ArevaEPRDCPEm Resource

From: WELLS Russell (AREVA) [Russell.Wells@areva.com]
Sent: Friday, April 15, 2011 7:24 AM
To: Tesfaye, Getachew
Cc: LENTZ Tony (EXTERNAL AREVA); BENNETT Kathy (AREVA); DELANO Karen (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 300, FSAR Ch. 16 OPEN ITEM, Supplement 10
Attachments: RAI 300 Supplement 10 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. provided responses to the four questions of RAI No. 300 on March 26, 2010. Supplement 1, Supplement 2, and Supplement 3 responses to RAI No. 300 were sent on May 3, 2010, June 15, 2010, and August 27, 2010, respectively, to provide a revised schedule. Supplement 4 response to RAI No. 300 was sent on October 07, 2010, to provide a partial response to 29 parts of the remaining four questions. Supplement 5, Supplement 6, and Supplement 7 responses to RAI No. 300 were sent on October 20, 2010, December 11, 2010, and January 26, 2011, respectively, to provide a revised schedule. Supplement 8 response to RAI No. 300 was sent on February 8, 2011, to provide a partial response to three of the remaining questions. Supplement 9 response to RAI No. 300 was sent on March 22, 2011 to provide a revised schedule.

The attached file, "RAI 300 Supplement 10 US EPR DC.pdf," provides a partial response to 3 of the 4 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 300 Questions 16-311 and 16-313.

The following table indicates the respective pages in the response document, "RAI 300 Supplement 10 US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 300 — 16-311, Part 16-145(a)	2	3
RAI 300 — 16-311, Part 16-145(c)	4	4
RAI 300 — 16-311, Part 16-145(d)	5	6
RAI 300 — 16-311, Part 16-149(a)	7	9
RAI 300 — 16-311, Part 16-149(b)	10	10
RAI 300 — 16-311, Part 16-166	11	11
RAI 300 — 16-311, Part 16-190(f)	12	12
RAI 300 — 16-311, Part 16-209	13	13
RAI 300 — 16-312, Part 16-213	14	16
RAI 300 — 16-313, Part 16-11	17	19
RAI 300 — 16-313, Part 16-23(a)	20	21
RAI 300 — 16-313, Part 16-29(b)	22	22
RAI 300 — 16-313, Part 16-53	23	25

The schedule for a technically correct and complete response to the remaining parts of the four questions remains unchanged and is provided below.

Question #	**Response Date**
RAI 300 — 16-311	April 26, 2011
RAI 300 — 16-312	April 26, 2011
RAI 300 — 16-313	April 26, 2011

RAI 300 — 16-315	April 26, 2011

Sincerely,

Russ Wells
U.S. EPR Design Certification Licensing Manager
AREVA NP, Inc.
3315 Old Forest Road, P.O. Box 10935
Mail Stop OF-57
Lynchburg, VA 24506-0935
Phone: 434-832-3884 (work)
434-942-6375 (cell)
Fax: 434-382-3884
Russell.Wells@Areva.com

From: WELLS Russell (RS/NB)
Sent: Tuesday, March 22, 2011 1:02 PM
To: Tesfaye, Getachew
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. 300, FSAR Ch. 16 OPEN ITEM, Supplement 9

Getachew,

AREVA NP Inc. provided responses to the four questions of RAI No. 300 on March 26, 2010. Supplement 1, Supplement 2, and Supplement 3 responses to RAI No. 300 were sent on May 3, 2010, June 15, 2010, and August 27, 2010, respectively, to provide a revised schedule. Supplement 4 response to RAI No. 300 was sent on October 07, 2010, to provide a partial response to 29 parts of the remaining four questions. Supplement 5 response to RAI No. 300 was sent on October 20, 2010, to provide a revised schedule. Supplement 6 response to RAI No. 300 was sent on December 11, 2010, to provide a revised schedule. Supplement 7 response to RAI No. 300 was sent on January 26, 2011, to provide a revised schedule. Supplement 8 response to RAI No. 300 was sent on February 8, 2011, to provide a partial response to three of the remaining questions.

A revised schedule is provided below to allow additional time to address comments and have additional interaction with the staff on the remaining parts of the four questions.

A complete answer is not provided for the remaining 4 questions. The schedule for a technically correct and complete response to these questions is changed and is provided below.

Question #	Response Date
RAI 300 - 16 — 311	April 26, 2011
RAI 300 - 16 — 312	April 26, 2011
RAI 300 - 16 — 313	April 26, 2011
RAI 300 - 16 — 315	April 26, 2011

Sincerely,

Russ Wells
U.S. EPR Design Certification Licensing Manager

AREVA NP, Inc.
3315 Old Forest Road, P.O. Box 10935
Mail Stop OF-57
Lynchburg, VA 24506-0935
Phone: 434-832-3884 (work)
434-942-6375 (cell)
Fax: 434-382-3884
Russell.Wells@Areva.com

From: BRYAN Martin (External RS/NB)
Sent: Tuesday, February 08, 2011 3:22 PM
To: Tesfaye, Getachew
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); RYAN Tom (RS/NB); LENTZ Tony (External RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 300, FSAR Ch. 16 OPEN ITEM, Supplement 8

Getachew,

AREVA NP Inc. provided responses to the four questions of RAI No. 300 on March 26, 2010. Supplement 1, Supplement 2, and Supplement 3 responses to RAI No. 300 were sent on May 3, 2010, June 15, 2010, and August 27, 2010, respectively, to provide a revised schedule. Supplement 4 response to RAI No. 300 was sent on October 07, 2010, to provide a partial response to 29 parts of the remaining four questions. Supplement 5, Supplement 6, and Supplement 7 responses to RAI No. 300 were sent on October 20, 2010, December 11, 2010, and January 26, 2011, respectively, to provide a revised schedule.

The attached file, "RAI 300 Supplement 8 US EPR DC.pdf," provides a partial response.

The following table indicates the respective pages in the response document, "RAI 300 Supplement 8 US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 300 — 16-311, Part 16-129(c)	3	3
RAI 300 — 16-311, Part 16-131(a)	4	4
RAI 300 — 16-311, Part 16-131(b)	5	5
RAI 300 — 16-311, Part 16-131(c)	6	6
RAI 300 — 16-311, Part 16-141(a)	7	7
RAI 300 — 16-311, Part 16-145(b)	8	8
RAI 300 — 16-311, Part 16-147(a)	9	9
RAI 300 — 16-311, Part 16-149(a)	10	12
RAI 300 — 16-311, Part 16-150(b)	13	13
RAI 300 — 16-311, Part 16-150(c)	14	14
RAI 300 — 16-311, Part 16-151	15	15
RAI 300 — 16-311, Part 16-154	16	17
RAI 300 — 16-311, Part 16-162(a)	18	18
RAI 300 — 16-311, Part 16-162(b)	19	19
RAI 300 — 16-311, Part 16-167	20	20
RAI 300 — 16-311, Part 16-169(b)	21	21
RAI 300 — 16-311, Part 16-174(a)	22	22

Question #	Start Page	End Page
RAI 300 — 16-311, Part 16-180(b)	23	23
RAI 300 — 16-311, Part 16-182(a)	24	24
RAI 300 — 16-311, Part 16-182(c)	25	25
RAI 300 — 16-311, Part 16-190(a)	26	26
RAI 300 — 16-311, Part 16-190(b)	27	27
RAI 300 — 16-311, Part 16-190(d)	28	28
RAI 300 — 16-311, Part 16-190(e)	29	29
RAI 300 — 16-311, Part 16-190(f)	30	30
RAI 300 — 16-311, Part 16-190(g)	31	31
RAI 300 — 16-311, Part 16-193(c)	32	32
RAI 300 — 16-311, Part 16-204	33	36
RAI 300 — 16-311, Part 16-205	37	39
RAI 300 — 16-311, Part 16-208	40	40
RAI 300 — 16-311, Part 16-209	41	42
RAI 300 — 16-312, Part 16-212(a)	43	44
RAI 300 — 16-312, Part 16-212(b)	45	45
RAI 300 — 16-312, Part 16-217(b)	46	46
RAI 300 — 16-312, Part 16-217(c)	47	47
RAI 300 — 16-312, Part 16-217(d)	48	48
RAI 300 — 16-312, Part 16-219	49	49
RAI 300 — 16-312, Part 16-226	50	50
RAI 300 — 16-312, Part 16-227	51	52
RAI 300 — 16-312, Part 16-234(b)	53	54
RAI 300 — 16-313, Part 16-23(b)	55	55
RAI 300 — 16-313, Part 16-27	56	56
RAI 300 — 16-313, Part 16-33	57	57
RAI 300 — 16-313, Part 16-36	58	58
RAI 300 — 16-313, Part 16-39	59	59
RAI 300 — 16-313, Part 16-40(a)	60	60
RAI 300 — 16-313, Part 16-40(b)	61	61
RAI 300 — 16-313, Part 16-42	62	62
RAI 300 — 16-313, Part 16-43	63	63
RAI 300 — 16-313, Part 16-49(a)	64	64

The schedule for a technically correct and complete response to the remaining parts of the four questions remains unchanged and will be provided by March 24, 2011.

Sincerely,

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

From: BRYAN Martin (External RS/NB)
Sent: Wednesday, January 26, 2011 3:13 PM

To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 300, FSAR Ch. 16 OPEN ITEM, Supplement 7

Getachew,

AREVA NP Inc. provided responses to the four questions of RAI No. 300 on March 26, 2010. Supplement 1, Supplement 2, and Supplement 3 responses to RAI No. 300 were sent on May 3, 2010, June 15, 2010, and August 27, 2010, respectively, to provide a revised schedule. Supplement 4 response to RAI No. 300 was sent on October 07, 2010, to provide a partial response to 29 parts of the remaining four questions. Supplement 5 response to RAI No. 300 was sent on October 20, 2010, to provide a revised schedule. Supplement 6 response to RAI No. 300 was sent on December 11, 2010, to provide a revised schedule.

A revised schedule is provided below to allow additional time to address comments and have additional interaction with the staff on the remaining parts of the four questions.

A complete answer is not provided for the remaining 4 questions. The schedule for a technically correct and complete response to these questions is changed and is provided below.

Question #	Response Date
RAI 300 - 16 — 311	March 24, 2011
RAI 300 - 16 — 312	March 24, 2011
RAI 300 - 16 — 313	March 24, 2011
RAI 300 - 16 — 315	March 24, 2011

Sincerely,

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

From: BRYAN Martin (External RS/NB)
Sent: Saturday, December 11, 2010 9:13 PM
To: Tesfaye, Getachew
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 300, FSAR Ch. 16 OPEN ITEM, Supplement 6

Getachew,

AREVA NP Inc. provided responses to the four questions of RAI No. 300 on March 26, 2010. Supplement 1, Supplement 2, and Supplement 3 responses to RAI No. 300 were sent on May 3, 2010, June 15, 2010, and August 27, 2010, respectively, to provide a revised schedule. Supplement 4 response to RAI No. 300 was sent on October 07, 2010, to provide a partial response to 29 parts of

the remaining four questions. Supplement 5 response to RAI No. 300 was sent on October 20, 2010, to provide a revised schedule.

