without alternate feed installed					5131.1 ~~5149.6~~	6706.0 ~~6724.5~~
Total Automatically Sequenced Loads with alternate feed installed					5821.0 ~~5839.5~~	7395.9 ~~7414.4~~
Additional Manually Connected Loads						
	Extra boration pump	480	163 Bhp	0 (20)		
	Fuel pool cooling pump (21)	480	137 Bhp	113.6		
	Emergency pressurizer heaters (16)	480	144 kW		144	
Total Manually Connected Loads				113.6	144	
Total Division 3 EDG Loading					6078.5 ~~6097.0~~	7509.4 ~~7527.9~~

Notes:

1. The kW rating derived from hp rating multiplied by 0.746 conversion factor. Indicated hp is considered rated. Where brake horsepower (Bhp) is indicated, this is from the system mechanical requirements.

2. A diversity factor of 0.7 is assumed in load contribution due to cyclical nature of load.

section C.2 with regard to provisions for decontamination is provided in Section 12.3.1.

12. The safety-related components and systems of the FPCPS are not shared among nuclear power units (GDC 5).

13. Designed to provide acceptable performance for the environments anticipated under normal, testing, and design basis conditions in compliance with the requirements of 10 CFR 50.49.

9.1.3.2 System Description

9.1.3.2.1 General Description

The FPCPS system is described in following four sections:

- Fuel Building and Reactor Building pools.
- Fuel pool cooling system.
- SFP makeup capability.
- Fuel pool purification system.

9.1.3.2.2 Fuel Building and Reactor Building Pools

The Fuel Building pool (see also the description of the Fuel Building in Section 3.8.4 and the Spent Fuel Storage Facility in Section 9.1.2.2.2) includes the following three compartments:

- The Fuel Building Transfer Compartment is used for transfer of used or new fuel between the Fuel Building and the Reactor Building. This compartment is filled from the in-containment refueling water storage tank (IRWST) before refueling.
- The Cask Loading Pit is filled with water when spent fuel transfer from the pool is required. The water needed to fill this compartment is stored in the Fuel Building Transfer Compartment.
- The SFP is dedicated to the storage and cooling of the spent fuel.

The Reactor Building pool (see also the description of the Reactor Building in Section 1.2 and Section 3.8) includes the following four compartments:

- The Reactor Building transfer compartment is connected to the Fuel Building Transfer Compartment by a transfer tube (see Section 9.1.4), and is used for transfer of used or new fuel between the Fuel Building and the Reactor Building.
- The instrumentation lance compartment is used to store instrumentation (e.g., core outlet thermocouples, in-core detectors, and probes). This compartment remains flooded during all modes of plant operation.

isolation valve (KAA10/20/30/40 AA027) is also closed in order to avoid DW water supply to a train with a leak.

The surge tank level is detected by two redundant analog level measurements.

Switchover Valves Leakage or Failure

In the event of a switchover valve seat leakage or failure and depending upon the difference in pressure between the two CCWS trains, a water transfer could occur. If the water transfer leads to a MAX2 in one of the two associated trains and a MIN3 on the other, the common users are automatically isolated from the safety trains. This action allows both trains to perform their main safety-related function. The function logic is shown on Figure 7.3-36.

Safety Chilled Water Condenser Supply Water Flow Control

The SCWS chillers of Trains 2 and 3 are permanently cooled by one of two associated CCWS common headers. They are isolable from all other associated Common header users by means of manual valves ((KAA22/32AA003/004). They are fitted with a three-way flow control valve (KAA22/32AA101) that is controlled by the chiller condenser pressure. The function logic is shown in Figure 7.3-37.

CCWS Actuation from Safety Injection Signal

Upon receipt of a safety injection signal, the four CCWS trains are started, supplying all SIS pump coolers and the four LHSI heat exchangers. The non-safety-related users outside of the RB are also isolated.

The system response optimizes the CCWS to cool the SIS pumps and LHSI heat exchangers. The following CCWS actuations are automatically initiated:

- Start CCWS pumps (KAA10/20/30/40 AP001), if not previously running.
- Open LHSI HX isolation valves (KAA12/22/32/42 AA005).
- Open LHSI pump seal cooler isolation valves (KAA22/32 AA013).
- Close isolation valves for non-safety related users outside of RB (KAB50 AA001/004/006 & KAB80 AA015/016/019).

Simultaneous operation of LHSI heat exchanger isolation valves (opening) and non-safety-related user isolation valves (closing) maintains pump operation in a safe range.

A safety injection signal initiates a concurrent containment isolation Stage 1 signal.

CREF (Iodine Filtration) Train Subsystem

The CREF (iodine filtration) train subsystem is illustrated in Figure 9.4.1-1.

The train 1 outside air inlet duct and train 1 CREF (iodine filtration) train is located in Safeguard Building 2. The train 4 outside air inlet duct and train 4 CREF (iodine filtration) train is located in Safeguard Building 3. Each CREF (iodine filtration) train pulls air from its respective outside air inlet. The outside inlet air for each CREF is ducted to allow the CREF (iodine filtration) train to operate in the filtered or the unfiltered (bypass) alignment.

In the CREF filtered alignment, a maximum of 1000 cfm of outside air mixes with 3000 cfm of CRE recirculated air and is pulled through the CREF (iodine filtration) train by the CREF booster fan and delivers this air to the common recirculation plenum. In the filtered alignment, the filter bypass duct has two motor-operated bypass dampers in series. In the filtered alignment both of these dampers close to provide redundancy and single-failure protection to prevent the outside air from bypassing the CREF (iodine filtration) trains.

In the CREF unfiltered (bypass) alignment, the CREF filtration unit inlet, outlet and CRE recirculation dampers are all closed and both bypass dampers are open. The outside unfiltered air bypasses the CREF iodine filtration unit. In the unfiltered (bypass) alignment, the outside air flows through a prefilter and a preheater that is temperature controlled. The outside air then flows through ducting and is pulled into the common recirculation plenum. In this unfiltered (bypass) alignment, the CREF booster fan does not operate and outside air is pulled into the common recirculation plenum by the CRACS air handling units.

Air Conditioning and Recirculation Air Handling Subsystem

The air conditioning and recirculation air handling subsystem is illustrated in Figure 9.4.1-2—Control Room Air Conditioning and Recirculation Air Handling Subsystem.

There are four recirculation air handling units located in Safeguard Buildings 2 and 3 (two trains in each building). Recirculated and fresh air is processed through these air handling units and supplied to a common supply air plenum. Each train includes an isolation damper, a volume control manual damper, a cooling coil, a moisture separator, fan suction and discharge silencers, a supply air fan, a HEPA filter, and a non-return damper. The cooling coil is supplied with chilled water from the safety chilled water system (SCWS).

During normal and emergency operation, each CRACS cooling unit provides 50 percent of the cooling for the rooms within the CRE. ~~However, each CRACS air handling unit is capable of cooling up to 75 percent~~ Each CRACS air handling unit is

designed for 50 percent cooling of the normal and emergency cooling load to allow a single CRACS air handling unit to cool the CRE rooms during a station blackout (SBO) event. During an SBO, the single CRACS air handling unit prevents the CRE room temperature from exceeding 104°F.

The air conditioning system for the CRE area operates in the recirculation mode with fresh air makeup. The fresh air flow rate corresponds to the exhaust of kitchens and restrooms and the leakage rate in the CRE area due to controlled overpressure. The exhaust from the kitchen and restrooms is directed to the electrical division of the SB ventilation system (SBVSE) air outlet duct (refer to Section 9.4.6).

CRE Air Supply and Recirculation Subsystem

The CRE air supply and recirculation subsystem is illustrated in Figure 9.4.1-3—Control Room Envelope Air Supply and Recirculation Subsystem.

The common supply air plenum receives air from the operating CRACS air handling units and provides conditioned air to the CRE areas through the duct distribution network. Electric air heaters are installed in the supply air ducts to maintain individual room temperatures. The exhaust air from the CRE area, except from the kitchen and restrooms, flows through the recirculation air handling units. The exhaust from kitchen and restrooms is separated from the recirculated return air and is processed separately through the SBVSE.

9.4.1.2.2 Component Description

The major components of the CRACS are listed below, along with the applicable codes and standards. Table 3.2.2-1 provides the seismic design and other design classifications for components in the CRACS.

Ductwork and Accessories

The main supply and exhaust air plenums are constructed of concrete with painted surfaces. The air supply and exhaust duct branches for each area are fed from the main supply and exhaust air plenum. These ducts are constructed of galvanized sheet steel and are structurally designed for fan shutoff pressures. The ductwork meets the design, testing and construction requirements per ASME AG-1 (Reference 1).

Electric Heaters (Duct Heaters)

The electric heaters (duct heaters) are installed in the supply duct to maintain room ambient conditions. These are controlled by local room temperature sensors and control circuits. The heaters meet the requirements of Reference 1.

Cooling Coils and Moisture Separator

The cooling coils are of the finned tube, coil type and are connected to the safety chilled water system (SCWS). The cooling coils have a total cooling capacity of 470,000 Btu/hr and are designed in accordance with Reference 1. The moisture separator collects condensate which is directed to the drain system.

