

ArevaEPRDCPEm Resource

From: BRYAN Martin (EXTERNAL AREVA) [Martin.Bryan.ext@areva.com]
Sent: Tuesday, September 14, 2010 5:33 PM
To: Tesfaye, Getachew
Cc: DELANO Karen (AREVA); ROMINE Judy (AREVA); BENNETT Kathy (AREVA); KOWALSKI David (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 345, FSAR Ch. 9, Supplement 6
Attachments: RAI 345 Supplement 6 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the 25 questions in RAI No. 345 on April 2, 2010. Supplement 1 response to RAI No. 345 was sent on June 4, 2010 to provide a revised schedule. Supplement 2 response to RAI No. 345 was sent on June 22, 2010 to address two of the questions. Supplement 3 response to RAI No. 345 was sent on July 8, 2010 to provide a revised schedule. Supplement 4 response to RAI No. 345 was sent on July 20, 2010 to provide technically correct and complete response to four questions and a technically correct and partial response to one question. Supplement 5 response to RAI No. 345 was sent on August 31, 2010 to provide a revised schedule.

The attached file, "RAI 345 Supplement 6 Response US EPR DC.pdf" provides technically correct and complete responses to six questions.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the responses to RAI 345 Questions 09.02.01-26, 09.02.01-31, 09.02.01-44, 09.02.01-45 and 09.02.01-47.

The following table indicates the respective pages in the response document, "RAI 345 Supplement 6 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

| Question # | Start Page | End Page |
|-----------------------|-------------------|-----------------|
| RAI 345 — 09.02.01-26 | 2 | 4 |
| RAI 345 — 09.02.01-31 | 5 | 5 |
| RAI 345 — 09.02.01-44 | 6 | 7 |
| RAI 345 — 09.02.01-45 | 8 | 9 |
| RAI 345 — 09.02.01-47 | 10 | 11 |
| RAI 345 — 09.02.01-50 | 12 | 12 |

The schedule for technically correct and complete responses to the remaining questions remains the same and is provided below.

| Question # | Response Date |
|------------------------------------|----------------------|
| RAI 345 — 09.02.01-28 | September 29, 2010 |
| RAI 345 — 09.02.01-29 | September 29, 2010 |
| RAI 345 — 09.02.01-32 | September 29, 2010 |
| RAI 345 — 09.02.01-34 (a, b and c) | September 29, 2010 |
| RAI 345 — 09.02.01-35 | September 29, 2010 |
| RAI 345 — 09.02.01-36 | September 29, 2010 |
| RAI 345 — 09.02.01-38 | September 29, 2010 |
| RAI 345 — 09.02.01-39 | September 29, 2010 |
| RAI 345 — 09.02.01-41 | September 29, 2010 |
| RAI 345 — 09.02.01-42 | September 29, 2010 |
| RAI 345 — 09.02.01-46 | September 29, 2010 |

| | |
|-----------------------|--------------------|
| RAI 345 — 09.02.01-48 | September 29, 2010 |
| RAI 345 — 09.02.01-49 | September 29, 2010 |

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
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From: BRYAN Martin (External RS/NB)
Sent: Tuesday, August 31, 2010 2:44 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); KOWALSKI David (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 345, FSAR Ch. 9, Supplement 5

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the 25 questions in RAI No. 345 on April 2, 2010. Supplement 1 response to RAI No. 345 was sent on June 4, 2010 to provide a revised schedule. Supplement 2 response to RAI No. 345 was sent on June 22, 2010 to address two of the questions. Supplement 3 response to RAI No. 345 was sent on July 8, 2010 to provide a revised schedule. Supplement 4 response to RAI No. 345 was sent on July 20, 2010 to provide technically correct and complete response to four questions and a technically correct and partial response to one question. Since responses to the remaining questions are being processed, a revised schedule is provided in this email.

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

| Question # | Response Date |
|------------------------------------|--------------------|
| RAI 345 — 09.02.01-26 | September 14, 2010 |
| RAI 345 — 09.02.01-28 | September 29, 2010 |
| RAI 345 — 09.02.01-29 | September 29, 2010 |
| RAI 345 — 09.02.01-31 | September 14, 2010 |
| RAI 345 — 09.02.01-32 | September 29, 2010 |
| RAI 345 — 09.02.01-34 (a, b and c) | September 29, 2010 |
| RAI 345 — 09.02.01-35 | September 29, 2010 |
| RAI 345 — 09.02.01-36 | September 29, 2010 |
| RAI 345 — 09.02.01-38 | September 29, 2010 |
| RAI 345 — 09.02.01-39 | September 29, 2010 |
| RAI 345 — 09.02.01-41 | September 29, 2010 |
| RAI 345 — 09.02.01-42 | September 29, 2010 |
| RAI 345 — 09.02.01-44 | September 14, 2010 |
| RAI 345 — 09.02.01-45 | September 14, 2010 |
| RAI 345 — 09.02.01-46 | September 29, 2010 |
| RAI 345 — 09.02.01-47 | September 14, 2010 |
| RAI 345 — 09.02.01-48 | September 14, 2010 |
| RAI 345 — 09.02.01-49 | September 29, 2010 |
| RAI 345 — 09.02.01-50 | September 14, 2010 |

Sincerely,

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From: BRYAN Martin (EXT)
Sent: Tuesday, July 20, 2010 5:24 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); KOWALSKI David J (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 345, FSAR Ch. 9, Supplement 4

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the 25 questions in RAI No. 345 on April 2, 2010. Supplement 1 response to RAI No. 345 was sent on June 4, 2010 to provide a revised schedule. Supplement 2 response to RAI No. 345 was sent on June 22, 2010 to address two of the questions. Supplement 3 response to RAI No. 345 was sent on July 8, 2010 to provide a revised schedule.

The attached file, "RAI 345 Supplement 4 Response US EPR DC.pdf" provides a technically correct and complete response to four questions and a technically correct and partial response to one question.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the responses to RAI 345 Questions 09.02.01-27, 09.02.01-30, 09.02.01-33, 09.02.01-34 and 09.02.01-43.

The following table indicates the respective pages in the response document, "RAI 345 Supplement 4 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

| Question # | Start Page | End Page |
|---------------------------------|------------|----------|
| RAI 345 — 09.02.01-27 | 2 | 3 |
| RAI 345 — 09.02.01-30 | 4 | 5 |
| RAI 345 — 09.02.01-33 | 6 | 6 |
| RAI 345 — 09.02.01-34 (d and e) | 7 | 9 |
| RAI 345 — 09.02.01-43 | 10 | 11 |

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

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

| Question # | Response Date |
|------------------------------------|-----------------|
| RAI 345 — 09.02.01-26 | August 31, 2010 |
| RAI 345 — 09.02.01-28 | August 31, 2010 |
| RAI 345 — 09.02.01-29 | August 31, 2010 |
| RAI 345 — 09.02.01-31 | August 31, 2010 |
| RAI 345 — 09.02.01-32 | August 31, 2010 |
| RAI 345 — 09.02.01-34 (a, b and c) | August 31, 2010 |

| | |
|-----------------------|-----------------|
| RAI 345 — 09.02.01-35 | August 31, 2010 |
| RAI 345 — 09.02.01-36 | August 31, 2010 |
| RAI 345 — 09.02.01-38 | August 31, 2010 |
| RAI 345 — 09.02.01-39 | August 31, 2010 |
| RAI 345 — 09.02.01-41 | August 31, 2010 |
| RAI 345 — 09.02.01-42 | August 31, 2010 |
| RAI 345 — 09.02.01-44 | August 31, 2010 |
| RAI 345 — 09.02.01-45 | August 31, 2010 |
| RAI 345 — 09.02.01-46 | August 31, 2010 |
| RAI 345 — 09.02.01-47 | August 31, 2010 |
| RAI 345 — 09.02.01-48 | August 31, 2010 |
| RAI 345 — 09.02.01-49 | August 31, 2010 |
| RAI 345 — 09.02.01-50 | August 31, 2010 |

Sincerely,

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From: BRYAN Martin (EXT)
Sent: Thursday, July 08, 2010 3:55 PM
To: 'Tesyfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); KOWALSKI David J (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 345, FSAR Ch. 9, Supplement 3

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the 25 questions in RAI No. 345 on April 2, 2010. Supplement 1 response to RAI No. 345 was sent on June 4, 2010 to provide a revised schedule. Supplement 2 response to RAI No. 345 was sent on June 22, 2010 to address two of the questions.

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

The schedule for technically correct and complete responses to the remaining 23 questions has been revised and is provided below.

| Question # | Response Date |
|-----------------------|-----------------|
| RAI 345 — 09.02.01-26 | August 31, 2010 |
| RAI 345 — 09.02.01-27 | July 16, 2010 |
| RAI 345 — 09.02.01-28 | August 31, 2010 |
| RAI 345 — 09.02.01-29 | August 31, 2010 |
| RAI 345 — 09.02.01-30 | July 16, 2010 |
| RAI 345 — 09.02.01-31 | August 31, 2010 |
| RAI 345 — 09.02.01-32 | August 31, 2010 |
| RAI 345 — 09.02.01-33 | July 16, 2010 |
| RAI 345 — 09.02.01-34 | July 16, 2010 |
| RAI 345 — 09.02.01-35 | August 31, 2010 |

| | |
|-----------------------|-----------------|
| RAI 345 — 09.02.01-36 | August 31, 2010 |
| RAI 345 — 09.02.01-38 | August 31, 2010 |
| RAI 345 — 09.02.01-39 | August 31, 2010 |
| RAI 345 — 09.02.01-41 | August 31, 2010 |
| RAI 345 — 09.02.01-42 | August 31, 2010 |
| RAI 345 — 09.02.01-43 | July 16, 2010 |
| RAI 345 — 09.02.01-44 | August 31, 2010 |
| RAI 345 — 09.02.01-45 | August 31, 2010 |
| RAI 345 — 09.02.01-46 | August 31, 2010 |
| RAI 345 — 09.02.01-47 | August 31, 2010 |
| RAI 345 — 09.02.01-48 | August 31, 2010 |
| RAI 345 — 09.02.01-49 | August 31, 2010 |
| RAI 345 — 09.02.01-50 | August 31, 2010 |

Sincerely,

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From: BRYAN Martin (EXT)
Sent: Tuesday, June 22, 2010 1:23 PM
To: 'Tesyfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); KOWALSKI David J (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 345, FSAR Ch. 9, Supplement 2

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the 25 questions in RAI No. 345 on April 2, 2010. Supplement 1 response to RAI No. 345 was sent on June 4, 2010 to provide a revised schedule.