A revised schedule is provided below to allow additional time to address comments and have additional interaction with the staff on the remaining parts of the four questions.

Note that question 16-314 was shown as still outstanding in Supplement 4 and Supplement 5, but the responses sent in Supplement 4 completed the response to question 16-314, so it has been removed from the schedule below. Also note that the response to question 16-315 was not complete as reported in the initial response , so question 16-315 has been added back to the schedule below.

A complete answer is not provided for the remaining 4 questions. The schedule for a technically correct and complete response to these questions is changed and is provided below.

Question #	Response Date
RAI 16 — 311	January 27, 2011
RAI 16 — 312	January 27, 2011
RAI 16 — 313	January 27, 2011
RAI 16 — 315	January 27, 2011

Sincerely,

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

From: BRYAN Martin (External RS/NB)
Sent: Wednesday, October 20, 2010 3:30 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 300, FSAR Ch. 16 OPEN ITEM, Supplement 5

Getachew,

AREVA NP Inc. provided responses to the four questions of RAI No. 300 on March 26, 2010. Supplement 1, Supplement 2, and Supplement 3 responses to RAI No. 300 were sent on May 3, 2010, June 15, 2010, and August 27, 2010, respectively, to provide a revised schedule. Supplement 4 response to RAI No. 300 was sent on October 07, 2010, to provide a partial response to 29 parts of the remaining four questions.

A revised schedule is provided below to allow additional time to address comments and have additional interaction with the staff on the remaining parts of the four questions.

A complete answer is not provided for the remaining 4 questions. The schedule for a technically correct and complete response to these questions is changed and is provided below.

Question #	Response Date
RAI 16 — 311	December 16, 2010
RAI 16 — 312	December 16, 2010
RAI 16 — 313	December 16, 2010
RAI 16 — 314	December 16, 2010

Sincerely,

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

From: BRYAN Martin (External RS/NB)
Sent: Thursday, October 07, 2010 10:55 AM
To: Tesfaye, Getachew
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); LENTZ Tony (External RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 300, FSAR Ch. 16 OPEN ITEM, Supplement 4

Getachew,

AREVA NP Inc. provided responses to the four questions of RAI No. 300 on March 26, 2010. Supplement 1, Supplement 2, and Supplement 3 responses to RAI No. 300 were sent on May 3, 2010, June 15, 2010, and August 27, 2010, respectively, to provide a revised schedule.

The attached file, "RAI 300 Supplement 4 US EPR DC.pdf," provides a partial response.

The following table indicates the respective pages in the response document, "RAI 300 Supplement 4 US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 300 — 16-311, Part 16-129(b)	3	3
RAI 300 — 16-311, Part 16-130	4	4
RAI 300 — 16-311, Part 16-138(b)	5	5
RAI 300 — 16-311, Part 16-138(c)	6	6
RAI 300 — 16-311, Part 16-141(b)	7	7
RAI 300 — 16-311, Part 16-144	8	8
RAI 300 — 16-311, Part 16-147(b)	9	9
RAI 300 — 16-311, Part 16-147(c)	10	10
RAI 300 — 16-311, Part 16-147(d)	11	11
RAI 300 — 16-311, Part 16-147(e)	12	12
RAI 300 — 16-311, Part 16-150(d)	13	13
RAI 300 — 16-311, Part 16-162(c)	14	14
RAI 300 — 16-311, Part 16-169(a)	15	15
RAI 300 — 16-311, Part 16-174(b)	16	16
RAI 300 — 16-311, Part 16-185	17	17
RAI 300 — 16-311, Part 16-190(h)	18	18

RAI 300 — 16-311, Part 16-191(a)	19	19
RAI 300 — 16-311, Part 16-191(b)	20	20
RAI 300 — 16-311, Part 16-200	21	21
RAI 300 — 16-311, Part 16-207	22	23
RAI 300 — 16-312, Part 16-217(a)	25	25
RAI 300 — 16-312, Part 16-217(e)	26	26
RAI 300 — 16-312, Part 16-223	27	27
RAI 300 — 16-313, Part 16-18	29	29
RAI 300 — 16-313, Part 16-29(a)	30	30
RAI 300 — 16-313, Part 16-46	31	31
RAI 300 — 16-313, Part 16-49(b)	32	32
RAI 300 — 16-314, Part 16-237(a)	34	34
RAI 300 — 16-314, Part 16-237(b)	35	35

The schedule for a technically correct and complete response to the remaining parts of the four questions remains unchanged and will be provided on October 21, 2010.

Sincerely,

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

From: BRYAN Martin (External RS/NB)
Sent: Friday, August 27, 2010 12:00 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 300, FSAR Ch. 16 OPEN ITEM, Supplement 3

Getachew,

AREVA NP provided technically correct and complete responses to 2 of the 6 questions on March 26, 2010. In a meeting with the NRC on April 27-28, 2010, it was agreed that further interactions should take place prior to formal submittal of the remaining 4 RAI responses. AREVA provided an updated schedule for the remaining 4 responses on May 3, 2010. AREVA provided an updated schedule for the remaining 4 responses on June 15, 2010 to allow for additional interaction with the NRC.

A revised schedule is provided below to allow additional time to address comments and have additional interaction with the staff on the four remaining questions.

A complete answer is not provided for the remaining 4 questions. The schedule for a technically correct and complete response to these questions is changed and is provided below.

Question #	Response Date
RAI 16 — 311	October 21, 2010
RAI 16 — 312	October 21, 2010
RAI 16 — 313	October 21, 2010

RAI 16 — 314	October 21, 2010

Sincerely,

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

From: BRYAN Martin (EXT)
Sent: Tuesday, June 15, 2010 2:32 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); RYAN Tom (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 300, FSAR Ch. 16 OPEN ITEM, Supplement 2

Getachew,

AREVA NP provided technically correct and complete responses to 2 of the 6 questions on March 26, 2010. In a meeting with the NRC on April 27-28, 2010, it was agreed that further interactions should take place prior to formal submittal of the remaining 4 RAI responses. AREVA provided an updated schedule for the remaining 4 responses on May 3, 2010.

Based on the stated availability of the NRC staff, as well as preparation time for their input to these interactions, AREVA is providing a revised schedule below.

A complete answer is not provided for the remaining 4 questions. The schedule for a technically correct and complete response to these questions is changed and is provided below.

Question #	Response Date
RAI 16 — 311	August 31, 2010
RAI 16 — 312	August 31, 2010
RAI 16 — 313	August 31, 2010
RAI 16 — 314	August 31, 2010

Sincerely,

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

From: BRYAN Martin (EXT)
Sent: Monday, May 03, 2010 5:55 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); PANNELL George L (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 300, FSAR Ch. 16 OPEN ITEM, Supplement 1

Getachew,

AREVA NP provided technically correct and complete responses to 2 of the 6 questions on March 26, 2010. In a meeting with the NRC on April 27-28, 2010, it was agreed that further interactions should take place prior to formal submittal of the remaining 4 RAI responses. Based on the stated availability of the NRC staff, as well as preparation time for their input to these interactions, AREVA is providing a revised schedule below.

A complete answer is not provided for the remaining 4 questions. The schedule for a technically correct and complete response to these questions is changed and is provided below.

Question #	Response Date
RAI 16 — 311	June 24, 2010
RAI 16 — 312	June 24, 2010
RAI 16 — 313	June 24, 2010
RAI 16 — 314	June 24, 2010

Sincerely,

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

From: BRYAN Martin (EXT)
Sent: Friday, March 26, 2010 5:39 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen V (AREVA NP INC); ROMINE Judy (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); PANNELL George L (AREVA NP INC); WILLIFORD Dennis C (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 300, FSAR Ch. 16 OPEN ITEM

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information RAI 300. The attached file, "RAI 300 Response US EPR DC.pdf" provides technically correct and complete responses to 2 of the 6 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 16-310.

The following table indicates the respective pages in the response document, "RAI 300 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 16 — 310	2	3
RAI 16 — 311	4	9
RAI 16 — 312	10	11
RAI 16 — 313	12	16
RAI 16 — 314	17	17
RAI 16 — 315	18	23

A complete answer is not provided for 4 of the 6 questions. The schedule for a technically correct and complete response to these questions is provided below.

Question #	Response Date
RAI 16 — 311	May 3, 2010
RAI 16 — 312	May 3, 2010
RAI 16 — 313	May 3, 2010
RAI 16 — 314	May 3, 2010

Sincerely,

Martin (Marty) C. Bryan
Licensing Advisory Engineer
AREVA NP Inc.
Tel: (434) 832-3016
Martin.Bryan.ext@areva.com

From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Thursday, November 19, 2009 5:49 PM
To: ZZ-DL-A-USEPR-DL
Cc: Le, Hien; DeMarshall, Joseph; Kowal, Mark; Hearn, Peter; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 300 (3730,3742),FSAR Ch. 16 OPEN ITEM

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on September 23, 2009, and discussed with your staff on November 18, 2009. Draft RAI Question 16-311 was revised as a result of that discussion to request a revised response to RAI 16-199. The questions in this RAI are OPEN ITEMs in the safety evaluation report for Chapter 16 for Phases 2 and 3 reviews. As such, the schedule we have established for your application assumes technically correct and complete responses prior to the start of Phase 4 review. For any RAI that cannot be answered prior to the start of Phase 4 review, it is expected that a date for receipt of this information will be provided so that the staff can assess how this information will impact the published schedule.

Thanks,

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

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 2850

Mail Envelope Properties (1F1CC1BBDC66B842A46CAC03D6B1CD41043A8235)

Subject: Response to U.S. EPR Design Certification Application RAI No. 300, FSAR Ch. 16 OPEN ITEM, Supplement 10
Sent Date: 4/15/2011 7:24:23 AM
Received Date: 4/15/2011 7:24:27 AM
From: WELLS Russell (AREVA)

Created By: Russell.Wells@areva.com

Recipients:
"LENTZ Tony (EXTERNAL AREVA)" <Tony.Lentz.ext@areva.com>
Tracking Status: None
"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: AUSLYNCMX02.adom.ad.corp

Files	**Size**	**Date & Time**
MESSAGE	24613	4/15/2011 7:24:27 AM
RAI 300 Supplement 10 Response US EPR DC.pdf	205643	

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

Response to

Request for Additional Information No. 300 (3730, 3742), Supplement 10

11/19/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 16 - Technical Specifications
Application Section: FSAR Chapter 16

QUESTIONS for Technical Specification Branch (CTSB)

Question 16-311:

Potential Open Item

Provide the additional information and update the following RAI responses for each of the Instrumentation System Tech Spec items identified, based on the results of Audit Meetings between AREVA NP and NRC Staff on 7/30/09, 7/31/09, 8/13/09 and 8/14/09.

Request for Additional Information No. 103 (1270)

Question 16-311

Followup to Question 16-145:

a)Extraneous information regarding Operability included in Permissive P6 Bases discussion.

Response to Question 16-145(a):

This issue was further clarified on Page 16-22 of the NRC's March 10, 2010 Safety Evaluation, which states:

> The P6 Permissive Bases discussion on Page B 3.3.1-62 of the FSAR markup provided with the June 30, 2009, response (last paragraph), contains superfluous information pertaining to operability as it relates to 10 CFR 50.36, Criterion 3.