9.4.1.2.3 System Operation

Normal Plant Operation

~~During normal plant operation, fresh air is admitted via air intake trains 1 and 4. The fresh air passes through the unfiltered bypass duct and bypass dampers. The fresh air passes through a prefilter, electrical heaters, and then mixes with the recirculated air from the CRE area.~~

During normal plant operation, fresh air is admitted via air intake trains 1 and 4. The fresh air passes through the unfiltered bypass duct and bypass dampers. The fresh air is then mixed with the recirculated air from the CRE area, and the mixed air passes through a prefilter and electrical heater. Two sets of temperature sensors are located downstream of the electrical heater. One temperature sensor turns on the heater when the air inlet temperature drops below 37°F; the other temperature sensor turns off the heater when the air inlet temperature reaches 50°F.

The fresh and recirculated air is admitted through two of four air handling units which provide heating and cooling of the supply air. The conditioned air is then distributed through a ductwork distribution network to the CRE area. The room air conditioning is provided by the supply and exhaust air flows based on minimum air renewal rate, equipment and personnel heat loads and heat balance between the rooms.

Heating of air streams is provided by electric heaters located in the supply air ducts. The operation of heaters is automatically controlled by the temperature sensors located in the corresponding rooms.

The CRE area is maintained at a pressure above atmospheric pressure to provide habitability in the event of radioactive contamination of the environment.

Both CREF (iodine filtration) trains are isolated with outside air bypassing the CREF (iodine filtration) trains. The CREF iodine filtration train inlet and outlet motor operated isolation dampers are closed. In addition, the CRE recirculation motor operated isolation damper is closed to prevent the recirculation of air from the CRE rooms.

The air conditioning system for the CRE area operates in the recirculation mode with fresh air makeup. During the recirculation mode, the fresh air supply rate is equal to

the rate of exhaust air from the kitchens and restrooms plus accounting for the leakage rate in the area due to controlled overpressure.

Exhaust air from the kitchen and restrooms is not recirculated. During normal operation, air is exhausted from the restrooms and the kitchen area to the SBVSE CREF (iodine filtration) air outlet. The CRACS has design features which will allow it to continue to maintain a minimum positive pressure of 0.01 inch water gauge in the CRE. Approximately twice as much outside air is supplied to the CRE during normal operation compared to operation during accident conditions. Each train of the CRACS is equipped with a pressure control damper. This damper will open and close as required to increase or decrease the amount of outside air that enters the control room. During normal operation, air is exhausted from the restrooms and the kitchen area through a small throttle damper that minimizes the open CRE boundary area.

Abnormal Operating Conditions

Redundancy of air supply and air conditioning trains is provided. A loss of function or power to any single train or component does not affect overall system operation. The train separation and independent power source limit common mode failure of active multiple trains and abnormal operating conditions.

Loss of a single CRACS air conditioning train will not result in a loss of system functional capability because only two of the four cooling trains are required to operate for both normal and accident operation. The CREF (iodine filtration) trains do not operate during normal plant operation, but loss of a single CREF (iodine filtration) train during any design basis accident will not result in a loss of iodine filtration capability because two CREF (iodine filtration) trains are provided.

Loss of Coolant Accident

Upon receipt of a containment isolation signal, the following functions are initiated automatically:

- Opens Control Room Emergency Filtration (CREF) iodine filtration trains isolation dampers.
- Closes CREF iodine filtration trains bypass dampers.
- Opens Control Room Envelope (CRE) recirculation dampers to provide clean air and positive pressurization for the rooms within the CRE.

Loss of Offsite Power

During loss of offsite power (LOOP), the air intake and air conditioning and recirculation air handling electrical components located inside SB division two receive power for one train from the emergency diesel generators (EDG) of division two, and

Prior to opening the equipment hatch during an outage, the air supply and exhaust for the equipment area in front of the hatch are isolated by closing the dampers dedicated to this area.

Loss of Coolant Accident (LOCA)

Upon receipt of a containment isolation signal, the following functions are initiated automatically:

- Closes FBVS exhaust air isolation dampers to NABVS.
- Closes FBVS supply air isolation dampers from NABVS.
- Opens FBVS exhaust air isolation dampers to exhaust air from the entire Fuel Building to the SBVS.
- Opens isolation dampers for the SBVS Accident Exhaust Iodine Filtration Trains.
- Starts SBVS iodine filtration train fans to pull air through SBVS Accident Exhaust Iodine Filtration Trains and to direct exhaust air to the vent stack. The SBVS maintains negative pressure in the Fuel Building.

~~In the event of LOCA, the containment isolation signal or high radiation signal in the RB initiates isolation of the FB from NABVS supply and exhaust duct to limit leakage into the FB. The SBVS maintains negative pressure in the FB and exhaust air from the FB is directed to the SBVS iodine filtration trains.~~

Loss of Offsite Power (LOOP)

Upon loss of offsite power, all motorized dampers will fail as is, limiting pathways for potentially contaminated air to leak out to the environment.

The following equipment will remain operational during LOOP:

- Electric heaters in the extra borating pump rooms and pipe chase.
- Recirculation cooling units in the fuel pool cooling system pump rooms, and extra borating system pump rooms.
- Dampers for isolating the fuel pool room and FB.

The power for the equipment listed above is supplied from the corresponding emergency diesel generators.

Station Blackout (SBO)

In the event of SBO, the following equipment will remain operational:

- Electric heaters in the extra borating system pump rooms and pipe chase.

are designed to provide adequate outside air to meet the distribution requirements of supply air under design conditions of the plant.

The air intake plenum supplies air through three filtration trains. Each train consists of a preheater, prefilter, cooling coil, heater, silencer, ~~humidifier,~~ and air dampers. Four supply air fans take suction from the supply fan inlet plenum and supply air to the outlet air shaft for further distribution to the supply shafts of different buildings.

The design supply air flow to serve the NAB, FB, annulus ventilation system, and Containment Building would require all three trains to be in operation. However, during normal operation, a reduced air flow rate can be used that requires only one supply train to be in operation.

Nuclear Auxiliary Building Air Supply Subsystem

This subsystem supplies air to the NAB to maintain ambient conditions within the prescribed limits for equipment operation and personnel access. See Figure 9.4.3-2—Nuclear Auxiliary Building Air Supply and Exhaust Subsystem.

The conditioned air is supplied to all levels of the building through air shaft cells and a duct distribution network. The flow rate to each room is calculated based on the room volume and equipment heat loads to maintain ambient conditions. The normal operation of the system is to maintain a negative pressure in the building with respect to the outside atmosphere to prevent leakage of potentially contaminated air to the environment. The air flow paths within the NAB are designed so that if radiation is detected, migration of contaminated air from areas of potentially high radioactivity to areas of potentially low radioactivity is limited.

The recirculation cooling units are provided for the rooms with high heat loads. Cooling coil units with fans provide recycled cooled air to the rooms where vapor compressors, electrical switchgear, and transformers are located.

Exhaust Air Subsystem

This subsystem processes exhaust air through filtration trains and charcoal filtration trains to limit airborne radioactivity released through the vent stack. See Figure 9.4.3-3—Nuclear Auxiliary Building Exhaust Filtration Trains Subsystem.

The system processes air exhaust from the following areas:

- FB Cell 5 exhaust (refer to Section 9.4.2).
- FB Cell 4 exhaust (refer to Section 9.4.2).
- NAB Cell 3 exhaust, including annulus exhaust.

are designed to provide adequate outside air to meet the distribution requirements of supply air under design conditions of the plant.

The air intake plenum supplies air through three filtration trains. Each train consists of a preheater, prefilter, cooling coil, heater, silencer, ~~humidifier,~~ and air dampers. Four supply air fans take suction from the supply fan inlet plenum and supply air to the outlet air shaft for further distribution to the supply shafts of different buildings.

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This subsystem processes exhaust air through filtration trains and charcoal filtration trains to limit airborne radioactivity released through the vent stack. See Figure 9.4.3-3—Nuclear Auxiliary Building Exhaust Filtration Trains Subsystem.

The system processes air exhaust from the following areas:

- FB Cell 5 exhaust (refer to Section 9.4.2).
- FB Cell 4 exhaust (refer to Section 9.4.2).
- NAB Cell 3 exhaust, including annulus exhaust.

Heaters

Supply air trains have hot water heaters. The heater design is based on the minimum outside air design temperature and supply air temperature requirements. The coils are constructed and tested in accordance with Reference 1. Electric heaters are located upstream of iodine filters to prevent excessive moisture accumulation in the charcoal beds.

~~Humidifiers~~

~~Humidifiers add moisture to the supply air as needed to maintain acceptable ambient conditions. The design of humidifiers is based on the outside air design conditions and supply air humidity requirements.~~

Prefilters

The prefilters are located upstream of HEPA filters and collect large particles to increase the useful life of the high efficiency filters. The prefilters will meet the requirements of ANSI/ASHRAE Standard 52.2-1999 (Reference 2).

HEPA Filters

HEPA filters are constructed, qualified and tested in accordance with Reference 1. The periodic in-place testing of HEPA filters to determine the leak-tightness is performed per ASME N510-1989 (Reference 3).

Adsorbers

Carbon filters are used to remove radioactive iodine from the exhaust air. The efficiency for removal of methyl iodine is based on the decontamination efficiency assigned during the laboratory tests. The periodic in-place testing of the adsorbers to determine the leak-tightness is performed per Reference 3. The activated carbon total bed depth requirement will be 2 inches with a maximum assigned activated carbon decontamination efficiency of 95 percent.

Fans

The supply and exhaust fans are centrifugal or vane-axial design with electrical motor drivers. Fan performance is rated in accordance with ANSI/AMCA-210-99 (Reference 4), ANSI/AMCA-211-1987 (Reference 5) and ANSI/AMCA-300-1985 (Reference 6).