The attached file, "RAI 345 Supplement 2 Response US EPR DC.pdf" provides technically correct and complete responses to two of the questions, as committed.

The following table indicates the respective pages in the response document, "RAI 345 Supplement 2 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

| Question # | Start Page | End Page |
|-----------------------|------------|----------|
| RAI 345 — 09.02.01-37 | 2 | 3 |
| RAI 345 — 09.02.01-40 | 4 | 4 |

The schedule for technically correct and complete responses to the remaining questions is unchanged and provided below.

| Question # | Response Date |
|-----------------------|---------------|
| RAI 345 — 09.02.01-26 | July 22, 2010 |
| RAI 345 — 09.02.01-27 | July 22, 2010 |

| | |
|-----------------------|---------------|
| RAI 345 — 09.02.01-28 | July 22, 2010 |
| RAI 345 — 09.02.01-29 | July 8, 2010 |
| RAI 345 — 09.02.01-30 | July 8, 2010 |
| RAI 345 — 09.02.01-31 | July 22, 2010 |
| RAI 345 — 09.02.01-32 | July 22, 2010 |
| RAI 345 — 09.02.01-33 | July 22, 2010 |
| RAI 345 — 09.02.01-34 | July 8, 2010 |
| RAI 345 — 09.02.01-35 | July 22, 2010 |
| RAI 345 — 09.02.01-36 | July 22, 2010 |
| RAI 345 — 09.02.01-38 | July 22, 2010 |
| RAI 345 — 09.02.01-39 | July 22, 2010 |
| RAI 345 — 09.02.01-41 | July 22, 2010 |
| RAI 345 — 09.02.01-42 | July 8, 2010 |
| RAI 345 — 09.02.01-43 | July 8, 2010 |
| RAI 345 — 09.02.01-44 | July 8, 2010 |
| RAI 345 — 09.02.01-45 | July 8, 2010 |
| RAI 345 — 09.02.01-46 | July 8, 2010 |
| RAI 345 — 09.02.01-47 | July 22, 2010 |
| RAI 345 — 09.02.01-48 | July 22, 2010 |
| RAI 345 — 09.02.01-49 | July 22, 2010 |
| RAI 345 — 09.02.01-50 | July 8, 2010 |

Sincerely,

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From: BRYAN Martin (EXT)
Sent: Friday, June 04, 2010 2:04 PM
To: 'Tefaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); KOWALSKI David J (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 345, FSAR Ch. 9, Supplement 1

Getachew,

AREVA NP Inc. provided a schedule for technically correct and complete responses to the 25 questions in RAI No. 345 on April 2, 2010.

The responses to the questions in RAI 345 are in various stages of preparation or review with the NRC. The revised response dates below are relative to the where the question is in this process.

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

| Question # | Response Date |
|-----------------------|---------------|
| RAI 345 — 09.02.01-26 | July 22, 2010 |
| RAI 345 — 09.02.01-27 | July 22, 2010 |
| RAI 345 — 09.02.01-28 | July 22, 2010 |

| | |
|-----------------------|---------------|
| RAI 345 — 09.02.01-29 | July 8, 2010 |
| RAI 345 — 09.02.01-30 | July 8, 2010 |
| RAI 345 — 09.02.01-31 | July 22, 2010 |
| RAI 345 — 09.02.01-32 | July 22, 2010 |
| RAI 345 — 09.02.01-33 | July 22, 2010 |
| RAI 345 — 09.02.01-34 | July 8, 2010 |
| RAI 345 — 09.02.01-35 | July 22, 2010 |
| RAI 345 — 09.02.01-36 | July 22, 2010 |
| RAI 345 — 09.02.01-37 | June 22, 2010 |
| RAI 345 — 09.02.01-38 | July 22, 2010 |
| RAI 345 — 09.02.01-39 | July 22, 2010 |
| RAI 345 — 09.02.01-40 | June 22, 2010 |
| RAI 345 — 09.02.01-41 | July 22, 2010 |
| RAI 345 — 09.02.01-42 | July 8, 2010 |
| RAI 345 — 09.02.01-43 | July 8, 2010 |
| RAI 345 — 09.02.01-44 | July 8, 2010 |
| RAI 345 — 09.02.01-45 | July 8, 2010 |
| RAI 345 — 09.02.01-46 | July 8, 2010 |
| RAI 345 — 09.02.01-47 | July 22, 2010 |
| RAI 345 — 09.02.01-48 | July 22, 2010 |
| RAI 345 — 09.02.01-49 | July 22, 2010 |
| RAI 345 — 09.02.01-50 | July 8, 2010 |

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
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From: BRYAN Martin (EXT)
Sent: Friday, April 02, 2010 5:34 PM
To: 'Tesyfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); KOWALSKI David J (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 345 (4021), FSAR Ch. 9

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 345 Response US EPR DC," provides a schedule since technically correct and complete responses to the twenty five questions are not provided.

The following table indicates the respective pages in the response document, "RAI 345 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

| Question # | Start Page | End Page |
|-----------------------|------------|----------|
| RAI 345 — 09.02.01-26 | 2 | 3 |
| RAI 345 — 09.02.01-27 | 4 | 4 |
| RAI 345 — 09.02.01-28 | 5 | 6 |

| | | |
|-----------------------|----|----|
| RAI 345 — 09.02.01-29 | 7 | 7 |
| RAI 345 — 09.02.01-30 | 8 | 8 |
| RAI 345 — 09.02.01-31 | 9 | 9 |
| RAI 345 — 09.02.01-32 | 10 | 10 |
| RAI 345 — 09.02.01-33 | 11 | 11 |
| RAI 345 — 09.02.01-34 | 12 | 13 |
| RAI 345 — 09.02.01-35 | 14 | 15 |
| RAI 345 — 09.02.01-36 | 16 | 17 |
| RAI 345 — 09.02.01-37 | 18 | 18 |
| RAI 345 — 09.02.01-38 | 19 | 19 |
| RAI 345 — 09.02.01-39 | 20 | 20 |
| RAI 345 — 09.02.01-40 | 21 | 21 |
| RAI 345 — 09.02.01-41 | 22 | 22 |
| RAI 345 — 09.02.01-42 | 23 | 23 |
| RAI 345 — 09.02.01-43 | 24 | 24 |
| RAI 345 — 09.02.01-44 | 25 | 25 |
| RAI 345 — 09.02.01-45 | 26 | 26 |
| RAI 345 — 09.02.01-46 | 27 | 27 |
| RAI 345 — 09.02.01-47 | 28 | 28 |
| RAI 345 — 09.02.01-48 | 29 | 29 |
| RAI 345 — 09.02.01-49 | 30 | 31 |
| RAI 345 — 09.02.01-50 | 32 | 32 |

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

| Question # | Response Date |
|-----------------------|----------------------|
| RAI 345 — 09.02.01-26 | June 4, 2010 |
| RAI 345 — 09.02.01-27 | June 4, 2010 |
| RAI 345 — 09.02.01-28 | June 4, 2010 |
| RAI 345 — 09.02.01-29 | June 4, 2010 |
| RAI 345 — 09.02.01-30 | June 4, 2010 |
| RAI 345 — 09.02.01-31 | June 4, 2010 |
| RAI 345 — 09.02.01-32 | June 4, 2010 |
| RAI 345 — 09.02.01-33 | June 4, 2010 |
| RAI 345 — 09.02.01-34 | June 4, 2010 |
| RAI 345 — 09.02.01-35 | June 4, 2010 |
| RAI 345 — 09.02.01-36 | June 4, 2010 |
| RAI 345 — 09.02.01-37 | June 4, 2010 |
| RAI 345 — 09.02.01-38 | June 4, 2010 |
| RAI 345 — 09.02.01-39 | June 4, 2010 |
| RAI 345 — 09.02.01-40 | June 4, 2010 |
| RAI 345 — 09.02.01-41 | June 4, 2010 |
| RAI 345 — 09.02.01-42 | June 4, 2010 |
| RAI 345 — 09.02.01-43 | June 4, 2010 |
| RAI 345 — 09.02.01-44 | June 4, 2010 |
| RAI 345 — 09.02.01-45 | June 4, 2010 |
| RAI 345 — 09.02.01-46 | June 4, 2010 |
| RAI 345 — 09.02.01-47 | June 4, 2010 |
| RAI 345 — 09.02.01-48 | June 4, 2010 |
| RAI 345 — 09.02.01-49 | June 4, 2010 |
| RAI 345 — 09.02.01-50 | June 4, 2010 |

Sincerely,

Martin (Marty) C. Bryan
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Martin.Bryan@areva.com

From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Thursday, March 04, 2010 2:49 PM
To: ZZ-DL-A-USEPR-DL
Cc: Wheeler, Larry; Lee, Samuel; Segala, John; Hearn, Peter; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 345 (4021), FSAR Ch. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on December 10, 2009, and discussed with your staff on March 4, 2010. Drat RAI Questions 09.02.01-31, 09.02.01-47, and 09.02.01-48 were modified as a result of that discussion. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 1998

Mail Envelope Properties (BC417D9255991046A37DD56CF597DB71078D6972)