U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications Bases were revised in U.S. EPR FSAR, Revision 2 to delete the phrase "not required to be OPERABLE" in the Bases discussion of P6 permissive and P13 permissive.

The Bases Applicable Safety Analyses, LCO, and Applicability section and the description of P6 permissive and P13 permissive will be clarified to state that permissives that disable a reactor trip or ESF function when the permissives are validated are not part of a primary success path of a safety sequence analysis.

FSAR Impact:

U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications Bases will be revised as described in the response and indicated on the enclosed markup.

Question 16-311

Followup to Question 16-145:

c)Apparent omission of RCP Current sensors in Permissive P16 Bases.

Response to Question 16-145(c):

This issue was further clarified on Page 16-23 of the NRC's March 10, 2010 Safety Evaluation, which states:

> The P16 Permissive Bases discussion on Page B 3.3.1-67 of the FSAR markup provided with the June 30, 2009, response (last paragraph), does not include the RCP Current sensors.

A design change is being incorporated which eliminates the use of the RCP current sensors in the Protection System design. The changes to the Technical Specifications and Bases are described as part of the response to Question 16-311, Part 16-190(c).

FSAR Impact:

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

Question 16-311

Followup to Question 16-145:

d)Explanation regarding Intermediate Range sensor mode applicability. Applicable modes specified for the Intermediate Range sensors in Table 3.3.1-1 and the Bases are 1, 2, and 3 with the Reactor Control, Surveillance and Limitation (RCSL) System capable of withdrawing an RCCA or one or more RCCA's not fully inserted. Mode 1 applicability for Intermediate Range sensors is typically ≤ 10% RTP.

Response to Question 16-145(d):

This issue was further clarified on Pages 16-22 and 16-23 of the NRC's March 10, 2010 Safety Evaluation, which states:

> In RAI 103, Question 16-145, the staff requested that the applicant provide an explanation regarding the mode applicability for P6 Permissive instrumentation with respect to Reactor Trip Function A.8, High-Neutron Flux - Intermediate Range, as well as validation of the ≤15 percent rated thermal power (RTP) Limiting Trip Setpoint value. In a June 30, 2009, response to RAI 103, Question 16-145, the applicant sufficiently described how the mode requirements for the P6 Permissive sensors were chosen to envelope the required modes of the functions and permissives they support. However, there was no discussion pertaining to the LTSP for A.8. In an audit on August 13-14, 2009, the applicant explained that, because P6 Permissive validation is manual, the ≤15 percent RTP LTSP would remain active above the 10 percent RTP operability requirement specified in FSAR Tier 2, Table 3.3.1-2, until the permissive was manually validated by the operator. The staff agreed with the clarification provided during the audit. The RAI response needs to be updated with this information in order to ensure its completeness and accuracy.
>
> The applicable modes specified for the Intermediate Range sensors (A.13) in LCO Table 3.3.1-1 of the FSAR markup provided with the June 30, 2009, response and the associated Bases, are 1, 2, and 3 with the RCSL system capable of withdrawing an RCCA or one or more RCCA's not fully inserted. The staff questioned the Mode 1 applicability requirement on the basis that Intermediate Range sensor operability typically only extends up to 10 or 15 percent RTP. The Mode 1 requirement appears to be due to the fact that these sensors support Permissive P5 as well, which is utilized in both the High-Core Power Level and the Low Saturation Margin Reactor Trip functions. Permissive P5, Flux (Intermediate Range) Measurement Higher than Threshold, is representative of Intermediate Range Detector neutron flux measurements above a low-power setpoint value (approximately 10^{-5} percent) which corresponds to the boundary between the operating ranges of the Source Range and Intermediate Range detectors.

Mode requirements for sensors have been chosen to envelope the required modes of the functions and permissives they support.

The Intermediate Range sensors provide input to multiple functions, including:

1. The High Neutron Flux (Intermediate Range) reactor trip function. This function is assumed in the safety analysis to be operable in Modes 1 with RTP less than or equal to 10 percent, in Mode 2, and in Mode 3 when the Reactor Control, Surveillance and Limitation (RCSL) System is capable of withdrawing a RCCA or one or more RCCAs not fully inserted.

2. The Low Doubling Time (Intermediate Range) reactor trip function. This function is also assumed in the safety analysis to be operable in Mode 1 with RTP less than or equal to 10 percent, in Mode 2, and in Mode 3 when the RCSL System is capable of withdrawing an RCCA or one or more RCCAs not fully inserted.
3. P5 permissive. As discussed in the Response to RAI 103, Question 16-138, P5 permissive is required to be operable in Mode 1 and in Mode 2 above 10^{-5} RTP.

Therefore, the Intermediate Range sensors are required to be operable in Modes 1 and 2, and in Mode 3 when the RCSL System is capable of withdrawing a RCCA or one or more RCCAs are not fully inserted.

Inhibiting the P6 permissive enables the High Neutron Flux (Intermediate Range) and Low Doubling Time reactor trips when the power level is less than or equal to approximately 10 percent RTP. When nuclear power is above this threshold, these trips are disabled by validating P6 permissive. To validate P6 permissive, not only does the calculated core power level have to be greater than the threshold value, but the operator has to manually validate the permissive. Because the P6 permissive validation is manual, the 25 percent RTP NTSP would remain active above the 10 percent RTP operability requirement specified in U.S. EPR FSAR Tier 2, LCO Table 3.3.1-2, until the permissive was manually validated by the operator. U.S. EPR FSAR Tier 2 Chapter 16 Technical Specification were revised in U.S. EPR FSAR Revision 2 to implement a design change that revised the setpoint for the High Neutron Flux (Intermediate Range) reactor trip from 15 percent RTP to 25 percent RTP.

As discussed in U.S. EPR FSAR Tier 2 Section 7.1.1.5.3, four Intermediate Range sensors monitor more than seven decades up to at least 60 percent RTP. The sensors remain operable and are not disabled above the 60 percent RTP. Accuracy above this power level is not an operability concern since the permissive does not change state based on the accuracy of the input from the sensor. Therefore, the Intermediate Range sensors are adequate to support P5 and P6 permissives above the range where they provide input to the reactor trip functions.

FSAR Impact:

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

Question 16-311

Followup to Question 16-149:

a) Table 3.3.1-2 mode applicability footnotes for Functions B.3.c, B.11.b and B.11.c.

Response to Question 16-149(a)

This issue was further clarified on Page 16-25 of the NRC's March 10, 2010 Safety Evaluation, which states:

> However, the staff noted that the footnote assignments corresponding to the applicable modes for Sensor A.23 in LCO Table 3.3.1-1 and Function B.3.c in LCO Table 3.3.1-2 were questionable on the basis that (1) Permissive P15 may not be validated (i.e., RCP in operation) below Mode 4, and (2) footnotes have been specified for each applicable mode associated with Functions B.11.b, B.11.c, and Permissives P7, P8 in LCO Table 3.3.1-2 with respect to the operational status of RCPs (P7 either validated or inhibited). In addition, the staff noted that the assignment of Footnote (s) in Mode 6 for Function B.11.b and Permissive P7 was also questionable because of applicant information that RCPs would not be running in Mode 6.

With regard to the staff's first concern in the Safety Evaluation regarding P15 permissive, Sensor A.23, Reactor Coolant System (RCS) Loop Level, is only required to support the Safety Injection System (SIS) Actuation on Low RCS Loop Level function in Mode 4, 5, and 6 with P15 permissive validated. P15 permissive allows the automatic SIS actuation to switch between the Low RCS Loop Level and Low Delta Psat function in Mode 4 (Refer to U.S. EPR FSAR Tier 2, Figures 7.3-2, "SIS Actuation," and 7.2-34, "P15 Permissive Logic").

The following summarizes the use of Reactor Coolant Pumps (RCPs) during plant shutdown and startup operation. RCP pumps are normally run during the Cooldown from Mode 3 to Mode 4 using the four operating RCP to maximize SG heat transfer and to provide adequate cooling of the RCS Pressure Vessel Closure Head. The RCS must remain above 370 psia for continued RCP operation. During the cooldown from Mode 4 to Mode 5, when the RCS temperature is reduced to less than ≈250°F by automatic cooling via the SGs, two trains of Residual Heat Removal (RHR) are lined-up to the RCS and the associated Low Head Safety Injection (LHSI) pumps are manually started. When the LHSI/RHR trains are placed into service, the RCS heat rejection to the secondary side (via SGs) is no longer essential. Correspondingly, the forced flow of all four RCPs is not essential, thus two RCPs are secured to reduce the heat input to the RCS and reduce the time to cooldown to refueling temperatures. During the cooldown from Mode 4 to Mode 5, when the RCS temperature has decreased to approximately 160°F, a third RCP is manually removed from service. The final RCP is secured after the RCS has been cooled to approximately 130°F; the Pressurizer is less than approximately 160°F, and RCS fluid chemistry within limits. RCPs are not typically placed in service again until the unit is ready for start-up. To start-up, air is evacuated from the RCS. If not previously placed into service after the reactor cavity was refilled, both Chemical and Volume Control System (CVCS) charging pumps are started to provide RCP seal injection and are used for filling of the RCS after it is evacuated. The RCS is also filled through the RCP seal packages by the CVCS. To support RCP operation, the Pressurizer is heated using the Pressurizer heaters to establish a steam bubble in the Pressurizer and raise RCS pressure. The minimum RCS pressure for continued RCP operation is 370 psia. At that point, the RCPs are started to commence RCS heat-up.

The Protection System Technical Specifications are written to address the requirements of 10 CFR 50.36, Criterion 3:

> A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a Design Basis Accident or Transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier:

As stated in the NRC Policy Statement on Technical Specification Improvements for Nuclear Power Plants:

> A third concept in the adequate protection of the public health and safety is that in the event that a postulated Design Basis Accident or Transient should occur, structures, systems, sand components are available to function or to actuate in order to mitigate the consequence of the Design Basis Accident or Transient. Safety sequence analyses or their equivalent have been performed in recent years and provide a method of presenting the plant response to an accident. These can be used to define the primary success paths.
>
> A safety sequence analysis is a systematic examination of the actions required to mitigate the consequences of events considered in the plant's Design Basis Accident and Transient analyses, as presented in Chapters 6 and 15 of the plant's FSAR (or equivalent chapters). Such a safety sequence analysis considers all applicable events, whether explicitly or implicitly presented. The primary success path of a safety sequence analysis consists of the combination and sequences of equipment needed to operate (including consideration of the single failure criteria), so that the plant response to Design Basis Accidents and Transients limits the consequences of these events to within the appropriate acceptance criteria.
>
> It is the intent of this criterion to capture into Technical Specifications only those structures, systems, and components that are part of the primary success path of a safety sequence analysis.