Isolation Dampers

The isolation dampers are located upstream and downstream of each filtration train. The motor-operated dampers will fail to “close” or “open” position in case of loss of power, depending on the safety function of the dampers. The performance and testing

Section 9.4.3).

- Accident Air Exhaust Mode–If airborne contamination is detected in any of the four hot mechanical areas of the SBs or there is a containment isolation signal, the SBVS will automatically direct the exhaust air (accident exhaust) via four separate exhaust air ducts and isolation dampers to one common concrete duct in the annulus. This exhaust duct connects to two accident iodine exhaust filtration trains located in the FB. The exhaust air is processed through one of two redundant and independent iodine filtration trains prior to release through the plant stack. Each iodine filtration train includes inlet and outlet dampers, moisture separator, two stage electric heater, inlet and outlet high efficiency particulate air (HEPA) filters, carbon adsorber, exhaust fan, and backdraft damper. The fans direct the exhaust air to the plant stack.

In case of a fuel handling accident in the FB, the accident exhaust air from these buildings is directed and filtered through the SBVS iodine exhaust filtration trains located in the FB, and released through the plant stack.

In case of containment isolation signal, the SBVS maintains a negative pressure and filters all areas of the FB and the hot mechanical area of the SB in addition to performing the SBVS accident air exhaust filtration function.

The supply and exhaust duct network of the hot mechanical area in the SBs is equipped with isolation dampers to isolate the following areas from the other rooms:

- Rooms where safety injection and residual heat removal system components in divisions one and four are installed.
- Rooms where severe accident heat removal system components in division four are installed.
- Personnel air lock area in division two.

Recirculation cooling units are provided for the following rooms where high heat load equipment is located:

- Rooms in the SB, divisions one through four, where safety injection and residual heat removal system components are installed.
- Valve rooms in the SB, divisions one through four, where component cooling water system and emergency feedwater system components are installed.
- Rooms where hydrogen and containment atmosphere monitoring system (divisions one and four), and severe accident sampling system (division four) components are installed.

Electric air heating convectors are provided in the service corridors, interconnecting passageway, and stairways to maintain the minimum allowable temperatures in these areas.

The SBVS is designed to circulate sufficient air to prevent accumulation of flammable or explosive gas or fuel-vapor mixture from components such as storage batteries and stored fuel.

Refer to Section 12.3.6.5.6 for ventilation system design features which demonstrate compliance with the requirements of 10 CFR 20.1406.

9.4.5.2.2 Component Description

The major components of the SBVS are listed below, along with the applicable code and standards. Table 3.2.2-1 provides the seismic design and other design classifications for components in the SBVS.

Ductwork and Accessories

The main supply and exhaust air shafts are constructed of concrete with painted surfaces. The air supply and exhaust duct branches for each area are fed from the main supply and exhaust air shafts. These ducts are constructed of steel and structurally designed for fan shutoff pressures. The ductwork meets the design, testing and construction requirements per ASME AG-1 (Reference 2).

Electric Air Heating Convectors (Area Heaters)

The electrical air heating convectors are installed to maintain room ambient conditions. The convectors are controlled by local room temperature sensors and control circuits.

Moisture Separator

The moisture separator is a combination of moisture separator and prefilter. The moisture separator must meet the requirements of RG 1.52 (Reference 10), ASME N509 (Reference 9), and ASME AG-1 (Reference 2). The moisture separator is located upstream of the filter air heater and the HEPA prefilter. The moisture separator shall be a design that has been qualified by testing in accordance with the procedures described in Reference 9.

Filter Air Heaters

~~Filter air~~Two stage electric heaters are located upstream of HEPA and iodine filtration units to prevent excessive moisture accumulation in the charcoal filter beds. At the start of an accident, full power of two stage electric heater is switched on when the fans start and filter bank isolation dampers open. As the negative pressure is drawn in the FB and SB, and when the temperature downstream of heater increases to 158°F, one step of heater power is switched off automatically. As the temperature downstream of heater reaches 176°F, second step of the heater is also switched off automatically. The heaters meet the requirements of Reference 2.

- Recirculation cooling units in the SB divisions one and four, where the EFW valves are located.

Loss of Ultimate Heat Sink

During loss of ultimate heat sink (LUHS), the air flow of the recirculation cooling units is cooled by the chilled water provided by the SCWS. Two water-cooled chillers are located in divisions two and three, and two air-cooled chillers are located in divisions one and four. In case of LUHS, the water-cooled chillers are not available. With the safety chilled water divisions 1/2 and 3/4 interconnect, the safety chilled water is then supplied by air-cooled chillers which provide the cooling function for the recirculation cooling units located in divisions one, two, three and four.

Loss of Coolant Accident

~~In the event of a loss of coolant accident (LOCA), a containment isolation signal initiates isolation of the SB controlled areas from the supply to the SBVSE and the exhaust from the NABVS. Air is supplied from the SB controlled areas and exhausted through the SBVS iodine exhaust filtration trains (located in the FB) and discharged to the plant vent stack. To support the operation of plant equipment, recirculation cooling units maintain rooms in the SB controlled areas at ambient conditions.~~

Upon receipt of a containment isolation signal, the following functions are initiated automatically:

- Closes SBVS supply air isolation dampers from SBVSE.
- Closes SBVS exhaust air isolation dampers to NABVS.
- Opens SBVS exhaust air isolation dampers to exhaust air from the hot mechanical areas of SB to the SBVS Accident Exhaust Iodine Filtration Trains (located in the FB).
- Opens isolation dampers for the SBVS Accident Exhaust Iodine Filtration Trains.
- Starts SBVS iodine filtration train fans to pull air through SBVS Accident Exhaust Iodine Filtration Trains and to direct exhaust air to the vent stack.

In the event of a LOCA, the containment isolation signal initiates isolation of the FB from NABVS supply and exhaust duct to limit leakage into the FB. The SBVS maintains a negative pressure in the FB and exhaust air from the FB is directed to the SBVS iodine filtration trains (refer to Section 9.4.2).

Iodine Presence in the SB Rooms

In the event of a failed fuel element and residual heat removal pump seal leakage, high iodine is expected to be present in only one of the four divisions at a time, and it is

All indicated changes are in response to RAI 505, Question 07.01-35

- The cooling supply units are designed to provide cooling as required to prevent the SBVSE room temperatures from exceeding their maximum design temperature.

- Winter heating loads will be calculated with the plant operating in an outage alignment configuration. Winter heat loads will be calculated with a minimum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1).

- The SBVSE supply air duct heaters are designed to operate as required when the supply air temperature is less than the minimum set point value.

With outside air ambient design temperature conditions of -40°F to 115°F, the SBVSE maintains the following temperature and humidity ranges for the areas serviced.

Room	Temperature	Humidity
Rest Rooms, changing rooms	65°F - 78°F	~~3~~10 - 60%
RSS	65°F - 78°F	~~3~~10 - 60%
Switchgear Rooms	59°F - 104°F	~~3~~10 - 60%
Cable Floor	41°F - 95°F	~~3~~10 - 60%
I&C Equipment Room	68°F - 82°F	~~3~~10 - 60%
Battery Rooms	65°F - 77°F	~~3~~10 - 60%
HVAC Rooms	50°F - 95°F	~~2~~10 - 80%
Cold Mechanical Areas, Emergency Feedwater Pump Rooms, and Component Cooling Water Pump Rooms	41°F - 104°F	~~3~~10 - 60%
Corridors	50°F - 104°F	~~3~~10 - 60%

The SBVSE performs the following safety-related system functions:

- Maintains acceptable ambient conditions for the safety-related components in the electrical and instrumentation and controls (I&C) rooms in the SB during accident conditions, taking into account internal and external heat loads.

- Maintains acceptable ambient conditions inside the emergency feed water system (EFWS) pumps and component cooling water system (CCWS) component rooms of the SB during accident conditions, taking into account internal and external heat loads.

Additional electric heaters installed in supply air ducts are used to maintain the minimum temperatures in battery rooms and toilet rooms.

For each division, the SBVSE consists of:

- A single air intake equipped with a damper and grilles. The SBVSE air intakes in divisions 2 and 3 are common for the main control room (MCR) air conditioning system (CRACS) (refer to Section 9.4.1) and SCS of the same division (refer to Section 9.4.13).

- A safety-related air conditioning train. Mixing is done with control dampers, filtration with filters, heating with electric air heater, and cooling with air cooling coil, ~~ventilation with supply air fan, and humidification with non-safety-related air humidifiers~~. The train also has the associated exhaust air train, with exhaust fan and control damper.

- A connection with a non-safety-related air conditioning train. Mixing is done with control dampers, filtration with filters, heating with electric air heater, cooling with air cooling coil, and ventilation with supply air fan~~, and humidification with air humidifiers~~. The train also has the associated exhaust air train, with exhaust fan and control damper.

- Cross-connected ducts between divisions 1 and 2 and divisions 4 and 3 for the HVAC supply and exhaust with the non-safety-related maintenance trains for use when one SBVSE safety-related train of division 2 or 3 is unavailable. Manual isolation dampers equipped with “opened” and “closed” limit switches are installed in the cross-connected ducts (i.e., supply and exhaust ducts of division 1 and 2 and division 3 and 4).

- Connections providing air to the mechanical controlled area (interface with SBVS).

- A single ductwork providing air to the electrical rooms and mechanical non-controlled rooms.