Subject: Response to U.S. EPR Design Certification Application RAI No. 345, FSAR Ch. 9, Supplement 6
Sent Date: 9/14/2010 5:32:39 PM
Received Date: 9/14/2010 5:32:43 PM
From: BRYAN Martin (EXTERNAL AREVA)

Created By: Martin.Bryan.ext@areva.com

Recipients:

"DELANO Karen (AREVA)" <Karen.Delano@areva.com>
Tracking Status: None
"ROMINE Judy (AREVA)" <Judy.Romine@areva.com>
Tracking Status: None
"BENNETT Kathy (AREVA)" <Kathy.Bennett@areva.com>
Tracking Status: None
"KOWALSKI David (AREVA)" <David.Kowalski@areva.com>
Tracking Status: None
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Tracking Status: None

Post Office: AUSLYNCMX02.adom.ad.corp

| Files | Size | Date & Time |
|---|-------------|------------------------|
| MESSAGE | 18999 | 9/14/2010 5:32:43 PM |
| RAI 345 Supplement 6 Response US EPR DC.pdf | | 229449 |

Options

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

Response to

Request for Additional Information No. 345, Supplement 6

3/04/2010

U.S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

SRP Section: 09.02.01 - Station Service Water System

Application Section: 9.2.1

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

Question 09.02.01-26:

Follow-up to RAI 119, Question 9.2.1-01

The essential service water system (ESWS) must be able to withstand natural phenomena without the loss of function in accordance with 10 CFR 50, Appendix A, General Design Criterion (GDC) 2 requirements. The criteria that are specified in Tier 2 of the Final Safety Analysis Report (FSAR), Section 3.2, indicate that non-safety-related parts of the ESWS should be designated as Seismic Category II if a failure under seismic loading conditions could prevent or reduce the functional capability of a safety-related structure, system, or component (SSC). The staff found that insufficient information was provided to determine if the seismic designation for non-safety-related parts of the ESWS is appropriate. Also, the staff noted that the information on Tier 2 Figure 9.2.1-1, "Essential Service Water System Piping & Instrumentation Diagram," (P&ID) was inconsistent with the information in Tier 2 FSAR Table 3.2.2-1, "Classification Summary," in that the table (Sheet 94) shows that the dedicated ESWS pump is classified as non-safety-related supplemental grade (NS-AQ), Seismic Category II and the P&ID shows the dedicated ESWS pump as simply non-safety-related. The applicant needs to provide additional information in Tier 2 FSAR Section 9.2.1 to fully explain why the non-safety-related parts of the ESWS are not classified as Seismic Category II (i.e., why the assumed simultaneous failure of all non-safety-related ESWS piping will not adversely affect safety-related parts of the ESWS or any other safety-related SSCs that are in the same general area as the non-safety-related ESWS piping), and to explain the inconsistency noted above with respect to the Seismic Category II designation for the dedicated ESWS pump, and why other parts of the dedicated ESWS are not similarly designated as NS-AQ, Seismic Category II in Table 3.2.2-1 and on the P&ID.

Based on the staff's review response to RAI 119, Question 9.2.1-01 and an audit by the staff conducted on October 27, 2009, the following items remain open and require further resolution and/or clarification by the applicant requiring Tier 1 FSAR changes.

As part of the FSAR markup for this RAI, FSAR Tier 1 Table 2.7.11-2 "ESWS I&C and Electrical Design" has been modified to identify alternate power from the SBO diesel generators for some but not all of the dedicated train powered components. For example;

- a. For dedicated train components, such as MOVs 30PEB80 AA015 (pump recirculation) and AA016 (basin blow down), an alternate power source is not identified; therefore, these components will not be functional under conditions when alternate power is necessary.
- b. Dedicated train filter is needed to assure operability of the dedicated train; therefore, an alternate power source should be identified for this equipment. However, Table 2.7.11-2 does not include this information.
- c. Tier 1 Tables 2.7.11-1 and 2.7.11-2 incorrectly identifies valve 30PEB80 AA003 as the "dedicated train emergency blow down isolation valve," since this valve is actually located at the inlet to the dedicated CCWS heat exchanger as shown in Figure 2.7.11-1 (sheet 5).
- d. The description of the dedicated train filter blow down valve (30PEB80 AA009) and the basin blow down valve (30PEB80 AA016) shown in Table 2.7.11-1 is inconsistent with the information in Figure 2.7.11-1.

Response to Question 09.02.01-26:

- a) U.S. EPR FSAR Tier 1, Table 2.7.11-2 contains the IEEE Class 1E source and, as applicable for certain components, a Class 1E alternate feed source. The indications of station blackout (SBO) in U.S. EPR FSAR Tier 1, Table 2.7.11-2 for the dedicated essential service water (ESW) pump and dedicated filter blowdown isolation valve have been deleted in the Response to RAI 334, Question 09.02.02-76. SBO is not a Class 1E alternate feed source as indicated in U.S. EPR FSAR Tier 1, Table 2.7.11-2, Note 2. Items identified in U.S. EPR FSAR Tier 1, Table 2.7.11-2 as “dedicated” components can be supplied by a standby emergency diesel generator (EDG) or a station blackout diesel generator (SBODG) that is an alternate ac power source. The EDG commitment and ITAAC are described in U.S. EPR FSAR Tier 1, Section 2.7.11, Item 5.1.

U.S. EPR FSAR Tier 1, Section 2.7.11, Item 5.4 will be added as follows:

“Items identified in Table 2.7.11-2 as “Dedicated” ESWS motor-operated components are capable of being supplied by a SBODG.”

U.S. EPR FSAR Tier 1, Table 2.7.11-2, Note 3 will be added as follows:

“3) “Dedicated” components are non-Class 1E components but are powered from the Class 1E Division as shown.”

The following text will be added to U.S. EPR FSAR Tier 1, Table 2.7.11-3:

| | | | |
|-----|--|--|--|
| 5.4 | Items identified in Table 2.7.11-2 as “Dedicated” ESWS motor-operated components are capable of being supplied by a SBODG. | Testing will be performed for motor-operated components designated as “Dedicated” in Table 2.7.11-2 by providing a test signal with the SBODG. | The test signal provided by the SBODG is present at the respective “Dedicated” component identified in Table 2.7.11-2. |
|-----|--|--|--|

The following text will be added to U.S. EPR FSAR Tier 2, Section 9.2.1.4.1:

“Dedicated ESWS motor-operated components are capable of being supplied by a standby EDG or a station blackout diesel generator (SBODG) that is provided as an alternate ac power source.”

- b) The alternate ac power source for the dedicated train filter is described in the Response to Part a. U.S. EPR FSAR Tier 2, Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design will be revised to add the dedicated train filter 30PEB80AT001.
- c) U.S. EPR FSAR Tier 1, Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design 1 has been revised to delete the duplicate and incorrect line item for isolation valve 30PEB80AA003. For clarity and consistency, “Dedicated” has been added to the descriptions of 30PEB80AA003 and 30PEB80AA004.

U.S. EPR FSAR Tier 1, Table 2.7.11-2 has been revised to delete valve 30PEB80AA003 because it is a manual valve.

U.S. EPR FSAR Tier 2, Table 3.9.6-2—Inservice Valve Testing Program Requirements has been revised to delete valve 30PEB80AA003.

- d) The description of the dedicated train filter blowdown valve (30PEB80AA009) and the basin blowdown valve (30PEB80AA016) shown in U.S. EPR FSAR Tier 1, Table 2.7.11-1 has been revised for consistency with the information in U.S. EPR FSAR Tier 2, Figure 2.7.11-1—Essential Service Water System Functional Arrangement.

FSAR Impact:

U.S. EPR FSAR Tier 1, Section 2.7.11, Table 2.7.11-1, Table 2.7.11-2, Table 2.7.11-3 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR FSAR Tier 2, Section 9.2.1.4.1 will be revised as described in the response and indicated on the enclosed markup.

Question 09.02.01-31:

Follow-up to RAI 119, Question 9.2.1-04(j)

The ESWS must be capable of removing heat from structures, systems and components (SSCs) important to safety during normal operating and accident conditions over the life of the plant in accordance with GDC 44 requirements. The ESWS description and P&ID were reviewed to assess the design adequacy of the ESWS for performing its heat removal functions. While the P&ID shows the ESWS components and identifies the boundaries between safety-related and non-safety-related parts of the system, some of the information is incomplete, inaccurate, or inconsistent. Consequently, the applicant needs to revise the FSAR to address the following considerations in this regard:

Part (j)- Confirm that the ESWS backwash filter motor and power supply are classified as safety-related, Class 1E.

Based on the staff's review of response to RAI 119, Question 9.2.1-04 and an audit by the staff conducted on October 27, 2009, Part (j) remains open and requires further resolution and/or clarification by the applicant. The following description provides the results of the staff's evaluation of the applicant's initial response and justification for the item remaining open.

In part (j) of RAI 9.2.1-04, the staff requested that the applicant confirm that the ESWS filter motor and its power source is classified as safety-related, class 1E. The applicant's response confirmed this information, however Tier 1 Table 2.7.11-2 was not updated to reflect this information, as the filter motor should be listed as an IEEE Class 1E component for the four divisions.

Response to Question 09.02.01-31:

- j) U.S. EPR FSAR Tier 1, Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design will be revised to reflect that the filter motor associated with the essential service water (ESW) debris filter is listed as an IEEE Class 1E component for the four divisions.

U.S. EPR FSAR Tier 1, Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design and U.S. EPR FSAR Tier 2, Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment will be revised to add the ESW debris filters 30PEB10/20/30/40 AT002.

FSAR Impact:

U.S. EPR FSAR Tier 1, Table 2.7.11-1 and Table 2.7.11-2 will be revised as described in the response and indicated on the enclosed markup.