It should also be noted, as stated in NUREG-1431, which provides the Standard Technical Specifications for Westinghouse plants:

> The shutdown Technical Specification requirements are designed to ensure that the unit has the capability to mitigate the consequences of certain postulated accidents. Worst case DBAs which are analyzed for operating MODES are generally viewed not to be a significant concern during shutdown MODES due to the lower energies involved. The Technical Specifications therefore require a lesser complement of electrical equipment to be available during shutdown than is required during operating MODES. More recent work completed on the potential risks associated with shutdown, however, have found significant risk associated with certain shutdown evolutions. As a result, in addition to the requirements established in the Technical Specifications, the industry has adopted NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management," as an Industry initiative to manage shutdown tasks and associated electrical support to maintain risk at an acceptable low level. This may require the availability of additional equipment beyond that required by the shutdown Technical Specifications.

Therefore, the Technical Specifications must verify the configuration of the Protection System is sufficient to bound the operational constraints assumed in the safety analysis. Additional administrative controls and equipment may be necessary to manage and perform shutdown tasks.

In Mode 4, when the RCPs are running, the SIS Actuation on Low Delta Psat function mitigates the postulated accidents or Anticipated Operational Occurrences (AOOs), including the small break and large break Loss of Coolant Accidents (LOCAs). As stated in the Protection System Bases, the SIS Actuation on Low RCS Loop Level function mitigates the following postulated accidents or AOOs:

- Loss of RHR during mid-loop operations,
- Uncontrolled loss of RCS inventory,
- Small break LOCA, and
- Large break LOCA.

The automatic SIS Actuation on Low RCS Loop Level function is required to be OPERABLE in:

- Mode 4 when no RCPs are running, the hot leg pressure is less than approximately 464 psia, and the hot leg temperature is less than approximately 350ºF, and
- Modes 5 and 6.

The Protection System architecture supports the plant response assumed in the safety analysis. The Technical Specifications reflect the Protection System design, embody the operation assumptions contained in the safety analysis, and satisfy Criterion 3 of 10 CFR 50.36.

With regard to the staff's second concern in the Safety Evaluation regarding the footnotes for ESF functions B.3.c, B.11b, and B.11.c in U.S. EPR FSAR Tier 2, Chapter 16, LCO Table 3.3.1-2 were reviewed to determine if they were consistent with regards to reflecting the requirements for RCPs running. The applicable footnote for Function B.11.b in Mode 6 will be added, the appropriate Bases description updated, and this correction will also reflected in Bases Table B 3.3.1-1.

FSAR Impact:

U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications and Bases will be revised as described in the response and indicated on the enclosed markup.

Question 16-311

Followup to Question 16-149:

b)Table 3.3.1-1 mode applicability footnotes for Sensor A.23.

Response to Question 16-149(b):

This issue was further clarified on Page 16-25 of the NRC's March 10, 2010 Safety Evaluation, which states:

> In RAI 103, Question 16-149, the staff requested that the applicant provide a technical justification regarding omission of the SIS Actuation Signal on RCS Loop Low Level function from LCO 3.3.1, Protection System. In a June 30, 2009, response to RAI 103, Question 16-149, the applicant stated that the SIS Actuation on RCS Loop Low Level function and its associated sensor (RCS Loop Level) would be included in LCO 3.3.1 and the Bases. However, the staff noted that the footnote assignments corresponding to the applicable modes for Sensor A.23 in LCO Table 3.3.1-1 and Function B.3.c in LCO Table 3.3.1-2 were questionable on the basis that (1) Permissive P15 may not be validated (i.e., RCP in operation) below Mode 4, and (2) footnotes have been specified for each applicable mode associated with Functions B.11.b, B.11.c, and Permissives P7, P8 in LCO Table 3.3.1-2 with respect to the operational status of RCPs (P7 either validated or inhibited).

Mode requirements for sensors have been chosen to envelope the required modes of the functions and permissives they support. Mode requirements for individual sensors may be different depending upon which functions they support.

The Reactor Coolant System (RCS) Loop Level sensors (Sensor A.23) only provide input to the SIS Actuation on Low RCS Loop Level function. As shown in U.S. EPR Tier 2, LCO Table 3.3.1-2, the SIS Actuation on Low RCS Loop Level function is required to be operable in Modes 4, 5 and 6 with P15 permissive validated.

A discussion of RCP operation and the application of P15 permissive is provided in the Response to Question 16-311, Part 16-149(a).

Clarifications to the required Modes will be incorporated into the Technical specifications and Bases.

FSAR Impact:

U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications and Bases will be revised as described in the response and indicated on the enclosed markup.

Question 16-311

Followup to Question 16-166:

Bases enhancements to ensure information accuracy and consistency.

Response to Question 16-166:

As discussed in the Response to Question 16-311, Part 16-141(a), the equation describing the pressure drop calculation was deleted in U.S. EPR FSAR, Revision 2.

A description of how the SG pressure drop is detected will be added to the Bases description of the MSIV Isolation on SG Pressure Drop (All SGs) function.

FSAR Impact:

U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications Bases will be revised as described in the response and indicated on the enclosed markup.

Question 16-311

Followup to Question 16-190:

f) Clarification regarding the number of RCCA Units in Bases Table B 3.3.1-1 for Permissive P8.

Response to Question 16-190(f):

This issue was further clarified on Page 16-34 of the NRC's March 10, 2010 Safety Evaluation, which states:

> Bases Table B 3.3.1 of the FSAR markup provided with the June 30, 2009, response (Page B 3.3.1-107), does not specify the correct values for the minimum number of RCCA Units per division for Permissive P8.

P8 permissive in U.S. EPR FSAR Tier 2, Chapter 16, Bases Table B 3.3.1-1 will be revised in response to Question 16-311, Part 16-131(d) to show that only one RCCA Unit per division is required. Note that this corrects information that was previously provided in RAI 103, Supplement 2, Question 16-138, which added specific permissives to the Technical Specifications, including Bases Table B 3.3.1-1.

FSAR Impact:

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

Question 16-311

Followup to Question 16-209:

LCO reference omission from Reporting Requirements Section 5.6.4, Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR).

Response to Question 16-209

This issue was further clarified on Page 16-44 of the NRC's March 10, 2010 Safety Evaluation, which states:

> In RAI 103, Question 16-209, the staff requested that the applicant provide an explanation regarding the use of a footnote reference stating, "As specified in the Pressure Temperature Limits Report (PTLR)," to represent the Limiting Safety System Setting setpoint values specified for the Pressurizer Safety Relief Valve (PSRV) Actuation functions in the GTS Table 3.3.1-2. In a November 26, 2008, response to RAI 103, Question 16-209, the applicant confirmed that the PTLR was listed in TS Administrative Controls Section 5.6, "Reporting Requirements." The response only partially addressed the staff's concerns regarding the control requirements associated with the analytical methods used to determine the LSSS setpoint values to be specified in the PTLR. The staff noted that (1) Protection System LCO 3.3.1 was not identified among the individual specifications included in PTLR Section 5.6.4.a of the Reporting Requirements, and (2) the NRC-approved document describing the analytical methods used to determine the LSSS setpoint values for the PSRV Actuation functions, was not identified in PTLR Section 5.6.4.b of the "Reporting Requirements."

A reference to the U.S. EPR FSAR Tier 2, Chapter 16, Protection System LCO was added to Technical Specifications Section 5.6.4 in U.S. EPR FSAR, Revision 2. The analytical methods used to determine the RCS pressure and temperature limits are identified in Pressure-Temperature Limitations Report (PTLR), Section 5.6.4.b of the "Reporting Requirements." The PTLR was developed to reduce the need for plant cycle-specific License Amendments. Approval of the PTLR approach was based on the cycle specific values being determined using NRC approved methodologies. The calculation of Channel Uncertainties is not cycle specific. Reference to the NRC approved Topical Report that is utilized to determine Channel Uncertainties does not have to be referenced in the Reporting Requirements section of the Technical Specifications that provides the requirements for the PTLR.

FSAR Impact:

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

Question 16-312:

Potential Open Item

Provide the additional information and update the following RAI responses for each of the Instrumentation System Tech Spec items identified, based on the results of Audit Meetings between AREVA NP and NRC Staff on 7/30/09, 7/31/09, 8/13/09 and 8/14/09.

Request for Additional Information No. 110 (1295)

Question 16-312

Followup to Question 16-213:

Response to Question 16-213 states that "the subject text is now bracketed as described in the response to Question 16-212." The response to Question 16-212 removes the current list of PAM Instrumentation and associated discussions from U.S. EPR FSAR Tier 2, Chapter 16 Technical Specifications Section 3.3.2, and U.S. EPR FSAR Tier 2, Chapter 16, Technical Specification Bases B 3.3.2. There does not appear to be any bracketed text associated with the response to Question 16-212.

Response to Question 16-213:

This issue was further clarified on Page 16-46 of the NRC's March 10, 2010 Safety Evaluation, which states:

> In RAI 110, Question 16-213, the staff requested that the applicant provide an explanation regarding the determination of primary to secondary loop coupling in the PAM Bases discussion associated with Hot Leg Temperature Wide Range instrumentation on Page B 3.3.2-4 of Bases B 3.3.2, Revision 0. Clarification is needed with regard to how the Hot Leg Temperature WR instruments can be used to confirm primary to secondary loop coupling without Cold Leg Temperature WR instrumentation. In a March 19, 2009, response to RAI 110, Question 16-213, the applicant stated that the subject text is now bracketed as described in the response to RAI 110, Question 16-212. There does not appear to be any bracketed text as stated in the response, only a bracketed period. Note that the response to RAI 110, Question 16-212, removed the current list of PAM Instrumentation (including all references to LCO Table 3.3.2-1), and associated discussions from TS Section 3.3.2, and TS Bases B 3.3.2, on the basis that PAM variable selection criteria in RG 1.97, Revision 4, depend on prior development of EPGs, EOPs, and AOPs (procedures that cannot be completed prior to COL issuance).

This issue was further clarified on Page 16-46 of the NRC's March 10, 2010 Safety Evaluation, which states:

> The staff issued a follow-up RAI 300, Question 16-312 to document and address the staff's concerns regarding (1) primary-to-secondary loop coupling determination issues, and (2) potential discrepancies associated with bracketing of information in Bases Section B 3.3.2.

In the Response to RAI 110, Supplement 1, for this question, reference was made to bracketed text. The PAM Technical Specifications and Bases have been revised in U.S. EPR FSAR, Revision 2 and all required information has been provided. There are no longer any Combined License information items in the PAM Technical Specifications or Bases. In addition, there is no longer a discussion of primary to secondary loop coupling in the PAM Technical Specifications Bases. The discussion of the use of T_{hot} for determination of primary to secondary coupling was removed because the re-evaluation of the PAM instrument inventory, using a different methodology, did not indicate that T_{hot} was used as a key indication for this purpose. However, in order to support the closure of the above mentioned SER Open Item, the following explanation is provided. T_{hot} indications can be used to verify primary to secondary coupling by observing the T_{hot} response to changes in steam generator (SG) pressure. T_{hot} lowering in response to decreasing SG pressure is an indication that primary to secondary coupling exists. T_{hot} indication response will have a greater delay than when using T_{cold} instruments, due to low loop flow

rates and the greater distance from the SG to the T_{hot} sensors. Another indication of coupling is to verify that T_{hot} tracks changes in core exit temperatures. T_{hot} close to and tracking core exit temperatures is an indication that natural circulation exists, which requires primary to secondary coupling. An alternate indication of primary to secondary coupling, independent of reactor coolant system (RCS) temperature indications, is to verify the ability to feed and steam the SG while maintaining SG pressure. Heat transfer must exist to sustain SG pressure during steaming.