- Two independent exhaust ductworks:

  - The first exhaust ductwork is used for the rooms in the non-controlled area of the SB, except for rooms served by the second exhaust ductwork. It is connected to one of the two recirculation-exhaust fans. One of the fans is a safety-related fan and is located in the same division. The other is a non-safety-related fan for maintenance operation, which is common for the two combined divisions 1 and 2 (located in division 1) and the two combined divisions 3 and 4 (located in division 4). The exhaust air of transformers and inverters is directly exhausted through exhaust hoods above the equipment.

  - The second exhaust ductwork is used for the rooms which could accumulate specific gas (hydrogen in the battery rooms and refrigerant gas in the rooms of the SCWS) and for the non-controlled mechanical area. The air is directly exhausted outside using one of two exhaust fans (one safety-related fan, or one

- Air cooling coil of finned tube coil type has a total cooling capacity of 1,134,900 Btu/hr, supplied with chilled water by the SCWS of the same division.
- Droplet separator, connected to the nuclear island drain and vent system (NIDVS).
- Silencer on fan suction side, splitter type.
- Supply air fan, free wheel radial type, direct driven, with a design air flow of 29,500 scfm.
- Non-return damper.
- Silencer on fan discharge side, splitter type.
- ~~Two air humidifiers, electrically heated and connected to the potable and sanitary water system (PSWS), and NIDVS.~~

Recirculation-Exhaust Air – Safety-Related Train

The recirculation and exhaust air trains are located in divisions 1 and 4 at elevation +39 ft and in divisions 2 and 3 at elevation +69 ft.

Each train includes:

- Isolation dampers, manually operated.
- Recirculation and exhaust air fan, radial type, direct driven, with a design air flow of 29,500 scfm.
- Control damper with electrical actuator.
- Non-return damper.
- Isolation damper, manually operated.
- Dampers.
- Weather protection grilles.

Exhaust Air for Battery-Safety Chilled Water Room and Non-controlled Mechanical Area – Safety-Related Train

The exhaust air trains are located in divisions 1 and 4 at elevation +39 ft and in divisions 2 and 3 at elevation +69 ft.

Each train includes:

- Isolation damper, manually operated.
- Exhaust air fan, radial type, direct driven.

- Non-return damper.
- Isolation damper with electrical actuator.

Supply Air System – Maintenance Train

The maintenance train is non-safety-related. The supply air units are located in divisions 1 and 4 at elevation +39 ft. The components are installed in a sheet metal structure.

Each air conditioning train includes:

- Insect protection screen.
- Isolation damper, manually operated.
- Set of control dampers with electrical actuator.
- Prefilter.
- Roughing filter.
- Electric heater, with tubular elements, comprised of four heating stages.
- Air cooling coil of finned tube coil type, has a total cooling capacity of 1,134,900 Btu/hr supplied with chilled water by the operational chilled water system (OCWS).
- Droplet separator, connected to the NIDVS.
- Silencer on fan suction side, splitter type.
- Supply air fan, free wheel radial type, direct driven, with a design air flow of 29,500 scfm.
- Non-return damper.
- Silencer on fan discharge side, splitter type.
- ~~Two air humidifiers, electrically heated and connected to the PSWS and the NIDVS.~~

Recirculation-Exhaust Air – Maintenance Train

The maintenance train is non-safety related. The recirculation-exhaust air trains are located in divisions 1 and 4 at elevation +39 ft.

Each train includes:

- Isolation dampers, manually operated.

Exhaust Air – Non-Safety Related

One exhaust fan is assigned to the toilet rooms located in divisions 1 and 4 at elevation + 55 ft. The fans are located at elevation +81 ft with the following components:

- Exhaust fan, axial type, direct driven.
- Non-return damper.
- Isolation damper, manually operated.

9.4.6.2.3 System Operation

Normal Plant Operation

The SBVSE operates during normal plant operation and during outage conditions. The HVAC for each division (1 to 4) is provided by an air supply train and associated exhaust train (with the same safety classification). The normal operation for each division follows:

- The safety-related train is in service to provide filtration, heating, and cooling ~~and humidification~~. Outside makeup air is supplied to each train of the SBVSE through a separate air intake. This outside air mixes with the recirculated air upstream of the supply air filters. The amount of outside air admitted depends on the outside air temperature and is automatically adjusted by control dampers. If required, air heating is performed by the electric air heater. Air cooling is performed by the air cooling coil. The supply air fan supplies the air to the rooms of the SB division. ~~If required, humidification is performed by the air humidifiers.~~
- The maintenance train (non-safety-related) for supply air and exhaust air is shut down.
- Air is supplied to the non-contaminable rooms of the SB plus the hot (controlled) mechanical area, which is exhausted by the SBVS.
- Air is exhausted from all rooms, except the controlled area exhausted by the SBVS.
- Air is released from the rooms representing the risk of accumulation of specific gas (i.e., hydrogen in battery rooms and refrigerant gas in SCWS room) and the rooms of the cold (i.e., non-controlled) mechanical area to the outside by a dedicated exhaust fan.
- Exhaust air is released from the toilet rooms of division 1 and 4 to the outside, also by a dedicated exhaust fan.
- The exhaust air of the remaining rooms is collected and directed to the recirculation-exhaust fan where a portion of the air can be recirculated or directly discharged to the outside. The amount of air to be recirculated depends on the outside air temperature and is automatically adjusted by the control damper.

Each SBVSE train is located in a separate enclosure and is independently powered to limit common mode active failures of multiple trains. Common mode failures of the SBVSE are minimized due to the diversity of fans of the safety-related trains (i.e., divisions 1 and 4 as opposed to divisions 2 and 3) and because of the diversity of the cooling and the heat sinks for the associated SCWS.

Failure of a SBVSE component will not adversely affect the operation of the interfacing systems SCWS~~,~~ or OCWS.~~, or PSWS.~~

If the SBVSE in one division fails, switchover from the safety-related train to the maintenance train of either division 1 or 2 or division 3 or 4 is possible. Therefore, ventilation of electrical and I&C equipment in all divisions is provided even in case of failure of one of the four divisions.

Additionally, the SCWS has the same configuration as the SBVSE. If the SCWS in one division fails, switchover from the safety-related train to the maintenance train in either division 1 and 2 or division 3 and 4 is possible.

If a failure of a safety-related train of the SB is postulated during maintenance of an SB HVAC train, two SB trains remain available.

Loss of Offsite Power (LOOP)

In case of LOOP, fans and actuators of each safety-related train of the SBVSE (division 1 to division 4) are backed up by the corresponding emergency diesel generator.~~, with the exception of the humidifiers. Humidifiers are not required for safety function.~~

Loss of Ultimate Heat Sink (LUHS)

For the SBVSE, the chilled water to the safety trains is provided by the SCWS, with the following key features:

- Two water-cooled chillers, cooled by the CCWS, in divisions 2 and 3.
- Two air-cooled chillers at elevation +39 ft in divisions 1 and 4.

In case of loss of ultimate heat sink (LUHS), the SCWS air-cooled chillers will continue to provide the cooling function of the SBVSE of the two divisions 1, 2, 3, and 4.

9.4.6.3 Safety Evaluation

The safety-related portion of the SBVSE is located in the associated SB. The SB is a Seismic Category I structure that is designed to withstand the effects of earthquakes, tornadoes, hurricanes, floods, external missiles, and other appropriate natural phenomena. Sections 3.3, 3.4, 3.5, 3.7, and 3.8 provide the bases for the adequacy of the structural design of this building.

9.4.9 Emergency Power Generating Building Ventilation System

The emergency power generating building ventilation system (EPGBVS) maintains acceptable ambient conditions and air renewals of the diesel hall, electrical room, and main tank room of each of the four divisions of the Emergency Power Generating Buildings (EPGB). Each division has its own independent heating, ventilation and air conditioning (HVAC) system which is not connected to other divisions. Two divisions are located in each of the two EPGBs.

9.4.9.1 Design Bases

~~The EPGBVS is safety related and designed to meet Seismic Category I requirements.~~ The EPGBVS consists of safety-related and non-safety-related air supply and exhaust systems. The safety-related portion is designed to Seismic Category I requirements, and the non-safety-related portion is designed to Seismic Category II requirements. The EPGBVS performs the following safety-related system function and complies with the general design criteria (GDC) indicated below:

- The EPGBVS maintains acceptable temperatures and air renewals in each of the four divisions to support the operation of the emergency diesel generators (EDG) and electrical control panels. The EDGs are required to provide onsite emergency power for the safety-related equipment to achieve and maintain the plant in a safe shutdown condition following a design basis accident, including loss of offsite power (LOOP).

- In accordance with GDC 2, the EPGBVS components are located inside the EPGBs, which are designed to withstand the effects of natural phenomena, such as earthquakes, tornados, hurricanes, floods and external missiles.

- In accordance with GDC 4, the EPGBVS components remain functional and continue to perform their intended safety function after anticipated operational occurrences and design basis accidents, such as fire, internal missiles, or pipe breaks.

- In accordance with GDC 5, the safety-related components and systems of the EPGBVS are not shared with other nuclear power units.

- In accordance with GDC 17, the U.S. EPR contains an onsite and offsite electric power system that supports the functioning of structures, systems, and components important to safety in the event of postulated accidents and anticipated operational occurrences. The EPGBVS maintains a minimum clearance of 20 feet from the bottom of fresh air intakes to grade elevation, and electrical cabinets are provided with suitable seals or gaskets. These features maintain proper functioning of the essential electric power system by meeting the guidelines of NUREG-CR/0660 (Reference 1), as related to the accumulation of dust and particulate material.