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

Question 09.02.01-44:

Follow-up to RAI 119, Question 9.2.1-20

Applications for standard plant design approval must contain proposed inspections, tests, analyses, and acceptance criteria (ITAAC) in accordance with 10 CFR 52.47(b)(1) requirements. Tier 1 FSAR Section 2.7.11, "Essential Service Water System," provides EPR design certification information and ITAAC for the ESWS and UHS. The staff noted that the title for Tier 1 FSAR Section 2.7.11 is misleading in that it includes requirements for the UHS along with those that are specified for the ESWS. However, the ESWS and the UHS each involve significant safety considerations that are described separately in Tier 2 of the FSAR and are reviewed separately by the staff in this report. Therefore, consistent with the approach that is used in Tier 2 of the FSAR, the applicant needs to provide the required Tier 1 information for the ESWS and the UHS in their own respective sections.

Based on the staff's review of response to RAI 119, Question 9.2.1-20 and an audit by the staff conducted on October 27, 2009, this item remains open and requires further resolution and/or clarification by the applicant. The following description provides the results of the staff's evaluation of the applicant's initial response and justification for the item remaining open.

- a. Tier 1 Section 2.7.11 title, "Essential Service Water System," is still misleading since it includes "PEB" and "PED" equipment.
- b. UHS equipment such as the UHS fans (for example 30PED10 AN001 and AN002) are not listed or described in any Tier 1 tables.
- c. UHS is not fully discussed in Tier 1, Section 2.7.11, Section 1.0, "Description," Section 2.0, "Arrangement," Section 3.0. Mechanical Design Features," and etc for the UHS fans.

Response to Question 09.02.01-44:

- a) The U.S. EPR FSAR Tier 1, Section 2.7.11, "Essential Service Water System," will not be renamed to add Ultimate Heat Sink to the title. PEB and PED equipment have phenomenological evaluation (PE) (essential service water (ESW)) designations. References to U.S. EPR FSAR Tier 1, Section 2.7.11 in the U.S. EPR FSAR would be impacted.
- b) The ultimate heat sink (UHS) cooling tower fans were added to U.S. EPR FSAR Tier 1, Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design in the Response to RAI 175, Question 09.02.05-17(g). U.S. EPR FSAR Tier 1, Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design will be revised to include the UHS cooling tower fans. U.S. EPR FSAR Tier 1, Table 2.7.11-3—Essential Service Water System ITAAC does not require a revision.

Cooling tower fans are components in the U.S. EPR UHS, which is subject to requirements of RG1.27, Revision 2, "Ultimate Heat Sink at Nuclear Power Plants." RG 1.27, Revision 2 does not directly discuss cooling tower fans or identify quality standards for cooling tower fans. Cooling tower fans are not part of the pressure boundary for any fluid system. The cooling tower fans mechanical function and location in cooling towers is analogous to the function and location of pump impellers, which are explicitly excluded from quality group

classification review by SRP 3.2.2 Rev 4, Part I, Areas of Review, Paragraph 1. No quality standard is identified in U.S. EPR FSAR Tier 2, Table 3.2.2-1—Classification Summary for the cooling tower fans. In U.S. EPR FSAR Tier 1, Table 2.7.11-1, the ASME Code Section III column states “No.” Refer to the Response to RAI 72, Question 03.02.02-5 for more information.

- c) U.S. EPR FSAR Tier 1, Section 2.7.11, Item 1.0, “Description,” paragraph 2, will be revised to include the following statement:

“The ESWS and UHS provide the following safety-related functions:”

U.S. EPR FSAR Tier 1, Section 2.7.11, Item 1.0, “Description,” paragraph 2, will be revised to include the following bullet:

“The UHS provides heat removal from the ESWS during normal operation and accident conditions, and transfers that energy to the environment.”

U.S. EPR FSAR Tier 1, Section 2.7.11, Item 2.1 will be revised to include the following statement:

“The functional arrangement of the ESWS and UHS is as shown in Figure 2.7.11-1—Essential Service Water System Functional Arrangement.”

The UHS cooling tower fans have been added to U.S. EPR FSAR Tier 1, Table 2.7.11-1. UHS components listed in U.S. EPR FSAR Tier 1, Table 2.7.11-1 are subject to the applicable design feature requirements of U.S. EPR FSAR Tier 1, Section 2.7.11, Item 3.0. No revision to U.S. EPR FSAR Tier 1, Section 2.7.11, Item 3.0, “Mechanical Design Features” is required.

FSAR Impact:

U.S. EPR FSAR Tier 1, Section 2.7.11 and Table 2.7.11-1 will be revised as described in the response and indicated on the enclosed markup.

Question 09.02.01-45:

Follow-up to RAI 119, Question 9.2.1-21

Applications for standard plant design approval must contain proposed ITAAC in accordance with 10 CFR 52.47(b)(1) requirements. Proposed ITAAC for the ESWS are provided in Tier 1 FSAR Section 2.7.11. The staff reviewed the descriptive information, arrangement, design features, environmental qualification, performance requirements, and interface information provided in Tier 1 FSAR Section 2.7.11 to confirm completeness and consistency with the plant design basis as described in Tier 2 Section 9.2.1. The staff found that the Tier 1 information is incomplete, inconsistent, inaccurate, or that clarification is needed and the applicant needs to revise the Tier 1 information to address the following considerations in this regard:

Part 2 question: In the listing of safety-related functions, the first bullet does not include the capability to remove heat from the ESWS pump room cooler. This is not consistent with the ESWS design basis.

Based on the staff's review of response to RAI 119, Question 9.2.1-21 and an audit by the staff conducted on October 27, 2009, this item remains open and requires further resolution and/or clarification by the applicant. The following description provides the results of the staff's evaluation of the applicant's initial response and justification for the item remaining open.

The applicant should reconsider adding back the 'EDG cooling' to Tier 1. The applicant had removed EDG cooling as part of this RAI response from the Tier 1 list of ESW system safety-related functions. The applicant states that "safety significance" is used to determine if a design function is of sufficient importance to be included in the Tier 1 list of safety-related functions and provides criteria used to determine safety significance. One such criterion provided by the applicant states key features that provide functions credited in the key safety analyses. Since the availability of on-site class 1E power is a basic assumption of typical DBA analysis and the EDGs cannot function without cooling water, the applicant should reconsider the removal of the EDG cooling function from Tier 1, and ITAAC Item 7.1 and 7.6 should be restored to recognize that the flow rate specified as acceptance criteria includes flow to individual heat exchangers including the CCWS HX, EDG and ESW pump room coolers.

Response to Question 09.02.01-45:

The emergency diesel generator (EDG) cooling function will be reincorporated into U.S. EPR FSAR Tier 1, Section 2.7.11, and ITAAC Items 7.1 and 7.6 will be restored to recognize that the flow rate specified as acceptance criteria includes flow to individual heat exchangers (HX), including the component cooling water system (CCWS) HX, EDG, and essential service water (ESW) pump room coolers.

The total design heat load of 3.139E+08 BTU/hr provided as the acceptance criteria for U.S. EPR FSAR Tier 1, Section 2.7.11, Item 7.1 is the total heat load from the CCWS and EDG heat exchangers and the essential service water pump building ventilation system (ESWPBVS) room cooler as provided in U.S. EPR FSAR Tier 2, Table 9.2.5-1—Ultimate Heat Sink System Interface as 291.3E+06, 22.0E+06, and 0.619E+06 BTU/hr, respectively.

U.S. EPR FSAR Tier 1, Section 2.7.11 and Table 2.7.11-3—Essential Service Water System ITAAC will be revised to include the information in this response.

FSAR Impact:

U.S. EPR FSAR Tier 1, Section 2.7.11 and Table 2.7.11-3 will be revised as described in the response and indicated on the enclosed markup.

Question 09.02.01-47:

Follow-up to RAI 119, Question 9.2.1-22

Applications for standard plant design approval must contain proposed ITAAC in accordance with 10 CFR 52.47(b)(1) requirements. Proposed ITAAC for the ESWS are provided in Tier 1 FSAR Section 2.7.11. The staff reviewed the information provided in Table 2.7.11-3, "Essential Service Water System Inspections, Tests, Analyses, and Acceptance Criteria," to confirm that the proposed ITAAC are adequate for EPR design certification. In addition to the items referred to in RAI 9.2.1-1 through -9 and RAI 9.2.1-21, some of which involve ITAAC considerations, the staff found that the proposed ITAAC are incomplete, inconsistent, inaccurate, or that clarification is needed and the applicant needs to revise the Tier 1 information to address the following considerations in this regard:

Part 3- Item 7.2 needs to specify that ESWS pump testing to demonstrate adequate net positive suction head will be completed at the maximum ESWS flow rate conditions, with the inventory in the cooling tower basin at the lowest allowable level (as corrected to account for actual temperature and atmospheric pressure conditions). The maximum ESWS flow rate and minimum allowable cooling tower basin water level, along with the corresponding design basis water temperature and atmospheric pressure that apply need to be listed to assure that test conditions are properly established. The acceptance criteria for an acceptable test need to be specified.

Based on the staff's review of response to RAI 119, Question 9.2.1-22 and an audit by the staff conducted on October 27, 2009, this item remains open and requires further resolution and/or clarification by the applicant. The following description provides the results of the staff's evaluation of the applicant's initial response and justification for the item remaining open.

The applicant's response to part 3 of RAI 9.2.1-22 stated that ITAAC Item 7.2 would be revised to specify that ESWS pump testing to demonstrate adequate net positive suction head—net positive suction head actual (NPSHA) must be greater than net positive suction head required (NPSHR). The testing will be completed at the maximum ESWS flow rate conditions, with consideration for the inventory in the cooling tower basin at the lowest allowable level (as corrected to account for actual temperature and atmospheric pressure conditions). The applicant did not identify the ESWS pump NPSH design conditions as requested for this ITAAC. These parameters are necessary to enable comparison with test data obtained at actual conditions. These parameters include maximum ESWS pump flow rate and minimum cooling tower basin water level, along with the corresponding design basis water temperature and atmospheric pressure.