FSAR Impact:

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

Question 16-313

Potential Open Item

Provide the additional information and update the following RAI responses for each of the Electrical Power System Tech Spec items identified, based on the results of Audit Meeting between AREVA NP and NRC Staff on 6/24/09.

Request for Additional Information No. 74 (953)

Question 16-313

Followup to Question 16-11

The applicant is requested to include mode restriction information in EPR Surveillance Requirement (SR) 3.8.1.10 and associated Bases section. EPR SR 3.8.1.10 omits bracketed NOTE 1 in WOG SR 3.8.1.10 which addresses mode restrictions associated with performance of the surveillance. EPR Bases omits discussion of the Note presented in the corresponding WOG Bases as well.

Response to Question 16-11:

This issue was further clarified on Page 16-76 of the NRC's March 10, 2010 Safety Evaluation, which states:

> In RAI 74, Question 16-11, the staff requested that the applicant justify the omission of Mode Restriction information from GTS SR 3.8.1.10 and the associated Bases. GTS SR 3.8.1.10 omits bracketed Note 1 in Westinghouse STS SR 3.8.1.10, which states, "This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR." In an October 30, 2008, response to RAI 74, Question 16-11, the applicant stated that the proposed deviation from the STS is justified based on the acceptable small-risk associated with paralleling an EDG to offsite power for surveillance testing when considering the robust design features of the electrical distribution system and that three EDGs remain capable of mitigating a design-basis accident and supporting safe-shutdown of the nuclear power plant during performance of this surveillance testing. The associated STS Bases Reviewer's Note establishes the criteria for which the Mode Restrictions may be deleted. One of the criteria is that the performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant-safety systems. The Reviewer's Note specifically states that the Mode Restrictions may be deleted if it can be demonstrated to the staff, on a plant-specific basis, that performing the SR with the reactor in any of the restricted modes can satisfy the established criteria. The staff questioned the applicant's position on the basis that an electrical system perturbation of some magnitude can be expected from a full-load reject when paralleled to the grid. Also, every offsite electrical power system is different. There may be something unique to a particular system whereby an assessment determining the safety of the plant is warranted for performance of SR 3.8.1.10 in Modes 1 or 2.

The mode restriction information in NUREG-1431, Westinghouse Owners' Group (WOG) Standard Technical Specifications (STS) Surveillance Requirement (SR) 3.8.1.10, Note 1 states, "This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR." The Bases further clarifies the mode restriction note to indicate that this surveillance may be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns).

The U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications and Bases for SR 3.8.1.10 will be revised to incorporate the mode restriction information contained in the WOG Standard Technical Specifications.

FSAR Impact:

U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications and Bases will be revised as described in the response and indicated on the enclosed markup.

Question 16-313

Followup to Question 16-23:

a)The applicant is requested to include mode restriction information in EPR Surveillance Requirement (SR) 3.8.1.13 and associated Bases section. EPR SR 3.8.1.13 omits the bracketed NOTE in WOG SR 3.8.1.13 which addresses mode restrictions associated with performance of the surveillance. EPR Bases omits discussion of the Note presented in the corresponding WOG Bases as well.

Response to Question 16-23(a):

This issue was further clarified on Page 16-78 of the NRC's March 10, 2010 Safety Evaluation, which states:

> In RAI 74, Question 16-23, the staff requested that the applicant justify the omission of Mode Restriction information from GTS SR 3.8.1.13 and the associated Bases. GTS SR 3.8.1.13 omits the bracketed Note in Westinghouse STS SR 3.8.1.13, which states, "This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to re-establish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR." In an October 30, 2008, response to RAI 74, Question 16-23, the applicant stated that the proposed deviation from the STS is justified based on the testing having no affect on the EPSS or plant loads, the capability to restore the EDG to an available status within a short time, and that during testing three EDGs remain capable of mitigating a DBA and supporting safe-shutdown of the nuclear plant. The associated STS Bases Reviewer's Note establishes the criteria for which the Mode Restrictions may be deleted. One of the criteria is that the performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant-safety systems. The Reviewer's Note specifically states that the Mode Restrictions may be deleted if it can be demonstrated to the staff, on a plant-specific basis, that performing the SR with the reactor in any of the restricted Modes can satisfy the established criteria. … Note that GTS SR 3.8.1.18 is preceded by a Note that allows portions of the surveillance to be performed in Modes 1 through 4 to re-establish operability provided an assessment determines the safety of the plant is maintained or enhanced. There is no mention in the Bases discussion for SR 3.8.1.13 that the surveillance is strictly a logic function test or that it is to be performed without the EDG operating. Electrical system perturbations resulting from a failed surveillance performed with the EDG running would not be unexpected. Also, every offsite electrical power system is different. There may be something unique to a particular system whereby an assessment determining the safety of the plant is warranted for performance of SR 3.8.1.13 (diesel operating) in Modes 1 or 2.

The mode restriction information in WOG, SR 3.8.1.13 Note states, "This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR." The Bases further clarifies the mode restriction note by stating, "The reason for the Note is that performing the Surveillance would remove a required DG from service."

The U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications and Bases will be revised to incorporate the mode restriction information contained in the WOG Standard Technical Specifications. The Bases description of SR 3.8.1.13 will also be revised to state that the surveillance demonstrates

that emergency diesel generator noncritical protective functions are bypassed on an actual or simulated Loss of Offsite Power signal on the emergency bus concurrent with an actual or simulated Safety Injection System (SIS) actuation signal.

FSAR Impact:

U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications and Bases will be revised as described in the response and indicated on the enclosed markup.

Question 16-313

Followup to Question 16-29:

b)The applicant is requested to resolve inconsistencies identified in Bases B 3.8.3 regarding the Diesel Lube Oil System. The revision 1 Bases discussions associated with the fourth paragraph on page B 3.8.3-1 and SR 3.8.3.2 on page B 3.8.3-5 appear to contain conflicting information.

Response to Question 16-29(b):

This issue was further clarified on Page 16-80 of the NRC's March 10, 2010 Safety Evaluation, which states:

> Bases B 3.8.3, Revision 1, discussions associated with the fourth paragraph on Page B 3.8.3-1 and SR 3.8.3.2, on Page B 3.8.3-5 contain conflicting information regarding diesel lube oil system specifics.

To resolve any appearance of conflict between the two statements, the U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications Bases 3.8.3 Background and Bases description of SR 3.8.3.2 will be revised.

FSAR Impact:

U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications Bases will be revised as described in the response and indicated on the enclosed markup.

Question 16-313

Followup to Question 16-53:

U.S. EPR safety analysis assumptions are satisfied with three operable EDGs and the alternate feed established. The divisional pair concept in application of implementing the alternate feed provides a standby source of power to safety-related components when an EDG is out of service. By maintaining divisional pairs physically and electrically separate, and selecting diverse power sources between the divisional pairs to accomplish required safety functions, the electrical distribution contains the required independence and redundancy to perform the required safety functions assuming a single failure. Although the alternate feed alignment is not a temporary modification in that it is part of the actual design, the referenced condition is not the normal alignment and is aligned when in a Tech Spec Action Statement that is intended to be temporary. CTSB requested the Electrical Engineering Technical Branch (EEB) review the 120-day Required Action Time for concurrence.

EEB raised the following concerns based on their review:

> In RAI No. 11, Question 08.03.01-13, the staff expressed that the 120-day completion time currently specified for LCO 3.8.1, REQUIRED ACTION B.5, for restoration of a single inoperable diesel is excessive. In the response to RAI No. 11, Question 08.03.01-3, the applicant stated that the alternate feed configuration will be used only during specific maintenance activities, and cited EDG maintenance as an example. Provide a detailed list of maintenance activities that would require a EDG to be out of service for a period of 120 days, the associated maintenance time needed for each activity, and state that how frequently those maintenance activities will be needed (e.g., every 10 years). In addition, provide what type of compensatory measures would be in effect during the 120 days, and what control configuration management would be in place for an additional EDG failure. The applicant is requested to provide the additional information necessary to assure the staff that use of the alternate feed configuration required to support EDG maintenance will be infrequent.

Response to Question 16-53:

This issue was further clarified on Page 16-83 of the March 10, 2010 Safety Evaluation by the NRC, which states:

> In RAI 74, Question 16-53, the staff requested that the applicant enhance the Bases discussion associated with Required Action B.5 of LCO 3.8.1, “AC Sources − Operating,” as an added means of justification for the proposed 120-day completion time beyond the claim that (1) it provides a reasonable time for repairs, (2) the probability of a postulated accident or AOO occurring during this period is low, and (3) operation of the inoperable EDG with alternate feed aligned in its divisional pair is not assumed in the safety analysis to mitigate the consequences of postulated accidents or AOOs. The alternate feed design feature serves as the basis for the 120 day allowed outage time (AOT). Although the alternate feed alignment is not a temporary modification in that it is part of the actual design, the referenced configuration is not the normal alignment and is implemented only when in a TS Action Statement that is intended to be temporary in nature. In an October 30, 2008, response to RAI 74, Question 16-53, the applicant touched on certain aspects of the safety analysis and described emergency power supply system specifics. However, it did not address the staff's concern that use of the alternate feed configuration required to support EDG maintenance will be infrequent. The response to Chapter 8 RAI 11, Question 08.03.01-3, states that the alternate feed

design feature is only used during specific maintenance activities, and cites EDG maintenance as an example. In a follow-up RAI 300, Question 16-313, for the staff requested that the applicant (1) provide a detailed list of maintenance activities that would result in an EDG being out of service for a period up to 120 days, (2) provide the associated maintenance time needed for each activity, (3) state how frequently these maintenance activities will be needed (e.g., every 10 years), and (4) provide what type of compensatory measures would be in effect during the 120 days and what configuration control management would be in place for an additional EDG failure.

The following additional issues were subsequently identified by the NRC Staff:

The Staff has concerns about the use of the 120 days Completion Time for an inoperable EDG that need further clarification. The applicant, using the methodology cited in Regulatory Guide (RG) 1.155, "Station Blackout (SBO)," has selected an eight hours SBO coping duration which is based upon an EDG reliability of 0.95. However, RG 1.155 which establishes how nuclear power plant licensees meet 10 CFR 50.63, "Loss of All Alternating Current Power," also known as the SBO Rule, assumes a negligible EDG unavailability period of 0.007 (0.7 percent) due to maintenance and testing activities. The 120 day Completion Time for an inoperable EDG represents a 33% unavailability period on an annual basis.

Further, 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," also known as the Maintenance Rule, requires that licensees ensure that "the objective of preventing failures of structures, systems, and components (SSCs) through maintenance is appropriately balanced against the objective of minimizing unavailability of SSCs due to monitoring or preventive maintenance." It is not clear how the use of the 120 day Completion Time for an inoperable EDG minimize unavailability to support the EDG performance requirements. Please elaborate on how the U.S. EPR design satisfies the SBO Rule and the Maintenance Rule using the proposed 120 days Completion Time for an inoperable EDG.