The essential onsite electrical power systems meet the guidance of NUREG-CR/0660 for protection of essential electrical components (such as contactors, relays, circuit breakers) from failure due to the accumulation of dust and particulate materials. This is accomplished by the use of filters and supply air units in the EPGBVS.

Air conditioning and heating loads for the EDG rooms are calculated using methodology identified in ASHRAE Handbook (Reference 8).

- Summer cooling loads will be calculated with a maximum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1). The analysis will be completed for both a normal and accident plant alignment configuration with EDG in operation.
- The cooling supply units are designed to provide outside air for cooling as required to prevent the EDG room temperatures from exceeding their maximum design temperature.
- Winter heating loads will be calculated with the plant operating in an outage alignment configuration, without diesel operation. Winter heat loads will be calculated with a minimum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1).

Though the EDGs are in standby mode during normal plant operation, the EPGBVS is available in any plant operating condition. With outside air ambient design temperature conditions of -40°F to 115°F, the EPGBVS is designed to meet the following safety-related functional criteria:

- Maintains the diesel hall temperature between 59°F and 140°F.
- Maintains the electrical room temperature between ~~59~~40°F and ~~95~~113°F with 35 to 70 percent relative humidity.
- Maintains the main tank room temperature between 59°F and 120°F.

The EPGBVS performs the following non-safety system functions:

- Provide outside air and cooling to the diesel hall when the EDGs are not in operation, or safety-related supply and exhaust fans are not required to operate.
- Provide outside air and cooling to the electrical room.

9.4.9.2 System Description

9.4.9.2.1 General Description

The EPGBVS ventilates the diesel generators using outside air as the cooling medium. Air is supplied into the building to slightly pressurize the building, and is then vented from the building through exhaust air louver openings.

The EPGBVS includes ventilation of diesel divisions 1 through 4. Divisions 1 and 2 are located inside the EPGB located on one side of the Reactor Building (RB), and divisions 3 and 4 are located inside the EPGB located on the opposite side of the RB. Each division has a separate and independent HVAC system. The HVAC systems for each of the four divisions are identical.

The air intake and exhaust stack of the EPGBVS are located such that exhaust gases being drawn into the air inlet stream are limited to an insignificant level. The exhaust stack is located approximately 70 feet from the air intake, and the exhaust air flow is directed away from the air intake flow.

One of the divisions of the EPGBVS is illustrated in Figure 9.4.9-1—Emergency Power Generating Building Ventilation System. The other three divisions are identical.

The EPGBVS consists of following subsystems for each division:

- Ventilation of diesel hall.
- Ventilation of electric room.
- Ventilation of main tank room.

Ventilation of Diesel Hall

The outside air is drawn into the HVAC supply room through an air intake screen or grill which prevents large objects from entering the air intake. The fresh air intake is located approximately fifty feet above grade elevation and is protected against tornado missiles. The screen or grill is heated during the winter to prevent ice buildup.

The air from the HVAC supply room is supplied through two separate air trains which include back draft damper, prefilter, and supply fan. ~~Each Diesel Hall supply fan air flow is designed for 85,000 scfm. The supply air is then delivered through ductwork to the diesel hall. The main tank room supply air is supplied from the diesel hall or HVAC supply air room~~. Each diesel hall supply and exhaust fans maintain the diesel hall temperature between 59°F and 140°F. The supply air is delivered through ductwork to the diesel hall.

An additional non-safety-related air supply and exhaust ventilation system to the diesel hall is also installed that operates when the large safety-related supply and exhaust system is not required to operate during maintenance or when the moderate outside temperature does not allow the large supply and exhaust fans to operate. The non-safety-related air supply is drawn from the HVAC supply room, the system includes an air intake screen or grill, backdraft damper, prefilter, supply fan, motor operated damper, and manual damper. The non-safety-related air exhausts to the HVAC air exhaust room, the system includes a motor operated damper, exhaust fan and backdraft damper.

The non-safety-related ventilation system prevents frequent starting and stopping of the large safety-related supply and exhaust fans. A safety-related temperature sensor in the diesel hall controls operation of one or both safety-related supply/exhaust fans as required to maintain design temperature in the diesel hall. Initially, the non-safety fans operate, and as the diesel hall temperature increases both safety-related supply/exhaust fans start operating. Operation of safety-related fans shuts down the non-safety fans and closes the motor operated dampers. A separate safety-related temperature sensor in the diesel hall provides low/high room temperature alarm in the MCR. This sensor also closes the safety-related motor operated dampers located on the non-safety-related air supply/exhaust system when the diesel hall temperature reaches at or below 59°F.

During winter conditions, when the EDGs are not in operation, the air in the diesel hall is recirculated through four electrical air fan heaters. These fans are controlled by local thermostats to maintain the required minimum temperature.

The exhaust air from the diesel hall is directed to the HVAC exhaust room through two separate ducts which include an exhaust fan and a back draft damper. The exhaust plenum is split into two sections: one is for the diesel engine exhaust, and the other is for HVAC exhaust. This separation of exhaust prevents diesel exhaust back pressure from affecting the HVAC exhaust ventilation fans. This boundary prevents inadvertent entry of diesel engine exhaust into the diesel room if one of the HVAC exhaust damper fails to close. This partition also protects the HVAC equipment and improves working environment inside the area. ~~Each Diesel Hall supply fan air flow is designed for 85,000 scfm. The exhaust air is then directed to the building exhaust through an outlet screen or grill.~~

Ventilation of Electric Room

A non-safety-related inlet air supply for the electrical room is drawn from outside air through a motor operated damper, manual damper, prefilter, refrigerant evaporator cooler, and fan. The operation of this unit is automatically controlled by a room thermostat that maintains the electrical room temperature between 40°F and 113°F. A safety-related temperature sensor located outside under a tornado protective hood, sends a signal to open or close the safety-related motor operated damper that is located on the non-safety-related inlet air supply. This damper automatically closes when outside air temperature is below 50°F or above 100°F. This prevents entry of hot or cold outside air. The non-safety-related cooling system operates only when the EDGs are not operating. A backdraft damper is installed at the boundary of electrical room and diesel hall to allow the electrical room air to exhaust to the diesel hall.

A safety-related cooling system for the electrical room operates when the EDGs are also operating. This system recirculates the electrical room air through an air conditioning unit that consists of fire dampers, manual damper, prefilter, HEPA filter,

cooling coil, moisture separator, and supply fan. The fan air flow maintains electrical room temperature within the design temperature limits of 40°F and 113°F. The water for the cooling coil is supplied from the ESW system. The recirculated air from the electrical room is controlled to maintain ambient conditions inside the electrical room.

~~The inlet air supply for the electric room is drawn from HVAC supply air room through an electric louver damper. The supply air is then directed through an air conditioning unit which consists of a manual louver damper, prefilter, high efficiency particulate air (HEPA) filter, cooling coil, moisture separator, electric heater, supply fan, and a humidifier. The control/electrical room supply fan air flow is designed for 6,000 scfm. The cooling coil has a total cooling capacity of 140,000 Btu/hr and is cooled by a packaged chiller unit. The conditioned air is supplied to the electric room through a back draft damper and a fire damper. The electric heater increases the supply air temperature during winter conditions.~~

~~The exhaust air from the electric room is recirculated back to the air conditioning unit through a fire damper and a back draft damper. The outside air supply and recirculated air from the electric room are controlled to maintain ambient conditions inside the electric room.~~

Ventilation of Main Tank Room

The air supply to the main tank room is drawn from the diesel hall or HVAC supply air room through an electric louver damper, a back draft damper, and a fire damper. The exhaust air from the main tank room is directed through louver damper, exhaust fan, and a back draft damper. The exhaust air is then directed to the building exhaust through an outlet screen or grill. The exhaust fan is designed to maintain the required ventilation rate of the main tank room. The main tank room exhaust design air flow is 3,200 scfm. During winter, local heaters maintain the required minimum temperature inside the main tank room. These heaters are controlled by local thermostats.

9.4.9.2.2 Component Description

The major components of the EPGBVS are listed in the following paragraphs, along with the applicable codes and standards. Table 3.2.2-1 provides the seismic design and other design classifications for components in the EPGBVS.

Ductwork and Accessories

The supply and exhaust air ducts are constructed of galvanized or stainless steel plates or sheets, and structurally designed for fan shutoff pressures. The ductwork meets the design, testing and construction requirements of ASME AG-1 (Reference 1).

Electric Air Heating Convectors (Area Heaters)

The electric area heaters are installed in the main tank room to maintain room ambient conditions and controlled by local room temperature sensors. Electrical heating coils are fin tubular type and meet the requirements of Reference 1.

~~In-line Electric Air Heaters~~

~~In-line electric air heaters are installed in the air conditioning ductwork for the electric room and used to heat the supply air to the acceptable temperature. The heaters will meet the requirements of Reference 1.~~

Fan Heaters

Fan heaters are used in the diesel hall to maintain acceptable temperature in the area. The fan heaters include a fan and electric heater. These fan heaters are controlled by a thermostat.

Prefilters

~~The~~ Prefilters are located upstream of HEPA filters and on all supply air inlets. ~~collect large particles to increase the useful life of high efficiency filters.~~ The prefilters meet the requirements of ANSI/ASHRAE Standard 52.2 (Reference 2).