Response to Question 09.02.01-47:

Refer to the Response to RAI 345, Supplement 4, Question 09.02.01-34 (Part e) and RAI 345, Question 09.02.01-41 for information regarding net positive suction head (NPSH) design conditions. The maximum essential service water system (ESWS) pump flow rate corresponds to the normal ESWS pump flow rate (19,340 gpm).

The maximum ESWS pump flow rate, minimum cooling tower basin water level, and corresponding design basis water temperature are provided in U.S EPR FSAR Tier 2, Section 9.2.1 and Section 9.2.5.

Maximum ESWS flow rate = 19,340 gpm (refer to U.S. EPR FSAR Tier 2, Table 9.2.1-1—Essential Service Water Design Parameters).

Minimum allowable cooling tower basin water level = elev. -6.08 ft. (72 hours post design basis accident (DBA)) (refer to U.S. EPR FSAR Tier 2, Table 9.2.1-1 and Figure 9.2.5-5).

Maximum basin water temperature = 95°F (72 hours post DBA) (refer to U.S. EPR FSAR Tier 2, Table 9.2.1-1).

Atmospheric pressure _{SEA LEVEL} = 14.69 psia (33.93 ft).

U.S. EPR FSAR Tier 1, Table 2.7.11-3—Essential Service Water System ITAAC will be revised to include the information in this response.

FSAR Impact:

U.S. EPR FSAR Tier 1, Table 2.7.11-3 will be revised as described in the response and indicated on the enclosed markup.

Question 09.02.01-50:

Follow-up to RAI 119, Question 9.2.1-21

Applications for standard plant design approval must contain proposed ITAAC in accordance with 10 CFR 52.47(b)(1) requirements. Proposed ITAAC for the ESWS are provided in Tier 1 FSAR Section 2.7.11. The staff reviewed the descriptive information, arrangement, design features, environmental qualification, performance requirements, and interface information provided in Tier 1 FSAR Section 2.7.11 to confirm completeness and consistency with the plant design basis as described in Tier 2 Section 9.2.1. The staff found that the Tier 1 information is incomplete, inconsistent, inaccurate, or that clarification is needed and the applicant needs to revise the Tier 1 information to address the following considerations in this regard:

Part 13 question: Figure 2.7.11-1, "Essential Service Water System Functional Arrangement," does not show nominal pipe sizes, which are necessary for design certification.

Based on the staff's review of response to RAI 119, Question 9.2.1-21, the following related item was identified.

Tier 1 Figure 2.7.11-1 does not clearly show ASME Code Classifications, for example, ASME Class 2 or 3, reference Appendix A to RG 1.206, Page C.II.1-A-1, item 4. The applicant should consider adding this information to Tier 1 Figure 2.7.11-1.

Response to Question 09.02.01-50:

Refer to the Response to RAI 399, Question 14.03.03-47.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

U.S. EPR Final Safety Analysis Report Markups

2.7.11 Essential Service Water System

1.0 Description

The essential service water system (ESWS) is a safety-related system that provides cooling water to the component cooling water system (CCWS) heat exchangers, the emergency diesel generator (EDG) heat exchangers, and the essential service water pump building ventilation system (ESWPBVS) room coolers under normal operating, shutdown/cooldown, design basis events. The Ultimate Heat Sink (UHS) dissipates heat rejected from the ESW during normal operation and post accident shutdown.

The ESWS and UHS provide the following safety-related functions~~The ESWS provides the following safety-related functions:~~

- The ESWS provides the capability to transfer heat from CCWS and EDG to the environment following an anticipated operational occurrence (AOO) or postulated accident.
- The ESWS provides continued heat transfer from the fuel pool cooling system (FPCPS) via the CCWS as long as any fuel assemblies are in the spent fuel storage pool located outside containment.

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• The UHS provides heat removal from the ESWS during normal operation and accident conditions, and transfers that energy to the environment.

- The ESW emergency makeup water system and blowdown system isolation valves provide automatic isolation of the tower basins under DBA conditions to prevent loss of tower water inventory.
- Each UHS cooling tower basin is sized to contain sufficient water to allow for 72 hours of ESW train operation under DBE conditions without addition of makeup water. The water level in the basin at the end of the 72 hour period is sufficient to meet pump minimum suction head (NPSH) requirements.
- After 72 hours have elapsed since the initiation of design basis event, the ESW emergency makeup water system provides water to the ESW system to replenish cooling water lost to evaporation, drift, blowdown and other losses in order to ensure cooling tower basin water levels remain within established limits under DBE conditions.
- The site specific ESW emergency makeup water system will provide this makeup water for at least 27 days following the initial 72 hour post-accident period (balance of 30 day scenario).

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

- The ESWS provides the cooling of the system users during all normal plant operating conditions.
- Deleted.

- The ESW normal makeup water system provides makeup water to the ESW system to replenish cooling water lost to evaporation, drift, and other losses in order to ensure cooling tower basin water levels remain within established limits.
- The ESW system provides the means of transferring heat loads from the dedicated CCW heat exchanger under severe accident conditions to ensure containment integrity.
- Freeze protection is provided by diverting ESW return flow directly to the tower basin and controlling fan operation under low load/low ambient temperature conditions.

The non-safety-related dedicated ESWS train provides water as a cooling medium to the non-safety-related dedicated CCWS train heat exchanger and to the division 4 ESWS ESWPBVS room cooler for the removal of reject heat under severe accident conditions.

2.0 Arrangement

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2.1 The functional arrangement of the ESWS and UHS is as shown in Figure 2.7.11-1—Essential Service Water System Functional Arrangement. ~~The functional arrangement of the ESWS is as shown on Figure 2.7.11-1—Essential Service Water System Functional Arrangement.~~

2.2 The location of the ESWS equipment is as listed in Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design.

2.3 Physical separation exists between divisions of the ESWS.

2.4 Deleted.

2.5 Deleted.

3.0 Mechanical Design Features

3.1 Deleted.

3.2 Check valves listed in Table 2.7.11-1 will function as listed in Table 2.7.11-1.

3.3 Deleted.

3.4 Components identified as Seismic Category I in Table 2.7.11-1 can withstand seismic design basis loads without a loss of the function listed in Table 2.7.11-1.

3.5 Components listed in Table 2.7.11-1 as ASME Code Section III are designed in accordance with ASME Code Section III requirements.

3.6 Components listed in Table 2.7.11-1 as ASME Code Section III are fabricated in accordance with ASME Code Section III requirements.

3.7 Pressure boundary welds on components listed in Table 2.7.11-1 as ASME Code Section III are in accordance with ASME Code Section III requirements.

5.0 Electrical Power Design Features

5.1 The components designated as Class 1E in Table 2.7.11-2 are powered from the Class 1E division as listed in Table 2.7.11-2 in a normal or alternate feed condition.

5.2 Valves listed in Table 2.7.11-2 fail as-is on loss of power.

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5.3 Deleted.



5.4 Items identified in Table 2.7.11-2 as “Dedicated” ESWS motor-operated components are capable of being supplied by a SBODG.

6.0 Environmental Qualifications

6.1 Deleted.

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7.0 Equipment and System Performance



7.1 The ESWS UHS as listed in Table 2.7.11-1 has the capacity to remove the design heat load from the CCWS and EDG heat exchangers, and the ESWPBVS room cooler.

7.2 The pumps listed in Table 2.7.11-1 have sufficient net positive suction head available (NPSHA) ~~that is greater than net positive suction head required (NPSHR) at system run-out flow.~~

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7.3 Class 1E valves listed in Table 2.7.11-2 can perform the function listed in Table 2.7.11-1 under system operating conditions.

7.4 The ESWS provides for flow testing of the ESWS pumps during plant operation.

7.5 Deleted.

7.6 The ESWS delivers water to the CCWS and EDG heat exchangers and the ESWPBVS room coolers.

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8.0 Interface Requirements

8.1 The site specific emergency makeup water system provides 300 gpm makeup water to each ESW cooling tower basin to maintain the minimum basin water level.

9.0 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.11-3 lists the ESWS ITAAC.

Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (6 Sheets)

| Description | Tag Number ⁽¹⁾ | Location | ASME Code Section III | Function |
|--|---------------------------|--------------------------------------|-----------------------|-----------------|
| ESWS Pump Division 1 | 30PEB10AP001 | ESW Pump Structure Division 1 | Yes | Run |
| Recirc Isolation Valve Division 1 | 30PEB10AA002 | ESW Pump Structure Division 1 | Yes | Close |
| Emer. Blowdown Isolation Valve Division 1 | 30PEB10AA003 | ESW Pump Structure Division 1 | Yes | Close |
| Pump Discharge Isolation Valve Division 1 | 30PEB10AA005 | ESW Pump Structure Division 1 | Yes | Open |
| Filter Blowdown Isolation Valve Division 1 | 30PEB10AA015 | ESW Pump Structure Division 1 | Yes | Close |
| Blowdown Isolation Valve Division 1 | 30PEB10AA016 | ESW Pump Structure Division 1 | Yes 09.02.01-31 | Close |
| Pump Discharge Check Valve Division 1 | 30PEB10AA204 | ESW Pump Structure Division 1 | Yes ↓ | Open |
| <u>ESW Debris Filter Division 1</u> | <u>30PEB10AT002</u> | <u>ESW Pump Structure Division 1</u> | <u>Yes</u> | <u>Backwash</u> |
| Tower Isolation Valve Division 1 | 30PED10AA010 | ESW Pump Structure Division 1 | Yes | Open |
| Tower Bypass Isolation Valve Division 1 | 30PED10AA011 | ESW Pump Structure Division 1 | Yes | Close |
| Makeup Water Isolation Valve Division 1 | 30PED10AA019 | ESW Pump Structure Division 1 | Yes | Close |

Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (6 Sheets)

| Description | Tag Number ⁽¹⁾ | Location | ASME Code Section III | Function |
|---|---------------------------|--------------------------------------|-----------------------|-----------------|
| Emer. Makeup Water Isolation Valve Division 1 | 30PED10AA021 | ESW Pump Structure Division 1 | Yes | Open |
| Makeup Water Check Valve Division 1 | 30PED10AA220 | ESW Pump Structure Division 1 | Yes | Close |
| ESWS Pump Division 2 | 30PEB20AP001 | ESW Pump Structure Division 2 | Yes | Run |
| Recirc Isolation Valve Division 2 | 30PEB20AA002 | ESW Pump Structure Division 2 | Yes | Close |
| Emer. Blowdown Isolation Valve Division 2 | 30PEB20AA003 | ESW Pump Structure Division 2 | Yes | Close |
| Pump Discharge Isolation Valve Division 2 | 30PEB20AA005 | ESW Pump Structure Division 2 | Yes | Open |
| Filter Blowdown Isolation Valve Division 2 | 30PEB20AA015 | ESW Pump Structure Division 2 | Yes | Close |
| Blowdown Isolation Valve Division 2 | 30PEB20AA016 | ESW Pump Structure Division 2 | Yes | Close |
| Pump Discharge Check Valve Division 2 | 30PEB20AA204 | ESW Pump Structure Division 2 | Yes | Open |
| <u>ESW Debris Filter Division 2</u> | <u>30PEB20AT002</u> | <u>ESW Pump Structure Division 2</u> | <u>Yes</u> | <u>Backwash</u> |

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Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (6 Sheets)

| Description | Tag Number ⁽¹⁾ | Location | ASME Code Section III | Function |
|--|---------------------------|--|-----------------------|-----------------|
| Blowdown Isolation Valve Division 3 | 30PEB30AA016 | ESW Pump Structure Division 3 | Yes | Close |
| Pump Discharge Check Valve Division 3 | 30PEB30AA204 | ESW Pump Structure Division 3 | Yes | Open |
| <u>ESW Debris Filter Division 3</u> | <u>30PEB30AT002</u> | <u>ESW Pump Structure Division 3</u> | <u>Yes</u> | <u>Backwash</u> |
| Tower Isolation Valve Division 3 | 30PED30AA010 | ESW Pump Structure Division 3 | Yes | Open |
| Tower Bypass Isolation Valve Division 3 | 30PED30AA011 | ESW Pump Structure Division 3 | Yes | Close |
| Makeup Water Isolation Valve Division 3 | 30PED30AA019 | ESW Pump Structure Division 3 | Yes | Close |
| Emer. Makeup Water Isolation Valve Division 3 | 30PED30AA021 | ESW Pump Structure Division 3 | Yes | Open |
| Makeup Water Check Valve Division 3 | 30PED30AA220 | ESW Pump Structure Division 3 | Yes | Close |
| ESWS Pump Division 4 | 30PEB40AP001 | ESW Pump Structure Division 4 | Yes | Run |
| Recirc Isolation Valve Division 4 | 30PEB40AA002 | ESW Pump Structure Division 4 | Yes | Close |

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Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (6 Sheets)

| Description | Tag Number ⁽¹⁾ | Location | ASME Code Section III | Function |
|---|---------------------------|--------------------------------------|-----------------------|-----------------|
| Emer. Blowdown Isolation Valve Division 4 | 30PEB40AA003 | ESW Pump Structure Division 4 | Yes | Close |
| Pump Discharge Isolation Valve Division 4 | 30PEB40AA005 | ESW Pump Structure Division 4 | Yes | Open |
| Filter Blowdown Isolation Valve Division 4 | 30PEB40AA015 | ESW Pump Structure Division 4 | Yes | Close |
| Blowdown Isolation Valve Division 4 | 30PEB40AA016 | ESW Pump Structure Division 4 | Yes | Close |
| Pump Discharge Check Valve Division 4 | 30PEB40AA204 | ESW Pump Structure Division 4 | Yes | Open |
| Dedicated System Check Valve Upstr 30saq40 Ac001 Division 4 | 30PEB41AA011 | ESW Pump Structure Division 4 | Yes | Open |
| <u>ESW Debris Filter Division 4</u> | <u>30PEB40AT002</u> | <u>ESW Pump Structure Division 4</u> | <u>Yes</u> | <u>Backwash</u> |
| Tower Isolation Valve Division 4 | 30PED40AA010 | ESW Pump Structure Division 4 | Yes | Open |
| Tower Bypass Isolation Valve Division 4 | 30PED40AA011 | ESW Pump Structure Division 4 | Yes | Close |

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Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (6 Sheets)

| Description | Tag Number ⁽¹⁾ | Location | ASME Code Section III | Function |
|---|---------------------------|---|-----------------------|----------|
| Makeup Water Isolation Valve Division 4 | 30PED40AA019 | ESW Pump Structure Division 4 | Yes | Close |
| Emer. Makeup Water Isolation Valve Division 4 | 30PED40AA021 | ESW Pump Structure Division 4 | Yes | Open |
| Makeup Water Check Valve Division 4 | 30PED40AA220 | ESW Pump Structure Division 4 | Yes | Close |
| <u>Dedicated</u> Isolation Valve Upstr KAA80AC001 | 30PEB80AA003 | ESW Dedicated Division Safeguard Building 4 | No | Open |
| <u>Dedicated</u> Isolation Valve Dnstr KAA80AC001 | 30PEB80AA004 | ESW Dedicated Division Safeguard Building 4 | Yes | Open |
| Dedicated ESW Pump | 30PEB80AP001 | ESW Pump Structure Division 4 | No | Run |
| <u>Dedicated Filter Blowdown Isolation Valve</u> Dedicated Blowdown Isolation Valve | 30PEB80AA009 | ESW Pump Structure Division 4 | No | Close |
| <u>Dedicated Blowdown Isolation Valve</u> Dedicated Filter Blowdown Isolation Valve | 30PEB80AA016 | ESW Pump Structure Division 4 | No | Close |
| Dedicated Recirc Isolation Valve | 30PEB80AA015 | ESW Pump Structure Division 4 | No | Close |

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Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (6 Sheets)

| Description | Tag Number ⁽¹⁾ | Location | ASME Code Section III | Function |
|---|---------------------------|--|-----------------------|------------------|
| Dedicated Filter Blowdown Isolation Check Valve | 30PEB80AA211 | ESW Pump Structure Division 4 | No | Close |
| Dedicated Pump Isolation Check Valve | 30PEB80AA002 | ESW Pump Structure Division 4 | No | Open |
| <u>Dedicated ESW Debris Filter</u> | <u>30PEB80AT001</u> | <u>ESW Pump Structure Division 4</u> | <u>No</u> | <u>Backwash</u> |
| <u>Cooling Tower Fan</u> | <u>30PED10AN001</u> | <u>ESW Cooling Tower Division 1</u> | <u>No</u> | <u>Run</u> |
| <u>Cooling Tower Fan</u> | <u>30PED10AN002</u> | <u>ESW Cooling Tower Division 1</u> | <u>No</u> | <u>Run</u> |
| <u>Cooling Tower Fan</u> | <u>30PED20AN001</u> | <u>ESW Cooling Tower Division 2</u> | <u>No</u> | <u>Run</u> |
| <u>Cooling Tower Fan</u> | <u>30PED20AN002</u> | <u>ESW Cooling Tower Division 2</u> | <u>No</u> | <u>Run</u> |
| <u>Cooling Tower Fan</u> | <u>30PED30AN001</u> | <u>ESW Cooling Tower Division 3</u> | <u>No</u> | <u>Run</u> |
| <u>Cooling Tower Fan</u> | <u>30PED30AN002</u> | <u>ESW Cooling Tower Division 3</u> | <u>No</u> | <u>Run</u> |
| <u>Cooling Tower Fan</u> | <u>30PED40AN001</u> | <u>ESW Cooling Tower Division 4</u> | <u>No</u> | <u>Run</u> |
| <u>Cooling Tower Fan</u> | <u>30PED40AN002</u> | <u>ESW Cooling Tower Division 4</u> | <u>No</u> | <u>Run</u> |
| Dedicated Emergency Blowdown Isolation Valve | 30PEB80AA003 | ESW Pump Structure Division 4 | No | Close |

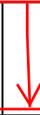
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1) Equipment tag numbers are provided for information only and are not part of the certified design.

**Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design
(6 Sheets)**

| Description | Tag Number ⁽¹⁾ | Location | IEEE Class 1E ⁽²⁾⁽³⁾ | PACS | MCR/RSS Displays |
|--|---------------------------|--|------------------------------------|------------|-----------------------|
| ESWS Pump Division 1 | 30PEB10AP001 | ESW Pump Structure Division 1 | Division 1 | Yes | On-Off/ On-Off |
| Recirc Isolation Valve Division 1 | 30PEB10AA002 | ESW Pump Structure Division 1 | Division 1 | Yes | Pos/N/A |
| Emer. Blowdown Isolation Valve Division 1 | 30PEB10AA003 | ESW Pump Structure Division 1 | Division 1 | Yes | Pos/N/A |
| Pump Discharge Isolation Valve Division 1 | 30PEB10AA005 | ESW Pump Structure Division 1 | Division 1 | Yes | Pos/Pos |
| Filter Blowdown Isolation Valve Division 1 | 30PEB10AA015 | ESW Pump Structure Division 1 | Division 1 | Yes | Pos/N/A |
| Blowdown Isolation Valve Division 1 | 30PEB10AA016 | ESW Pump Structure Division 1 | Division 1 | Yes | Pos/N/A |
| <u>ESW Debris Filter Division 1</u> | <u>30PEB10AT002</u> | <u>ESW Pump Structure Division 1</u> | <u>Division 1</u> | <u>Yes</u> | <u>On-Off/ On-Off</u> |
| Tower Isolation Valve Division 1 | 30PED10AA010 | ESW Pump Structure Division 1 | Division 1 | Yes | Pos/N/A |
| Tower Bypass Isolation Valve Division 1 | 30PED10AA011 | ESW Pump Structure Division 1 | Division 1 | Yes | Pos/N/A |
| Makeup Water Isolation Valve Division 1 | 30PED10AA019 | ESW Pump Structure Division 1 | Division 1 | Yes | Pos/N/A |

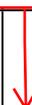
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**Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design
(6 Sheets)**

| Description | Tag Number ⁽¹⁾ | Location | IEEE Class 1E ⁽²⁾⁽³⁾ | PACS | MCR/RSS Displays |
|--|----------------------------------|--|--|-------------|-----------------------------|
| Emer. Makeup Water Isolation Valve Division 1 | 30PED10AA021 | ESW Pump Structure Division 1 | Division 1 | Yes | Pos/N/A |
| ESWS Pump Division 2 | 30PEB20AP001 | ESW Pump Structure Division 2 | Division 2 | Yes | On-Off/ On-Off |
| Recirc Isolation Valve Division 2 | 30PEB20AA002 | ESW Pump Structure Division 2 | Division 2 | Yes | Pos/N/A |
| Emer. Blowdown Isolation Valve Division 2 | 30PEB20AA003 | ESW Pump Structure Division 2 | Division 2 | Yes | Pos/N/A |
| Pump Discharge Isolation Valve Division 2 | 30PEB20AA005 | ESW Pump Structure Division 2 | Division 2 | Yes | Pos/Pos |
| Filter Blowdown Isolation Valve Division 2 | 30PEB20AA015 | ESW Pump Structure Division 2 | Division 2 | Yes | Pos/N/A |
| Blowdown Isolation Valve Division 2 | 30PEB20AA016 | ESW Pump Structure Division 2 | Division 2 | Yes | Pos/N/A |
| <u>ESW Debris Filter Division 2</u> | <u>30PEB20AT002</u> | <u>ESW Pump Structure Division 2</u> | <u>Division 2</u> | <u>Yes</u> | <u>On-Off/ On-Off</u> |
| Tower Isolation Valve Division 2 | 30PED20AA010 | ESW Pump Structure Division 2 | Division 2 | Yes | Pos/N/A |
| Tower Bypass Isolation Valve Division 2 | 30PED20AA011 | ESW Pump Structure Division 2 | Division 2 | Yes | Pos/N/A |

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**Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design
(6 Sheets)**

| Description | Tag Number ⁽¹⁾ | Location | IEEE Class 1E ⁽²⁾⁽³⁾ | PACS | MCR/RSS Displays |
|--|---------------------------|--|------------------------------------|------------|-----------------------|
| Makeup Water Isolation Valve Division 2 | 30PED20AA019 | ESW Pump Structure Division 2 | Division 2 | Yes | Pos/N/A |
| Emer. Makeup Water Isolation Valve Division 2 | 30PED20AA021 | ESW Pump Structure Division 2 | Division 2 | Yes | Pos/N/A |
| ESWS Pump Division 3 | 30PEB30AP001 | ESW Pump Structure Division 3 | Division 3 | Yes | On-Off/ On-Off |
| Recirc Isolation Valve Division 3 | 30PEB30AA002 | ESW Pump Structure Division 3 | Division 3 | Yes | Pos/N/A |
| Emer. Blowdown Isolation Valve Division 3 | 30PEB30AA003 | ESW Pump Structure Division 3 | Division 3 | Yes | Pos/N/A |
| Pump Discharge Isolation Valve Division 3 | 30PEB30AA005 | ESW Pump Structure Division 3 | Division 3 | Yes | Pos/Pos |
| Filter Blowdown Isolation Valve Division 3 | 30PEB30AA015 | ESW Pump Structure Division 3 | Division 3 | Yes | Pos/N/A |
| Blowdown Isolation Valve Division 3 | 30PEB30AA016 | ESW Pump Structure Division 3 | Division 3 | Yes | Pos/N/A |
| <u>ESW Debris Filter Division 3</u> | <u>30PEB30AT002</u> | <u>ESW Pump Structure Division 3</u> | <u>Division 3</u> | <u>Yes</u> | <u>On-Off/ On-Off</u> |
| Tower Isolation Valve Division 3 | 30PED30AA010 | ESW Pump Structure Division 3 | Division 3 | Yes | Pos/N/A |

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**Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design
(6 Sheets)**

| Description | Tag Number ⁽¹⁾ | Location | IEEE Class 1E ⁽²⁾⁽³⁾ | PACS | MCR/RSS Displays |
|--|---------------------------|--|------------------------------------|------------|---------------------------|
| <u>ESW Debris Filter Division 4</u> | <u>30PEB40AT002</u> | <u>ESW Pump Structure Division 4</u> | <u>Division 4</u> | <u>Yes</u> | <u>On-Off/ On-Off</u> |
| Tower Isolation Valve Division 4 | 30PED40AA010 | ESW Pump Structure Division 4 | Division 4 | Yes | Pos/N/A |
| Tower Bypass Isolation Valve Division 4 | 30PED40AA011 | ESW Pump Structure Division 4 | Division 4 | Yes | Pos/N/A |
| Makeup Water Isolation Valve Division 4 | 30PED40AA019 | ESW Pump Structure Division 4 | Division 4 | Yes | Pos/N/A |
| Emer. Makeup Water Isolation Valve Division 4 | 30PED40AA021 | ESW Pump Structure Division 4 | Division 4 | Yes | Pos/N/A |
| Dedicated ESW Pump | 30PEB80AP001 | ESW Pump Structure Division 4 | Division 4 | Yes | On-Off/ On-Off |
| <u>Dedicated Blowdown Isolation Valve</u> Dedicated Filter Blowdown Isolation Valve | 30PEB80AA009 | ESW Pump Structure Division 4 | Division 4 | Yes | Pos/N/A |
| <u>Dedicated Filter Blowdown Isolation Valve</u> Dedicated Blowdown Isolation Valve | 30PEB80AA016 | ESW Pump Structure Division 4 | Division 4 | Yes | Pos/N/A |
| Dedicated Recirc Isolation Valve | 30PEB80AA015 | ESW Pump Structure Division 4 | Division 4 | Yes | Pos/N/A |

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← 09.02.01-26

**Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design
(6 Sheets)**

| Description | Tag Number ⁽¹⁾ | Location | IEEE Class 1E ⁽²⁾⁽³⁾ | PACS | MCR/RSS Displays |
|---|---------------------------|--|------------------------------------|----------------|---------------------------|
| Dedicated Emergency Blowdown Isolation Valve | 30PEB80AA003 | ESW Pump Structure Division 4 | Division 4 | Yes | Pos/N/A |
| <u>Dedicated ESW Debris Filter</u> | <u>30PEB80AT001</u> | <u>ESW Pump Structure Division 4</u> | <u>Division 4</u> | <u>Yes</u> | <u>On-Off/ On-Off</u> |
| Cooling Tower Fan | 30PED10AN001 | ESW Cooling Tower, Division 1 | Division 1 | Yes | On-Off/ On-Off |
| Cooling Tower Fan | 30PED10AN002 | ESW Cooling Tower, Division 1 | Division 1 | Yes | On-Off/ On-Off |
| Cooling Tower Fan | 30PED20AN001 | ESW Cooling Tower, Division 2 | Division 2 | Yes | On-Off/ On-Off |
| Cooling Tower Fan | 30PED20AN002 | ESW Cooling Tower, Division 2 | Division 2 | Yes | On-Off/ On-Off |
| Cooling Tower Fan | 30PED30AN001 | ESW Cooling Tower, Division 3 | Division 3 | Yes | On-Off/ On-Off |
| Cooling Tower Fan | 30PED30AN002 | ESW Cooling Tower, Division 3 | Division 3 | Yes | On-Off/ On-Off |
| Cooling Tower Fan | 30PED40AN001 | ESW Cooling Tower, Division 4 | Division 4 | Yes | On-Off/ On-Off |
| Cooling Tower Fan | 30PED40AN002 | ESW Cooling Tower, Division 4 | Division 4 | Yes | On-Off/ On-Off |

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

2) ^N denotes the division the component is normally powered from; ^A denotes the division the component is powered from when a Class 1E feed is implemented.