The Required Action to restore the first inoperable EDG to operable status within 120 days will be removed from the U.S. EPR Technical Specifications. This Required Action is not considered to be necessary since establishing the alternate feed is a permanent design feature that satisfies the design configuration assumptions in the safety analysis. The plant is capable of mitigating a design basis event or operational occurrence coupled with a single failure and a loss of offsite power in this configuration. The requested information regarding maintenance activities is no longer relevant.

With regards to the concern regarding a relationship between the Technical Specification Completion Time for the first inoperable U.S. EPR EDG and the selected Station Blackout (SBO) coping duration, AREVA has concluded that the SBO coping evaluation is independent of the Technical Specification Completion Time for an inoperable EDG. The selection of the SBO coping duration is discussed in U.S. EPR FSAR Tier 2, Section 8.4 and was reviewed by the NRC Staff as documented in the Advanced Safety Evaluation Report (SER) for Chapter 8 of the U.S. EPR FSAR performed by the NRC. In summary, there are four EDGs in the design of the U.S. EPR. Only one EDG is required during an SBO scenario to power an Emergency Feedwater train and other necessary equipment for removing decay heat to achieve and maintain safe shutdown. The U.S. EPR is therefore classified as EAC Power Configuration Group A. Regulatory Guide 1.155 uses two EDG reliability targets (0.95, 0.975) for each EDG in emergency AC power Configuration Group A. The lower value of 0.95 was used for the U.S. EPR. In Table 2 of the Regulatory Guide, the most conservative SBO duration capability for a Group A plant is 8 hours. As noted in the SER: "the applicant's design has enveloped an eight-hour coping duration based on the worst case site conditions. Since the applicant chose the most

conservative analytical assumptions recommended in RG 1.155, the Staff finds that the eight-hour SBO coping duration for the U.S. EPR design conforms to the guidance provided in Section C.3.1 of RG 1.155."

10 CFR 50.36, Technical Specifications, requires that Limiting Conditions for Operation be included, which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. As required by 10 CFR 50.36, Criterion 3, the EDGs are included in the Technical Specifications since they are: "A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident (DBA) or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier." Station Blackout is not a design basis accident or transient, and the requirement for equipment necessary to mitigate an SBO is not addressed nor included in the Technical Specifications.

In terms of the concern about a relationship between a Technical Specification Completion Time for the first inoperable U.S. EPR EDG and the actual EDG unavailability, AREVA has concluded that EDG unavailability is independent of the Technical Specification Completion Time for an inoperable EDG. The EDG target reliability of 0.95 is specified in U.S. EPR FSAR Tier 2, Section 8.2.4.6.1. 10 CFR 50.65, Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, requires that each holder of a Combined Operating License monitor the performance or condition of SSCs, against licensee-established goals, in a manner sufficient to provide reasonable assurance that these SSCs are capable of fulfilling their intended functions. Availability of equipment, including the EDGs, is addressed by the Maintenance Rule. Regulatory Guide 1.160, Revision 2, Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, endorses Revision 2 of NUMARC 93-01, Revision 4, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants. As stated in NUMARC 93-01, Section 9.4, Goal Setting and Monitoring:

> "Regulations and utility commitments (e.g., Emergency Diesel Generator docketed reliability targets in response to the Station Blackout Rule, 10 CFR 50.63) provide a baseline for testing and surveillance activities of some SSCs under the scope of the Maintenance Rule."

The unavailability period described in RG 1.155 is not specifically applicable to the Completion Time for the first inoperable U.S. EPR EDG. Since the assumption of the 0.007 unavailability, the NRC has promulgated the Maintenance Rule. The Maintenance Rule enforces controls to limit the out of service time of SSCs in a manner sufficient to provide reasonable assurance that these SSCs are capable of fulfilling their intended function.

FSAR Impact:

U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications and Bases will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

Table 3.3.1-1 (page 6 of 9~~7~~)
Protection System Sensors, Manual Actuation Switches,
Signal Processors, and Actuation Devices

COMPONENT	REQUIRED NUMBER OF SENSORS, SWITCHES, SIGNAL PROCESSORS, OR ACTUATION DEVICES	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	MINIMUM REQUIRED FOR FUNCTIONAL CAPABILITY	CONDITION	SURVEILLANCE REQUIREMENTS
~~22~~25. Reactor Coolant System (RCS) Loop Flow	4 per loop	1,2[(~~e~~g)]	3 per loop	J	SR 3.3.1.5 SR 3.3.1.6[(b)(c)] SR 3.3.1.10
~~23~~26. RCS Loop Level	4	4[(~~j~~k)]	3	O	SR 3.3.1.5 SR 3.3.1.6[(b)(c)] SR 3.3.1.10
	4	5[(k)],6[(k)]	2	R	SR 3.3.1.5 SR 3.3.1.6[(b)(c)] SR 3.3.1.10
~~24~~27. Reactor Trip Circuit Breaker Position Indication	4	1,2[(~~k~~l)],3[(~~k~~l)]	3	K	SR 3.3.1.5 SR 3.3.1.6[(b)(c)] SR 3.3.1.10
~~25~~28. Rod Cluster Control Assembly (RCCA) Analog Position Indicators	89	1[(~~d~~f)]	89	U	SR 3.3.1.5 SR 3.3.1.6[(b)(c)]
~~26~~29. RCCA Shutdown Bank Bottom Position Indicators	~~89~~12 per division 4 divisions	3[(~~e~~e)],4[(~~e~~e)],~~5~~[(~~e~~)]	12 per division 3 divisions ~~89~~	~~Q~~O	SR 3.3.1.5 SR 3.3.1.6[(b)(c)]
	12 per division 4 divisions	5[(e)]	12 per division 3 divisions	Q	SR 3.3.1.5 SR 3.3.1.6[(b)(c)]
~~27~~30. Self-Powered Neutron Detectors	72	1[(~~d~~f)]	67	H	SR 3.3.1.2[(b)(c)] SR 3.3.1.5

16-311, Part 16-149(b)

(b) If the as-found sensor calibration setting values are outside their predefined as-found tolerance for the calibrations settings (e.g., 0, 25, 50, 75, and 100%), then the sensor shall be evaluated to verify that it is functioning as required before returning the sensor to service.

(c) The sensor shall be calibrated such that the as-left sensor calibration setting values are within the as-left tolerance around the calibration settings at the completion of the surveillance; otherwise, the sensor shall be declared inoperable. The methodologies used to determine the as-found and the as-left CALIBRATION setting tolerances are specified in a document controlled under 10 CFR 50.59.

(~~e~~e) With P7 permissive ~~P7~~ inhibited (one or more RCPs in operation).

(~~d~~f) With P2 permissive ~~P2~~ validated.

(~~e~~g) With P5 permissive ~~P5~~ validated.

(~~j~~k) With P15 permissive ~~P15~~ validated.

(~~k~~l) Except when all MFW full load and low load lines are isolated.

Table 3.3.1-2 (page 5 of 7)
Acquisition and Processing Unit Requirements Referenced from Table 3.3.1-1

TRIP / ACTUATION FUNCTION / PERMISSIVE	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	MINIMUM REQUIRED FOR FUNCTIONAL CAPABILITY[a]	NOMINAL ~~LIMITING~~ TRIP SETPOINT ~~/ DESIGN LIMIT~~	CONDITION
9.a. Containment Isolation (Stage 1) on High Containment Pressure	1,2,3,4	3 divisions	[18.7 psia[(b)(c)]]	N
9.b. Containment Isolation (Stage 1) on SIS Actuation	1,2,3,4	3 divisions	[NA]	N
9.c. Containment Isolation (Stage 2) on High-High Containment Pressure	1,2,3,4	3 divisions	[~~≤~~ 36.3 psia[(b)(c)]]	N
9.d. Containment Isolation (Stage 1) on High Containment Radiation	1,2,3,4	3 divisions	[≤ 100 x background[(b)(c)]]	N
10.a. Emergency Diesel Generator (EDG) Start on Degraded Grid Voltage	1,2,3,4,(p)	4 divisions	[≥ 6210 V and ≤ 6350 V; ≥ 7 sec. and ≤ 11 sec. w/SIS, ≥ 270 sec. and ≤ 300 sec. wo/SIS[(b)(c)]]	P
	5,6,(~~r~~p)	2 divisions		P
10.b. EDG Start on LOOP	1,2,3,4,(p)	4 divisions	[≥ 4830 V and ≤ 4970 V; ≥ 0.4 sec. and ≤ 0.6 sec.[(b)(c)]]	P
	5,6,(~~r~~p)	2 divisions		P
11.a. Chemical and Volume Control System (CVCS) Charging Line Isolation on High-High Pressurizer Level	1,2,3,4(~~s~~q)	3 divisions	[80% Measuring Range[(b)(c)]]	N
11.b. CVCS Isolation on Anti-Dilution Mitigation (ADM) - Shutdown Conditions (RCP not operating)	3(~~t~~r),4(~~t~~r)	3 divisions	[927 ppm[(b)(c)]]	O
	5(~~t~~r),6(r)	2 divisions		Q

16-311, Part 16-149(a)

(a) A division is OPERABLE provided: a) the minimum sensors required for functional capability for all sensors providing input to the Trip/Actuation Function/Permissive are OPERABLE; and b) the associated signal processors are OPERABLE.

~~(b) If the as-found setpoint is outside its predefined as-found tolerance, then the Trip/Actuation Function shall be evaluated to verify that it is functioning as required before returning the Trip/Actuation Function to service.~~

~~(c) The setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the division shall be declared inoperable. Setpoints more conservative than the LTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures to confirm Trip/Actuation Function performance. The methodologies used to determine the as-found and the as-left tolerances are specified in a document controlled under 10 CFR 50.59.~~

(~~r~~p) During movement of irradiated fuel assemblies.

(~~s~~q) With P17 permissive ~~P17~~ inhibited.

(~~t~~r) With P7 permissive ~~P7~~ validated (no RCPs in operation).