HEPA Filters

HEPA filters are constructed, qualified and tested in accordance with Reference 1. The periodic inplace testing of HEPA filters to determine the leak-tightness is performed in accordance with ASME N510 (Reference 3).

Fans

The supply and exhaust fans are centrifugal or axial type with electrical motor drivers. Fan performance is rated in accordance with ANSI/AMCA 210-99 (Reference 4), ANSI/AMCA-211-1987 (Reference 5), and ANSI/AMCA 300-1985 (Reference 6).

Isolation Dampers

Manual dampers are adjusted during initial plant testing to establish accurate flow balance between the rooms. The motor-operated dampers will fail in the “as-is” position in the case of power loss. The performance and testing requirements of the dampers are in accordance with Reference 1.

Fire Dampers

Fire dampers are installed where ductwork penetrates a fire barrier. Fire damper design meets the requirements of UL 555 (Reference 7) and the damper fire rating is

commensurate with the fire rating of the barrier penetrated. The fire dampers are included in the discussion of the EPGB fire protection system (refer to Appendix 9A.3.6).

Cooling Coils

Cooling coils are installed in the supply and recirculation train for cooling of the electrical room. The cooling coils are of finned tube coil type and designed in accordance with Reference 1. The coil in the non-safety air cooling system is cooled using a refrigerant evaporator cooler. The safety recirculation cooling coil is cooled by the ESW system. ~~The coil is cooled using a refrigerant from a packaged chiller unit.~~

~~Humidifiers~~

~~A humidifier is installed in the air conditioning train to maintain humidity conditions as required in the electric room. Humidity levels are controlled by the humidity sensors in the room.~~

Moisture Separator

The moisture separator is installed in the air conditioning train to collect condensate, which is directed to the drain system.

9.4.9.2.3 System Operation

Normal Plant Operation

The EPGBVS maintains acceptable ambient conditions in the diesel hall, electric room, and main tank room of each of the four EPGB divisions. During normal plant operation, the EDGs do not operate. However, outside air is supplied to the diesel hall to maintain an acceptable ambient temperature for the startup of the EDGs and personnel comfort. In winter conditions, four fan heaters are available to maintain the required minimum temperature in the diesel hall. When the EDGs are in operation, the exhaust air removes the heat generated in the diesel hall. The operation of air supply fans and the opening of dampers depend on the diesel hall temperature detected by the sensors. The diesel hall temperature is kept in the appropriate band by controlling the position of dampers and operating the air supply fans.

Air renewals for the ~~electrical room,~~ diesel hall~~,~~ and main tank room are maintained as needed to obtain the required ambient temperatures. The non-safety-related split system air conditioner supplies the electrical room with outside air that is mixed with the recycled air from the electrical room. The mixed air is then processed through the air conditioning train and supplied to the electrical room. The safety-related ESW cooling unit will operate only when the EDGs are operating or during the tests of EDGs. ~~The electrical room is supplied with outside air and mixed with recycled air from the electrical room. The mixed air is then processed through the air conditioning~~

~~train and supplied to the electrical room. The mixed air supply temperature and humidity is adjusted by an electrical heater, cooling coils, and humidifier located in the air conditioning train for the electric room.~~

The main tank room is ventilated by air supplied from the HVAC supply air room or diesel hall. The main tank room air is discharged through the exhaust duct to an exhaust fan and then out of the building. The main tank room is heated by a local electric heater, which is activated by a thermostat to maintain a minimum required room temperature.

Fire dampers are located on the ventilation system to avoid fire propagation in the building. The rooms are completely isolated in case of a fire in the room. Fire is detected by a fire alarm system which automatically closes the corresponding fire damper.

Abnormal System Operating Conditions

Failure of Diesel Hall Air Supply

If one or more components of the diesel hall supply air fail, the EPGBVS is not able to maintain the required ambient conditions. At lower outside temperature, the system uses only one supply fan to provide sufficient ventilation for the proper operation of the EDGs. Since there are four redundant EPGB divisions, the failure of the diesel hall air supply in one division does not affect the other three divisions.

Failure of Diesel Hall Fan Heater

The diesel hall has four fan heaters. In the case of failure of one heater fan, the other three fans are able to maintain the required temperature in the diesel hall.

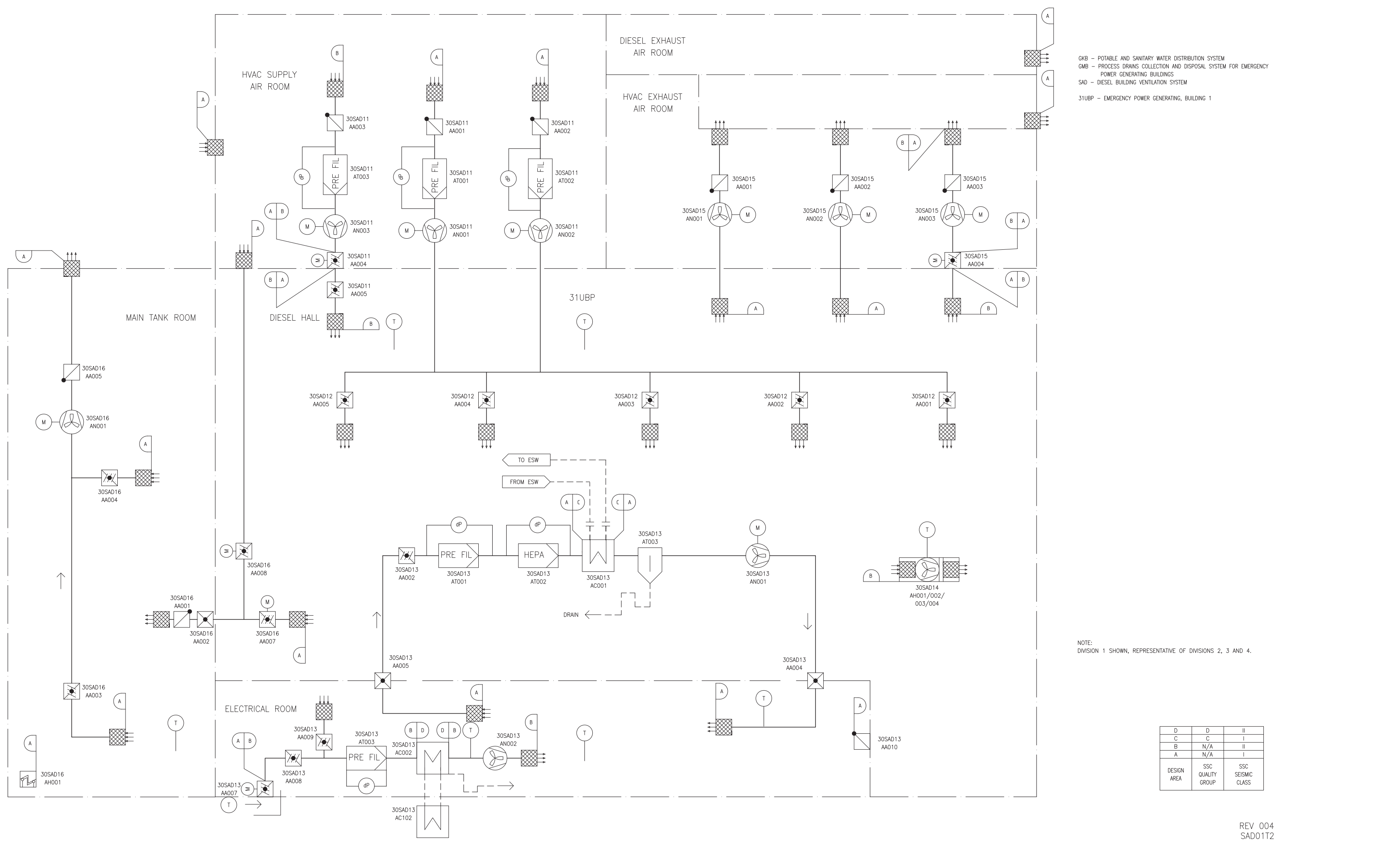
Failure of Electric Room Safety-Related Air Cooling Unit ~~Air Supply~~

In the case of failure of a component on the safety-related air conditioning train for the electric room, the required ambient conditions are not maintained in the electric room when EDG is operating. However, other unaffected divisions are available to provide necessary power during this event.

Failure of Exhaust Components

In the case of failure of any of the EPGBVS exhaust components, proper ambient conditions are not maintained. However, other unaffected divisions are available to provide necessary power during this event.

Figure 9.4.9-1—Emergency Power Generating Building Ventilation System



9.4.11 Essential Service Water Pump Building Ventilation System

The essential service water pump building ventilation system (ESWPBVS) provides conditioned air to the essential service water system (ESWS) pump areas and associated electrical equipment areas. The ESWPBVS provides an environment suitable for the operation of the ESWS pumps (refer to Section 9.2.1) and associated electrical equipment by maintaining acceptable temperature conditions in each of the four ESWS Pump Buildings. Each building has its own independent ventilation system and is not connected to the other buildings.

9.4.11.1 Design Bases

The ESWPBVS consists of a safety-related cooling system and room air heaters and a non-safety related cooling unit. The safety-related portion is designed to Seismic Category I criteria. The non-safety-related portion is designed to Seismic Category II. ~~All components of the ESWPBVS are safety related and designed to Seismic Category I requirements.~~ The ESWPBVS performs the following safety-related system functions and complies with the general design criteria (GDC) indicated below:

- The ESWPBVS maintains acceptable temperature limits to support operation of the ESWS pumps that are required to operate during design basis accident conditions. The ESWPBVS maintains a minimum temperature of 41°F and a maximum temperature of ~~104~~113°F in the ESWS Pump Buildings for personnel accessibility and to support operation of the ESWS pumps. This temperature range maintains a mild environment in these buildings, as defined in Section 3.11.