3) “Dedicated” components are non-Class 1E components but are powered from the Class 1E Division as shown. ←

**Table 2.7.11-3—Essential Service Water System ITAAC
(6 Sheets)**

| Commitment Wording | | Inspections, Tests, Analyses | Acceptance Criteria |
|--------------------|---|---|--|
| 5.1 | The components designated as Class 1E in Table 2.7.11-2 are powered from the Class 1E division as listed in Table 2.7.11-2 in a normal or alternate feed condition. | <p>a. Testing will be performed for components designated as Class 1E in Table 2.7.11-2 by providing a test signal in each normally aligned division.</p> <p>b. Testing will be performed for components designated as Class 1E in Table 2.7.11-2 by providing a test signal in each division with the alternate feed aligned to the divisional pair.</p> | <p>a. The test signal provided in the normally aligned division is present at the respective Class 1E component identified in Table 2.7.11-2.</p> <p>b. The test signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E component identified in Table 2.7.11-2.</p> |
| 5.2 | Valves listed in Table 2.7.11-2 fail as-is on loss of power. | Testing will be performed for the valves listed in Table 2.7.11-2 to fail as-is on loss of power. | Following loss of power, the valves listed in Table 2.7.11-2 fail as-is. |
| 5.3 | Deleted. | Deleted. | Deleted. |
| 5.4 | <u>Items identified in Table 2.7.11-2 as “Dedicated” ESWS motor-operated components are capable of being supplied by a SBODG.</u> | <u>Testing will be performed for motor-operated components designated as “Dedicated” in Table 2.7.11-2 by providing a test signal with the SBODG.</u> | <u>The test signal provided by the SBODG is present at the respective “Dedicated” component identified in Table 2.7.11-2.</u> |
| 6.1 | Deleted. | Deleted. | Deleted. |
| 7.1 | <u>The ESWS UHS as listed in Table 2.7.11-1 has the capacity to remove the design heat load from the CCWS and EDG heat exchangers, and the ESWPBVS room cooler.</u> The ESWS UHS as listed in Table 2.7.11-1 has the capacity to remove the design heat load from the CCWS. | <u>Tests of the UHS and inspection of a heat exchanger/cooler data report</u> Tests and analyses will be performed to demonstrate the capability of the ESWS UHS as listed in Table 2.7.11-1 to remove the design heat load from CCWS and EDG heat exchangers and the ESWPBVS room cooler. | <u>A report exists and concludes that the ESWS UHS has the capacity to remove at least the total design heat load of 3.139+08 BTU/hr from the CCWS and EDG heat exchangers and the ESWPBVS room cooler.</u> of 2.913 E+08 BTU/hr. |

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**Table 2.7.11-3—Essential Service Water System ITAAC
(6 Sheets)**

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| | Commitment Wording | Inspections, Tests, Analyses | Acceptance Criteria |
|-----|---|--|---|
| 7.2 | The pumps listed in Table 2.7.11-1 have <u>sufficient</u> NPSHA that is greater than NPSHR at system run-out flow. | Testing <u>and analyses</u> will be performed to verify NPSHA for pumps listed in Table 2.7.11-1. | <u>A report exists and concludes that</u> The <u>the</u> pumps listed in Table 2.7.11-1 have NPSHA that is greater than NPSHR at <u>the maximum ESWS flow rate system run-out flow</u> with consideration for minimum allowable cooling tower basin water level (as corrected to account for actual temperature and atmospheric conditions). |
| 7.3 | Class 1E valves listed in Table 2.7.11-2 perform the function listed in Table 2.7.11-1 under system operating conditions. | Tests and analyses or a combination of tests and analyses will be performed to demonstrate the ability of the valves listed in Table 2.7.11-2 to change position as listed in Table 2.7.11-1 under system operating conditions. | The valve changes position as listed Table 2.7.11-1 under system operating conditions. |
| 7.4 | The ESWS has provisions to allow flow testing of the ESWS pumps during plant operation. | Testing for flow of the ESWS pumps back to the ESW cooling tower basin will be performed. | The closed loop allows ESWS pump flow back to the ESW cooling tower basin. |
| 7.5 | Deleted. | Deleted. | Deleted. |
| 7.6 | The ESWS delivers water to the CCWS and EDG heat exchangers and the ESWPBVS room coolers. | Tests and <u>inspection of a pump data report analyses</u> will be performed to verify the ESWS delivery rate <u>to the CCWS and EDG heat exchangers and the ESWPBVS room cooler</u> under <u>operating conditions.</u> | A report exists and concludes that the ESWS system delivers <u>a</u> the combined total flowrate of at least 19,340 gpm <u>to the CCWS and EDG heat exchangers and the ESWPBVS room cooler.</u> |

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Next File

Table 3.10-1—List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment (Sheet 88 of 195)

| 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) | | | |
|--|---------------------|--|-------------------------------|---|---------------------------------------|--------------------------|-------------|--|--|
| CK-V Rten Com 1B NC | 30KAB80AA020 | 31UJH10004 | M | H | ES SI | S | C/NM | | |
| V F KAB80 CF060 | 30KAB80AA314 | 31UJH10004 | M | H | ES SI | S | C/NM | | |
| V F KAB80 CF060 | 30KAB80AA315 | 31UJH10004 | M | H | ES SI | S | C/NM | | |
| V F KAB80 CF061 | 30KAB80AA316 | 31UJH10004 | M | H | ES SI | S | C/NM | | |
| V F KAB80 CF061 | 30KAB80AA317 | 31UJH10004 | M | H | ES SI | S | C/NM | | |
| D-V Sup Com1B NC | 30KAB80AA403 | 31UJH10004 | M | H | ES SI | S | C/NM | | |
| D-V Retn Com1B NC | 30KAB80AA406 | 31UJH10004 | M | H | ES SI | S | C/NM | | |
| D-V Retn Com1B NC | 30KAB80AA407 | 31UJH10004 | M | H | ES SI | S | C/NM | | |
| V-V Sup Com1B NC | 30KAB80AA501 | 31UJH10004 | M | H | ES SI | S | C/NM | | |
| V-V Retn Com1B NC | 30KAB80AA504 | 31UJH10004 | M | H | ES SI | S | C/NM | | |
| F Upstr QNA21 AC002 | 30KAB80CF060 | 31UJH10004 | M | H | SI | S | C/NM | | |
| F Dnstr KAB80 Chil | 30KAB80CF061 | 31UJH10004 | M | H | SI | S | C/NM | | |
| Essential Service Water System (ESWS) | | | | | | | | | |
| <u>ESW Debris Filter</u> | <u>30PEB10AT002</u> | <u>31UQB02001</u> | <u>M</u> | <u>M</u> | <u>ES SI</u> | <u>S</u> | <u>C/NM</u> | | |
| <u>ESW Debris Filter</u> | <u>30PEB20AT002</u> | <u>32UQB02001</u> | <u>M</u> | <u>M</u> | <u>ES SI</u> | <u>S</u> | <u>C/NM</u> | | |
| <u>ESW Debris Filter</u> | <u>30PEB30AT002</u> | <u>33UQB02001</u> | <u>M</u> | <u>M</u> | <u>ES SI</u> | <u>S</u> | <u>C/NM</u> | | |
| <u>ESW Debris Filter</u> | <u>30PEB40AT002</u> | <u>34UQB02001</u> | <u>M</u> | <u>M</u> | <u>ES SI</u> | <u>S</u> | <u>C/NM</u> | | |
| CCW HX Inlet Isolation Vlv | 30PEB10AA007 | 31UJH05026 | M | H | SI | S | C/NM | | |
| CCW HX Outlet Isolation Vlv | 30PEB10AA009 | 31UJH05026 | M | H | SI | S | C/NM | | |
| CCW HX Tube Side Thermal Relief Vlv | 30PEB10AA192 | 31UJH05026 | M | H | SI | S | C/NM | | |
| CCW HX Inlet Side DP Root Vlv | 30PEB10AA306 | 31UJH10026 | M | H | SI | S | C/NM | | |
| CCW HX Outlet Side DP Root Vlv | 30PEB10AA307 | 31UJH10026 | M | H | SI | S | C/NM | | |
| ESW Drain Isolation Vlv | 30PEB10AA401 | 31UJH01026 | M | H | SI | S | C/NM | | |
| ESW Drain Isolation Vlv | 30PEB10AA402 | 31UJH10026 | M | H | SI | S | C/NM | | |
| ESW Drain Isolation Vlv | 30PEB10AA403 | 31UJH01026 | M | H | SI | S | C/NM | | |
| ESW Drain Isolation Vlv | 30PEB10AA405 | 31UJH01026 | M | H | SI | S | C/NM | | |
| ESW Drain Isolation Vlv | 30PEB10AA407 | 31UJH01026 | M | H | SI | S | C/NM | | |
| ESW Drain Isolation Vlv | 30PEB10AA408 | 31UJH01026 | M | H | SI | S | C/NM | | |
| CCW HX Tube Side Vent Vlv | 30PEB10AA508 | 31UJH10026 | M | H | SI | S | C/NM | | |
| CCW HX Tube Side Vent Vlv | 30PEB10AA509 | 31UJH10026 | M | H | SI | S | C/NM | | |
| Orifice Plate | 30PEB10BP002 | 31UJH05026 | M | H | SI | S | C/NM | | |
| CCW HX DP Measurement | 30PEB10CP004 | 31UJH05026 | M | H | SI | S | C/NM | | |
| CCW HX Outlet Temp Measurement | 30PEB10CT002 | 31UJH05026 | M | H | SI | S | C/NM | | |

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Four ESWS divisions are normally running to achieve cold shutdown in the minimum time. Only two divisions are required to achieve cold shutdown.

During refueling, when the core is almost discharged to the Fuel Building (FB), two or three ESWS divisions are in operation. During this phase, maintenance can be performed on one division. When the core is totally offloaded and in the FB, only two ESWS divisions are required to be in operation.

Non-Safety-Related Division

The dedicated ESW division is not in use during normal plant operation. The ESW side of the dedicated CCWS HX is separated from the rest of the system. The ESW inlet and outlet isolation valves are closed and this section is filled with demineralized water to prevent corrosion. The rest of the system is filled with site specific ESW fluid.

The dedicated ESW cooling chain is activated in case of an SA. This requires closing the ESW isolation valve downstream of CCW HX #4, manually opening the dedicated ESW isolation valves upstream and downstream of the dedicated CCW HX, and manually starting the dedicated ESW pump.

Dedicated ESWS motor-operated components are capable of being supplied by a standby EDG or a station blackout diesel generator (SBODG) that is provided as an alternate ac power source.

9.2.1.4.2

Abnormal Operating Conditions

Non-LOCA Design Basis Event During Power Operation

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The ESWS operates as described for normal operating conditions, supplying the operating CCWS divisions as required.

Loss of Offsite Power

In case of loss of offsite power (LOOP), at least three of the safety-related ESWS divisions are available assuming one division is not available due to preventive maintenance. The four ESWS pumps belonging to the four safety-related divisions have power supplied by the EDGs.

In case of LOOP, the dedicated ESWS division is available but in standby condition. Power is supplied by the EDG. The dedicated ESWS division is also capable of being powered by the SBODGs so that the function is available even in case of LOOP with simultaneous loss of all EDGs.