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One EDG inoperable.	B.1 Perform SR 3.8.1.1 for the offsite circuits.	1 hour AND Once per 8 hours thereafter
	AND	
	B.2 Declare required feature(s) supported by the inoperable EDG inoperable when its required redundant feature(s) is inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)
	AND	
	B.3.1 Determine OPERABLE EDGs are not inoperable due to common cause failure.	24 hours
	OR	
	B.3.2 Perform SR 3.8.1.2 for OPERABLE EDGs.	24 hours
	AND	
	B.4 ----------NOTE---------- Required Action B.4 is not applicable if both EDGs in the same divisional pair are inoperable and Condition C is entered. ----------	
16-313, Part 16-53	Align the alternate feed from the remaining OPERABLE EDG in the divisional pair.	72 hours
	~~AND~~	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	~~B.5 Restore EDG to OPERABLE status.~~	~~120 days~~
C. Two EDGs inoperable.	C.1 ----------NOTE---------- Required Action C.1 is not applicable if both EDGs in the same divisional pair are inoperable. ---------- Align the alternate feed from the remaining OPERABLE EDG in one divisional pair.	2 hours
	AND	
	C.2 Restore one EDG to OPERABLE status.	72 hours
D. Two offsite circuits inoperable.	D.1 Declare required feature(s) inoperable when its redundant feature(s) is inoperable.	12 hours from discovery of Condition D concurrent with inoperability of redundant features
	AND	
	D.2 Restore one offsite circuit to OPERABLE status.	24 hours

16-313, Part 16-53

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.10 16-313, Part 16-11	----------NOTES---------- [1. This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. 2.] If performed with EDG synchronized with offsite power, it shall be performed at a power factor ≤ 0.9. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. ---------- Verify each EDG does not trip and voltage is maintained ≤ 8280 V during and following a load rejection of ≥ 8550 kW and ≤ 9500 kW.	24 months

SURVEILLANCE REQUIREMENTS (continued)

16-313, Part 16-23(a)

SURVEILLANCE		FREQUENCY
SR 3.8.1.13	----------NOTE---------- [This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.] ---------- Verify each EDG's noncritical automatic trips are bypassed on an actual or simulated Loss of Offsite Power signal on the emergency bus concurrent with ~~; or an actual or simulated Safety Injection System actuation~~ signal.	24 months

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

In MODES 5 and 6, automatic actuation of the ESF Functions is not normally required because adequate time is available to evaluate plant conditions and respond by manually operating the ESF components if required. Exceptions to this are:

- ESF 3.c: SIS Actuation on Low RCS Loop Level,
- ESF 10.a: Emergency Diesel Generator (EDG) Start on Degraded Grid Voltage,
- ESF 10.b: EDG Start on Loss of Offsite Power (LOOP),
- ESF 11.b: Chemical and Volume Control System (CVCS) Isolation on Anti-Dilution Mitigation (ADM) - Shutdown Condition (RCP not operating),
- ESF 11.c: CVCS Isolation on ADM - Standard Shutdown Conditions,
- ESF 12.a and 12.b: PSRV Actuation - First and Second Valve, and
- ESF 13: Control Room Heating, Ventilation and Air Conditioning (HVAC) Reconfiguration to Recirculation Mode on High Intake Activity.

These ESF Functions are required to be OPERABLE in MODES 5 and 6, and during movement of irradiated fuel assemblies to ensure that:

- Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;
- Systems needed to mitigate a fuel handling accident are available; and
- Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available.

16-311, Part 16-145(a)

The specific safety analysis and OPERABILITY requirements applicable to each PS protective function ~~is~~ are identified below. Permissives that enable a credited function when the Permissives are validated ~~will be~~are included in the Technical Specifications. Permissives that disable a Reactor Trip or ESF function when validated are not part of a primary success path of a safety sequence analysis. While their failure may lead to a spurious reactor trip or ESF actuation, their functioning is not credited to mitigate an accident of anticipated operational occurrence, nor to keep the plant in an analyzed condition.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

This function mitigates the following postulated accidents or AOOs:

- Excessive increase in secondary steam flow,
- Spurious opening of one SG safety or relief valve,
- Steam system piping failure, and
- Feedwater system piping failure.

The MSIV Isolation on SG Pressure Drop function requires four divisions of the following sensors and processors to be OPERABLE in MODES 1 and 2, and in MODE 3, except when all MSIVs are closed:

- SG Pressure sensors,
- APUs, and
- ALUs.

The ~~LTSP~~ NTSP for the MSIV Isolation on SG Pressure Drop function is set low enough to avoid SG pressure fluctuations during normal operation and high enough to isolate an SG and limit the blowdown to the value assumed in the safety analysis.

16-311, Part 16-166

The condition to be detected is an SG pressure drop greater than a specified value. This is accomplished by using a variable pressure setpoint tracking the steam line pressure with a constant offset. The setpoint has a limitation on its maximum pressure and its maximum rate of decrease. If the steam line pressure increases, the setpoint will increase until the limitation on maximum pressure is reached. The maximum value of the setpoint is limited in order to avoid MSIV isolation during an SG pressure decrease following a reactor trip and turbine trip, which would result in an SG overpressure condition. If the steam line pressure decreases, the setpoint will follow the decrease as long as the rate is less than or equal to the limitation on maximum rate of decrease. If the steam line pressure decreases more rapidly than the limitation on the maximum rate of decrease, the margin between the actual pressure and the setpoint will decrease until the steam line pressure equals the setpoint and protective action occurs. ~~An SG pressure drop is detected by using a variable low setpoint equal to the actual SG pressure minus a fixed value, with a limitation placed on the rate of decrease of the setpoint.~~

There are no ~~automatic~~ permissives associated with this function.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

This function protects against a CVCS malfunction that causes an increase in RCS water inventory.

The automatic CVCS Charging Line Isolation on High-High Pressurizer Level function requires the following sensors and processors to be OPERABLE in MODES 1, 2, 3, and MODE 4 when the cold leg temperature is greater than or equal to 248°F:

- Pressurizer Level (Narrow Range) sensors (4 divisions),
- APUs (4 divisions), and
- ALUs (Divisions 1 and 4).

The ~~LTSP~~ NTSP is low enough to initiate appropriate mitigative actions in time to prevent the pressurizer from overfilling during the CVCS Malfunction event that may increases RCS inventory, but high enough to prevent spurious operations.

~~Inhibiting~~ Inhibition of the P17 permissive ~~disables~~ automatically enables the CVCS Charging Line Isolation on High-High Pressurizer Level function when the cold leg temperature is ~~less~~ greater than or equal to approximately 248°F. When ~~above~~ below this threshold, the function is disabled by ~~validating~~ manual validation of the P17 permissive ~~P12~~.

b. Isolation on ADM - Shutdown Condition (RCP not operating)

The ADM function in the Shutdown Condition mitigates a dilution event where no RCPs are in operation. This function ensures that:

- The dilution is stopped when the protection is actuated, and
- The core remains sub-critical.

16-311, Part 16-149(a)

The automatic CVCS Isolation on ADM - Shutdown Condition (RCP not operating) function is required to be OPERABLE in MODES 3, 4, ~~and~~ 5, and 6 with no RCPs in operation~~, and in MODE 6~~.

The automatic CVCS Isolation on ADM - Shutdown Condition (RCP not operating) function requires the following sensors and processors:

- Boron Concentration - CVCS Charging Line sensors (4 divisions),
- Boron Temperature - CVCS Charging Line sensors (4 divisions),
- APUs (4 divisions), and
- ALUs (Divisions 1 and 4).

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Hot leg pressure measurements, hot leg temperature measurements, and cold leg temperature measurements are used to calculate core THERMAL POWER. These calculated core THERMAL POWER levels are compared to the setpoint. When three out of four of the calculated core THERMAL POWER levels are greater than the setpoint, the operator is prompted to manually validate the permissive.

The value of the permissive was selected at the boundary between the operating range of the ~~i~~Intermediate ~~r~~Range ~~d~~Detectors and the ~~p~~Power ~~r~~Range ~~d~~Detectors.

16-311, Part 16-145(a)

Permissives that disable a reactor trip or ESF function when the permissives are validated are not part of a primary success path of a safety sequence analysis. While their failure may lead to a spurious reactor trip or ESF actuation, their functioning is not credited to mitigate an accident or anticipated operational occurrence, nor to keep the plant in an analyzed condition. Since the P6 permissive ~~P6~~ only disables functions when the permissive is validated, it is not within the scope of 10 CFR 50.36, Criterion 3.

5. P7 - RCP Not in Operation

The P7 permissive facilitates plant heat-up and cooldown by disabling certain ESF functions.

The P7 permissive is utilized in the following reactor trips or ESF functions:

- ESF 11.b: CVCS Isolation on ADM - Shutdown Condition (RCP not operating), and
- ESF 11.c: CVCS Isolation on ADM - Standard Shutdown Conditions.

The P7 permissive requires four divisions of the following sensors and processors to be OPERABLE in MODES 3, 4, 5, and 6 with no RCPs in operation:

- RCP Breaker Position Indication,
- RCP Bus Breaker Position Indication,
- RCP Speed,
- ~~RCP Current sensors,~~
- APUs, and
- ALUs.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

8. P13 - Hot Leg Temperature Lower than Threshold

The P13 permissive defines when steam generator draining and filling operations are allowed. The P13 permissive is utilized in the following reactor trips or ESF functions:

- Reactor Trip 17: Low SG Level,
- Reactor Trip 18: High SG Level,
- ESF 2.b: MFW Full Load Isolation on High SG Level (Affected SG~~s~~),
- ESF 2.e: SSS Isolation on High SG Level for Period of Time (Affected SG~~s~~),
- ESF 6.a: EFWS Actuation on Low-Low SG Level (Affected SG~~s~~), and
- ESF 6.b: EFWS Actuation on LOOP and SIS Actuation (All SGs).

Hot Leg Temperature (WR) measurements are compared to the P13 setpoint (approximately 200°F).

The value of the permissive was selected in order to permit draining and filling operations during shutdown and LHSI/RHR in operation without generating protection signals.

16-311, Part 16-145(a)

Permissives that disable a reactor trip or ESF function when the permissives are validated are not part of a primary success path of a safety sequence analysis. While their failure may lead to a spurious reactor trip or ESF actuation, their functioning is not credited to mitigate an accident or anticipated operational occurrence, nor to keep the plant in an analyzed condition. Since the P13 permissive ~~P13~~ only disables functions when the permissive is validated, it is not within the scope of 10 CFR 50.36, Criterion 3.

9. P14 - Hot Leg Pressure and Hot Leg Temperature Lower than Thresholds

The P14 permissive defines when the residual heat removal system is allowed to be connected to the RCS.

The P14 permissive is utilized in the following reactor trip or ESF functions:

- ESF 5 - Partial Cooldown Actuation on SIS Actuation, and
- ESF 7.a - MSRT Actuation on High SG Pressure (Affected SG) (for setpoint control).

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

25~~22~~. RCS Loop Flow

Four RCS Loop Flow sensors per loop (16 total) are required to be OPERABLE in MODE 1, and in MODE 2 when RTP is greater than ~~or equal to~~ approximately 10^{-5} % as shown on the ~~i~~Intermediate ~~r~~Range ~~d~~Detectors. These sensors support the following functions and Permissives:

- Reactor Trip 1.a: Low DNBR,
- Reactor Trip 1.b: Low DNBR and (Imbalance or Rod Drop (1/4)),
- Reactor Trip 1.c: Low DNBR and Rod Drop (2/4),
- Reactor Trip 1.d: Low DNBR - High Quality,
- Reactor Trip 1.e: Low DNBR - High Quality and (Imbalance or Rod Drop (1/4)),
- Reactor Trip 4: High Core Power Level,
- Reactor Trip 5: Low Saturation Margin,
- Reactor Trip 6a: Low-Low RCS Loop Flow Rate in One Loop,
- Reactor Trip 6b: Low RCS Loop Flow Rate in Two Loops, and
- P6 permissive ~~P6~~: Thermal Core Power Higher than Threshold.

26~~23~~. RCS Loop Level

16-311, Part 16-149(b)

Four RCS Loop Level sensors are required to be OPERABLE in:

- MODES 4, 5 and 6 when no RCPs are running, the hot leg pressure is less than approximately 464 psia, and the hot leg temperature is less than approximately 350ºF., ~~and MODES 5 and 6.~~

These sensors support ESF 3.c: SIS Actuation on Low RCS Loop Level function.