- The ESWPBVS components are located inside the ESWS Pump Buildings, which are designed to withstand the effects of natural phenomena, such as earthquakes, tornadoes, hurricanes, floods, and external missiles (GDC 2).

- The ESWPBVS components are appropriately protected against dynamic effects and designed to accommodate the effects of, and to be compatible with, the environmental conditions associated with normal operation, maintenance, testing and postulated accidents. The components of the ESWPBVS remain functional and perform their intended safety function after anticipated operational occurrences and design basis accidents, such as a fire, internal missiles, or pipe break (GDC 4).

- The safety-related components and systems of the ESWPBVS are not shared among nuclear power units (GDC 5).

- The essential onsite electrical power systems meet the guidance of NUREG-CR/0660 (Reference 1) (subsection A–item 2, and subsection C-item 1) for protection of essential electrical components (such as contactors, relays, circuit breakers) from failure due to the accumulation of dust and particulate materials (GDC 17).

- Power and control functions are designed in accordance with RG 1.32.

Air conditioning and heating loads for the ESWS pump rooms are calculated using methodology identified in ASHRAE Handbook (Reference 8).

- Summer air conditioning loads will be calculated with a maximum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1). The analysis will be completed for both a normal and accident plant alignment configuration.
- The safety-related cooling supply units are designed to provide cooling as required to prevent the ESWS pump room temperatures from exceeding their maximum design temperature.
- Winter heating loads will be calculated with the plant operating in an outage alignment configuration. Winter heat loads will be calculated with a minimum outside air design temperature 0 percent exceedance value, using U.S. EPR Site Design Envelope Temperature (See Table 2.1-1).

The ESWPBVS performs the following non safety-related system functions:.

- Provides outside air and cooling to the ESWPB when the ESW pumps are not operating.

9.4.11.2 System Description

9.4.11.2.1 General Description

A drawing of the ESWPBVS applicable to each of the four ESWS Pump Buildings is shown in Figure 9.4.11-1—Essential Service Water Pump Building Ventilation System.

The ESWPBVS supplies the recirculation air for cooling or heating of the ESWS pump area and electrical equipment area located inside each of the four ESWS Pump Buildings. Each building has its own independent ventilation system.

This ventilation system is not expected to contain or interface with any radioactive materials, and so is not considered an Engineered-Safety-Feature Atmospheric Clean-Up System.

Safety-Related Cooling and Heating

The safety-related cooling units operate when the ESW pump is operating in that building. Room air is drawn through an air inlet grill and processed through an air conditioning train. The conditioned air is supplied to the ESWS pump area and electrical equipment area. The room air is then returned to the air conditioning train. The air conditioning train for each building is comprised of the following components:

- Recirculation supply air ductwork.

- Manual balancing damper.
- Prefilter.

Each ESWPB has two safety-related room air heater units to prevent freezing within the ESW pump rooms during winter.

- Cooling coils, which cool the recirculation air to the required supply air temperature, have a total cooling capacity of 619,400 Btu/hr. The cooling coils are supplied with water from the ESWS pump and the water is discharged into the respective cooling tower basin. Manual isolation valves are provided to isolate the cooling coils for maintenance.
- Moisture separator, which drains the condensate to the cooling tower basin.
- Heaters, which heat the recirculation air during winter conditions to maintain the minimum required temperature.
- Supply air recirculation fans, are designed to provide an air flow rate of 30,000 scfm.
- Supply air louver dampers.~~, which control the air flow to the ESWS pumps area and electrical equipment area.~~
- Motor operated outside air inlet and outlet isolation dampers.

Non-Safety Related Cooling Unit

The non-safety-related cooling units in each pump house pull in outside air through a grille protected by a tornado barrier. The outside air is mixed with recirculated room air through balancing dampers and processed through an air conditioning train. The non-safety-related air conditioning train for each building is comprised of the following components:

- Supply ducting with bird screen.
- Manual balancing dampers.
- Prefilters.
- Split system refrigerant air conditioning cooling coil.
- Supply air fan.

9.4.11.2.2 Component Description

The major safety-related components of the ESWPBVS are listed in the following paragraphs, along with the applicable codes and standards. Table 3.2.2-1 provides the seismic design and other design classifications for components in the ESWPBVS.

Ductwork and Accessories

The supply air duct is constructed of galvanized sheet steel and is structurally designed for the fan shutoff pressure. The ductwork meets the design, construction and testing requirements of ASME AG-1 (Reference 2).

Cooling Coils

The cooling coils are designed in accordance with Reference 2.

Cooling Coil Isolation Valves

The cooling coil isolation valves are designed to meet ASME Boiler and Pressure Vessel Code, Section III, Class 3 (Reference 7).

Moisture Separators

Each moisture separator is installed to collect the condensate which is directed to the cooling tower basin.

~~Electric Heaters~~

~~The electric heaters meet the requirements of Reference 2.~~

Air Supply Fan

The fan is centrifugal or axial type with an electrical motor driver. Fan performance is rated in accordance with ANSI/AMCA-210 (Reference 4), ANSI/AMCA-211 (Reference 5), and ANSI/AMCA-300 (Reference 6).

~~Isolation~~Balancing Dampers

Manual dampers are adjusted during initial plant testing to establish an accurate flow balance. The performance and testing requirements of the dampers are per Reference 2.

Motor Operated Isolation Dampers

The motor operated isolation dampers will fail in position in case of power loss. The outside air inlet/outlet motor operated isolation dampers are designed to ASME AG-1 (Reference 2) damper isolation leakage class II requirements.

Electric Heaters

The electric heaters meet the requirements of Reference 2.

9.4.11.2.3 System Operation

Normal Plant Operation

During normal plant operation, the non-safety-related cooler maintains the ESW Pump Room between 50°F and 100°F, during summer months when the ESW pumps are not in operation. The safety-related cooler for a particular ESWPB will operate when the ESW pump in that building is in operation. The non-safety-related cooler can operate concurrent with the safety-related cooler with or without the ESW pumps in operation. A safety-related temperature sensor (located outside under the tornado protective hood for inlet outside air) sends a signal to open or close the safety-related inlet and outlet motor operated isolation dampers when the outside air temperature is above 100°F or below 50°F. This will prevent the entry of the hot or cold outside air, which could allow the temperature in the ESW building to fall above or below the maximum/minimum design temperature of 113°F/40°F.

During winter, the room air is heated by two safety-related wall mounted electric heaters. Local thermostats start and stop the safety-related heater units to maintain the ESW pump room temperature between 50°F and 100°F.

~~During normal plant operation, two ESWS pumps are in operation. The room air is recirculated through the air conditioning train, which supplies the required air flow at the required temperature. During winter, the recirculated air is heated by the electric heaters to maintain the required temperatures in the building. The heaters automatically start when the room temperature drops to 41°F, and shut off when it rises above 60°F.~~

~~The ESWPBVS also functions when the ESWS pumps are not in operation to maintain acceptable room temperatures for start of the ESWS pumps and personnel comfort. The room temperature is monitored by the temperature sensors for each building.~~

Abnormal Operating Conditions

If one or more components of the ESWPBVS fail, the ESWPBVS is not able to maintain the required ambient conditions in the affected building. Because there are four independent ESWS pump buildings, the failure in one building does not affect the other three buildings.

Loss of Off-Site Power

In the event of loss of offsite power (LOOP), the safety-related ESWPB~~VS~~ cooling system and room air heaters continue~~s~~ to operate. The power is supplied from the Class 1E emergency power supply system (EPSS).

Station Blackout

In the event of station blackout (SBO), the ESWPBVS is not operable.

Plant Accident Conditions

The safety-related ESWPB~~VS~~ cooling system and room air heaters ~~is~~ are required to operate during design basis accident conditions. Even if the ESWS pumps are not required to operate, the safety-related ESWPBVS maintains conditions in the ESWS pump buildings in case the ESWS pumps are required to operate.

9.4.11.3 Safety Evaluation

The ESWPBVS has sufficient cooling capacity to maintain the pump room temperature below ~~120~~113°F when the ESWS pump motors are operating at rated load and the outside air is at the maximum site design ambient temperature of 115°F. The heater is controlled by a local temperature control system having a predetermined temperature setpoint.

The ESWPBVS is located in the ESWS Pump Building, which is designed to withstand the effects of earthquakes, tornadoes, hurricanes, floods, external missiles, and other similar 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 components of the ESWPBVS remain functional and perform their intended safety function after anticipated operational occurrences and design basis accidents, such as a fire, internal missiles, or pipe break (GDC 4). Section 3.5.1.1 provides the bases for this determination for internally generated missiles outside containment. For missiles generated by tornadoes and extreme winds, see Section 3.5.1.4 and Section 3.5.2. Piping failures due to high energy line breaks are addressed in Section 3.6.1.

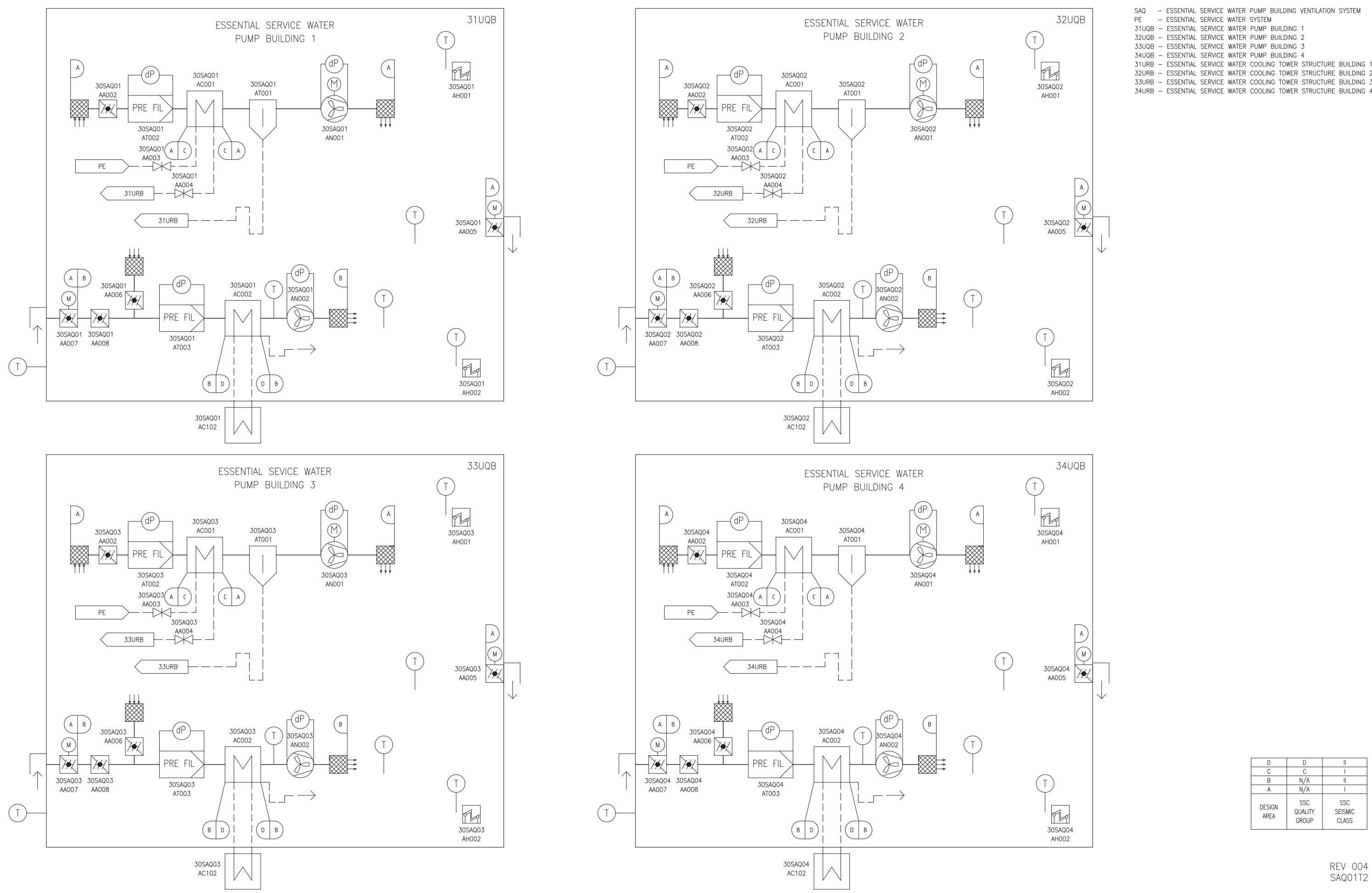
Since redundancy of the ESWPBVS is provided, no single failure compromises the safety functions of the system. Vital power is supplied from either onsite or offsite power systems, as described in Chapter 8.

The power supplies and control functions necessary for safe function of the ESWPBVS are from a Class 1E system, as described in Chapter 7 and Chapter 8.

9.4.11.4 Inspection and Testing Requirements

The ESWPBVS major components, such as dampers, motors, fans, filters, coils, heaters, and ducts are located to provide access for initial and periodic testing to verify their integrity.

Figure 9.4.11-1—Essential Service Water Pump Building Ventilation System



DESIGN AREA	SSC QUALITY GROUP	SSC SEISMIC CLASS
D	D	II
C	C	I
B	N/A	II
A	N/A	I

Next File

5.1.7 SBVS alarms, indicating lights and status lights meet design requirements.

5.1.8 SBVS meets duct/housing total leakage requirements.

5.2 Verify that safety-related components meet electrical independence and redundancy requirements.

5.3 The SBVS meets design requirements to monitor radiation (refer to Table 11.5-1, Monitors R-25 and R-26).

14.2.12.8.12 Emergency Power Generating Building Ventilation System (Test #084)

1.0 OBJECTIVE

1.1 To demonstrate proper operation of the emergency power generating building ventilation system (EPGBVS).

1.2 To demonstrate proper operation of the EPGBVS.

1.3 To demonstrate electrical independence and redundancy of power supplies.

2.0 PREREQUISITES

2.1 Construction activities on the EPGBVS have been completed.

2.2 EPGBVS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems required for operation of the EPGBVS are complete and functional.

2.4 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify design air flow with each EPGBVS in operation.

3.3 Verify design temperature can be maintained in each Emergency Power Generating Building.

3.4 Verify alarms, indicating instruments, and status lights are functional.

3.5 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

3.6 Verify that operation of dampers meet the requirements of ASME AG-1.

3.7 Verify that duct/housing leakage re

4.0 DATA REQUIRED

4.1 Fan and damper operating data.

4.2 Air flow verification

4.3 Setpoint at which alarms, interlocks, and controls occur.

4.4 Temperature data of each Emergency Power Generating Building.

5.0 ACCEPTANCE CRITERIA

5.1 The EPGBVS operates as designed (refer to Section 9.4.9):

5.1.1 EPGBVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

5.1.2 EPGBVS fan performance meets design requirements.

5.1.3 EPGBVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

5.1.4 EPGBVS air balance meets design requirements.

5.1.5 EPGBVS meets duct/housing total leakage requirements.

5.2 Verify that safety-related components meet electrical independence and redundancy requirements.

14.2.12.8.13 Smoke Confinement System (Test #085)

1.0 OBJECTIVE

1.1 To demonstrate the operation of the smoke confinement system (SCS) for Nuclear Island.

2.0 PREREQUISITES

2.1 Construction activities in the SCS are complete with penetrations sealed.

2.2 SCS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems required for operation of the SCS.

2.4 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify the operation of the supply air fans.

3.3 Verify operation of the smoke purge fans.

3.4 Verify alarms, indicating lights and status lights are functional.

3.5 Perform air flow balancing of the SCS.

3.6 Verify that operation of dampers meets design requirements.

14.2.12.8.16 Essential Service Water Pump Building Ventilation System (Test #088)

1.0 OBJECTIVE

1.1 To verify the essential service water pump building ventilation system (ESWPBVS) can maintain the space temperature as required.

1.2 To demonstrate electrical independence and redundancy of power supplies.

2.0 PREREQUISITES

2.1 Construction activities on the ESWPBVS have been completed.

2.2 ESWPBVS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems required for operation of the ESWPBVS are complete and functional.

2.4 Test Instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic and interlock.

3.2 Verify design air flow of each fan.

3.3 Verify alarms, indicating instruments and status lights are functional.

3.4 Verify design temperatures can be maintained in the structure.

3.5 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

3.6 Verify that operation of isolation dampers meet the requirements of ASME AG-1.

3.7 Verify operation of the electric air convectors (area heaters).

4.0 DATA REQUIRED

4.1 Temperature data for the structure from each fan unit.

4.2 Air balancing report, including fan operating data.

4.3 Setpoints at which alarms and interlocks occur.

5.0 ACCEPTANCE CRITERIA

5.1 The ESWPBVS operates as designed (refer to Section 9.4.11):

5.1.1 ESWPBVS alarms, interlocks, protective devices, and controls (manual and automatic) function as designed.

5.1.2 ESWPBVS fan performance meets design requirements.

5.1.3 ESWPBVS dampers/valve performance (i.e., thrust, opening times, closing times, and ability to control flow) meets design requirements.

5.1.4 ESWPBVS air balance meets design requirements.

5.1.5 ESWPBVS electric air heaters meet design requirements.

5.2 Verify that safety-related components meet electrical independence and redundancy requirements.

14.2.12.8.17 Main Steam and Feedwater Valve Room System (Test #089)

1.0 OBJECTIVE

1.1 To demonstrate that the main steam and feedwater valve room ventilation system (VRVS) provides a suitable operating environment for equipment and personnel during normal operations.

2.0 PREREQUISITES

2.1 Construction activities on the VRVS have been completed.

2.2 VRVS instrumentation has been calibrated and is operating satisfactorily prior to performing the following test.

2.3 Support systems required for operation of the VRVS are complete and functional.

2.4 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify design air flow with each VRVS in operation.

3.3 Verify design temperature can be maintained in each main steam and feedwater valve room.

3.4 Verify alarms, indicating instruments, and status lights are functional.

4.0 DATA REQUIRED

4.1 Fan and damper operating data.

4.2 Air flow verification.

4.3 Setpoint at which alarms, interlocks, and controls, occur.

4.4 Temperature data for each main steam and feedwater valve room train.

5.0 ACCEPTANCE CRITERIA

5.1 The VRVS operates as described in Section 9.4.12.