27~~24~~. RTCB Position Indication

Four RTCB Position Indication sensors are required to be OPERABLE in MODE 1, and in MODES 2 and 3 except when all MFW full load and low load lines are isolated. These sensors support the following functions:

- ESF 1: Turbine Trip on Reactor Trip,
- ESF 2.a: MFW Full Load Isolation on Reactor Trip (All SGs), and
- ESF 2.e: SSS Isolation on High SG Level for Period of Time (Affected SG~~s~~).

Table B 3.3.1-1 (page 8 of ~~11~~14)
Protection System (PS) Functional Dependencies

TRIP/ACTUATION FUNCTION/PERMISSIVE	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	COMPLETE DIVISIONS FOR FUNCTIONAL CAPABILITY SENSORS / PROCESSORS	DIVISION 1	DIVISION 2	DIVISION 3	DIVISION 4
11.b. CVCS Isolation on Anti-Dilution Mitigation (ADM) - Shutdown Condition (RCP not operating)	3(~~s~~r),4(~~s~~r), ~~5(s),6~~ 5(r), 6(r) 16-311, Part 16-149(a)	3 2	Boron Concentration Boron Temperature / Acquisition and Processing Unit	Boron Concentration Boron Temperature / Acquisition and Processing Unit	Boron Concentration Boron Temperature / Acquisition and Processing Unit	Boron Concentration Boron Temperature / Acquisition and Processing Unit
	3(~~s~~r),4(~~s~~r), 5(~~s~~r),6(r)	2	Actuation Logic Unit (3 of 4)			Actuation Logic Unit (3 of 4)
11.c. CVCS Isolation on ADM - Standard Shutdown Conditions	3(~~s~~t),4(~~s~~t), ~~5(t)~~ 5(s)	3 2	Boron Concentration Boron Temperature CVCS Charging Line Flow Cold Leg Temperature (WR) / Acquisition and Processing Unit	Boron Concentration Boron Temperature CVCS Charging Line Flow Cold Leg Temperature (WR) / Acquisition and Processing Unit	Boron Concentration Boron Temperature CVCS Charging Line Flow Cold Leg Temperature (WR) / Acquisition and Processing Unit	Boron Concentration Boron Temperature CVCS Charging Line Flow Cold Leg Temperature (WR) / Acquisition and Processing Unit
	3(~~s~~t),4(~~s~~t), 5(~~s~~t)	2	Actuation Logic Unit (3 of 4)			Actuation Logic Unit (3 of 4)

(~~s~~r) With P7 permissive ~~P7~~ validated (no RCPs in operation).
(~~s~~t) With P7 permissive ~~P7~~ inhibited (one or more RCPs in operation).

BASES

ACTIONS (continued)

of the redundant counterpart to the inoperable feature. Additionally, the 4 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a postulated accident occurring during this period.

B.3.1 and B.3.2

Required Action B.3.1 provides an allowance to avoid unnecessary testing of OPERABLE EDGs. If it can be determined that the cause of the inoperable EDG does not exist on the OPERABLE EDGs, SR 3.8.1.2 does not have to be performed. If the cause of inoperability exists on other EDGs, the other EDGs would be declared inoperable upon discovery. Once the failure is repaired, the common cause failure no longer exists, and Required Action B.3.1 is satisfied. If the cause of the initial inoperable EDG cannot be confirmed not to exist on the remaining EDGs, performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of those EDGs.

In the event the inoperable EDG is restored to OPERABLE status prior to completing either B.3.1 or B.3.2, the plant corrective action program will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B.

16-313, Part 16-53

According to Generic Letter 84-15 (Ref. 7), 24 hours is reasonable to confirm that the OPERABLE EDGs are not affected by the same problem as the inoperable EDG.

B.4 ~~and B.5~~

If one EDG is inoperable and the alternate feed is not aligned, certain required safety systems, safety support systems, and components that do not have adequate redundancy to support maintenance, do not have sufficient AC power source availability to ensure the completion of all safety functions for a postulated accident coincident with a single failure and the loss of offsite power.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition B without the alignment of the alternate feed for a period that should not exceed 72 hours. With the alternate feed aligned, the electric power sources required by GDC 17 are available at the required voltage and capacity for the nuclear station and capable of withstanding a system

BASES

ACTIONS (continued)

contingency such as (a) a single failure involving loss of generation by the nuclear unit, any other critical generation source, or loss of power from a transmission system element, or (b) a double failure involving a loss of power from the transmission network and the loss of one division of onsite AC power.

In Condition B, the remaining OPERABLE EDGs and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. The 72 hour Completion Time to align the alternate feed from a division containing an OPERABLE EDG takes into account the capacity and capability of the remaining AC sources and the low probability of a postulated accident occurring during this period.

16-313, Part 16-53

~~The 120 day Completion Time to restore an EDG to OPERABLE with the alternate feed aligned in its divisional pair is reasonable since its operation is not assumed in the safety analysis to mitigate the consequences of postulated accidents or AOOs, it provides a reasonable time for repairs, and the low probability of a postulated accident or AOO occurring during this period.~~

C.1 and C.2

The Required Actions have been modified by a Note. The Note recognizes that the alternate feed from an OPERABLE EDG in a divisional pair would not provide power if both EDGs in the divisional pair were inoperable. Therefore, this Required Action does not need to be performed.

Each division can be aligned to power a subset of loads (“alternate fed loads”) in the other division in its divisional pair by means of an “alternate feed.” An alternate feed provides a standby source of power to required safety systems, safety support systems, or components that do not have the required redundant trains to support maintenance. With an OPERABLE EDG in each divisional pair, and at least one alternate feed aligned from an OPERABLE EDG, standby power is provided to the minimum required ESF functions to achieve completion of required safety functions following an AOO or postulated accident, regardless of which two EDGs are inoperable.

BASES

SURVEILLANCE REQUIREMENTS (continued)

16-313, Part 16-11

This SR has been modified by [two Notes~~a Note~~. The reason for Note 1 is that during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR.

~~The~~ Note 2] ensures that the EDG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of ≤ 0.9. This power factor is representative of the actual inductive loading an EDG would see under postulated accident conditions. Under certain conditions, however, the Note allows the Surveillance to be conducted at a power factor other than ≤ 0.9. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to ≤ 0.9 results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to 0.9 while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the EDG excitation levels needed to obtain a power factor of 0.9 may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the EDG. In such cases, the power factor shall be maintained as close as practicable to 0.9 without exceeding the EDG excitation limits.

BASES

SURVEILLANCE REQUIREMENTS (continued)

16-313, Part 16-11

----------REVIEWER'S NOTE----------
The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable,

b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and

c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.

SR 3.8.1.11

As required by Regulatory Guide 1.9 (Ref. 3), Section 2.2.5, this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the EDG. It further demonstrates the capability of the EDG to automatically achieve the required voltage and frequency within the specified time.

The EDG autostart time of 15 seconds is derived from requirements of the accident analysis to respond to a postulated large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability is achieved.

The requirement to verify the connection and power supply of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the EDG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, the Low Head Safety Injection valves are not desired to be stroked open, or residual heat removal (RHR) systems performing a decay heat removal function are not desired to be realigned. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the EDG systems to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.13

16-313, Part 16-23(a)

This Surveillance demonstrates that EDG noncritical protective functions are bypassed on an actual or simulated Loss of Offsite Power signal on the emergency bus~~; or~~ concurrent with an actual or simulated SIS actuation signal. Noncritical automatic trips are all automatic trips except:

a. Engine overspeed;

b. Generator differential current;

c. Low lube oil pressure;

d. High jacket water temperature; and

e. Low Essential Service Water pressure.

The noncritical trips are bypassed during postulated accidents and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The EDG availability to mitigate the postulated accident is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the EDG.

The 24 month Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3), Table 1, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

BASES

SURVEILLANCE REQUIREMENTS (continued)

16-313, Part 16-23(a)

[The SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required EDG from service. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR.]

----------REVIEWER'S NOTE----------
The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable,

b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and

c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.

SR 3.8.1.14

Regulatory Guide 1.9 (Ref. 3) requires demonstration once per fuel cycle that the EDGs can start and run continuously at full load capability for an interval of not less than 24 hours, ≥ 2 hours of which is at a load equivalent to 105% - 110% of the continuous duty rating and the remainder of the time at a load equivalent to the continuous duty rating of the EDG. The EDG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.3 Diesel Fuel Oil, Lube Oil, and Starting Air

BASES

BACKGROUND

Each emergency diesel generator (EDG) is provided with a storage tank having a fuel oil capacity sufficient to operate that diesel for a period of 7 days while the EDG is supplying maximum post loss of coolant accident load demand discussed in FSAR Section 9.5.4.2 (Ref. 1). The maximum load demand is calculated using the assumption that a minimum of any two EDGs are available. This onsite fuel oil capacity is sufficient to operate the EDGs for longer than the time to replenish the onsite supply from outside sources.

Fuel oil is transferred from storage tank to day tank by either of two transfer pumps associated with each storage tank. Redundancy of pumps and piping precludes the failure of one pump, or the rupture of any pipe, valve or tank to result in the loss of more than one EDG.

For proper operation of the standby EDGs, it is necessary to ensure the proper quality of the fuel oil. Regulatory Guide 1.137 (Ref. 2) addresses the recommended fuel oil practices as supplemented by ANSI N195 (Ref. 3). The fuel oil properties governed by these SRs are the water and sediment content, the kinematic viscosity, specific gravity (or API gravity), and impurity level.

16-313, Part 16-29(b)

The EDG lubrication system is designed to provide sufficient lubrication to permit proper operation of its associated EDG under all loading conditions. The system is required to circulate the lube oil to the diesel engine working surfaces and to remove excess heat generated by friction during operation. Each engine's lube oil system contains an inventory capable of supporting a minimum of 7 days of operation. The auxiliary lube oil tank~~onsite storage~~ in addition to the engine oil sump is sufficient to ensure 7 days of continuous operation. This supply is sufficient to allow the operator to replenish lube oil from outside sources.

Each EDG has an air start system with adequate capacity for five successive start attempts on the EDG without recharging the air start receiver(s).

BASES

ACTIONS (continued)

F.1

With a Required Action and associated Completion Time not met, or one or more EDG's fuel oil, lube oil, or starting air subsystem not within limits for reasons other than addressed by Conditions A through E, the associated EDG may be incapable of performing its intended function and must be immediately declared inoperable.

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1

This SR provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each EDG's operation for 7 days at full load. The 7 day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an onsite or offsite location.

The 31 day Frequency is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.

16-313, Part 16-29(b)

SR 3.8.3.2

This Surveillance ensures that sufficient lube oil inventory is available ~~in the auxiliary makeup tank~~ to support at least 7 days of full load operation for each EDG. The 750 gallon requirement is based on the EDG manufacturer consumption values for the run time of the EDG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the EDG, when the EDG lube oil sump does not hold adequate inventory for 7 days of full load operation without the level reaching the manufacturer recommended minimum level.

A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since EDG starts and run time are closely monitored by the unit staff.

SR 3.8.3.3

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine