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10 CFR 50.4
10 CFR 50.71(e)
10 CFR 50.59

Serial: RA-19-0423
April 2, 2020

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Catawba Nuclear Station, Units 1 and 2
Docket Nos. 50-413 and 50-414,
Renewed License Nos. NPF-35 and NPF-52

Subject: **Submittal of Updated Final Safety Analysis Report (Revision 21), Technical Specification Bases Revisions, UFSAR/Selected Licensee Commitment Changes, and 10 CFR 50.59 Evaluation Summary Report**

Ladies and Gentlemen:

Pursuant to 10 CFR 50.71(e), Duke Energy Carolinas, LLC (Duke Energy) hereby submits Revision 21 to the Updated Final Safety Analysis Report (UFSAR) for the Catawba Nuclear Station (CNS), Units 1 and 2. In accordance with 10 CFR 50.71(e)(4), this UFSAR revision is being submitted within six months following the most recent refueling outage, which concluded on October 9, 2019. The CNS UFSAR is included in this submission via two CD-ROMs (Enclosures 1 and 2). Enclosure 1 provides a copy of the UFSAR that has been redacted for public use. Enclosure 2 provides a copy of the UFSAR that contains sensitive information to be withheld from public disclosure per 10 CFR 2.390(d)(1). Changes made since Revision 20 are identified by vertical lines in the margins of the pages that are indicated as Revision 21.

In accordance with 10 CFR 50.59(d)(2), Duke Energy is provide a report summarizing the 10 CFR 50.59 evaluations of changes, tests, and experiments implemented during the period from May 10, 2018 to February 1, 2020 for CNS. This report is included in Enclosure 3.

Pursuant to 10 CFR 50.4, Duke Energy is providing the CNS Technical Specification Bases changes that were made according to the provisions of Technical Specification 5.5.14, "Technical Specifications (TS) Bases Control Program." Enclosure 4 contains the TS Bases Insertion/Removal Instructions, the TS List of Effective Pages (LOEP) and Bases Replacement Pages.

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Additionally, in accordance with 10 CFR 50.71(e), Duke Energy is providing the changes made to the CNS Selected Licensee Commitments (SLC) Manual since December 4, 2018. These changes are located in Enclosure 5. The CNS SLC manual constitutes Chapter 16 of the UFSAR.

There are no regulatory commitments contained in this letter.

If you have any questions regarding this submittal, please contact Art Zaremba, Fleet Licensing Manager, at (980) 373-2062.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on April 2, 2020.

Sincerely,

Tom Simril

Tom Simril
Vice President, Catawba Nuclear Station

Enclosure:
1. Catawba Nuclear Station Updated Final Safety Analysis Report 2019 Update - Rev 21 Redacted Version, CD (Public Use Only)
2. Catawba Nuclear Station Updated Final Safety Analysis Report 2019 Update - Rev 21 CD (Non-Public Use)
3. Catawba Nuclear Station 10 CFR 50.59 Evaluation Summary Report
4. Catawba Nuclear Station Technical Specification (TS) Bases Changes
5. Catawba Nuclear Station Selected Licensee Commitments (SLC) Manual Changes

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U.S. Nuclear Regulatory Commission
RA-19-0423
April 2, 2020

Enclosure 1

Catawba Nuclear Station
Updated Final Safety Analysis Report 2019 Update - Rev 21 Redacted Version, CD
(Publicly Available Information)

U.S. Nuclear Regulatory Commission
RA-19-0423
April 2, 2020

Enclosure 2

Catawba Nuclear Station
Updated Final Safety Analysis Report 2019 Update - Rev 21 CD
(Non-Publicly Available Information)

Enclosure 3

Catawba Nuclear Station
10 CFR 50.59 Evaluation Summary Report

Summary of 10 CFR 50.59 Evalutions

Title:
C1R24 CNS Digital ECs

Documentation Number(s):
Action Request (AR) 02213061

Brief Description:
A set of updates to Catawba Nuclear Station (CNS) UFSAR Section15.4.8.3 and Tables 15-14, 15-26, and 15-41 have been prepared. The updates are based on a revision to the Alternative Source Terms (AST) analysis of the CNS rod ejection accident (REA). Most of the changes in this revised analysis and associated updates to the UFSAR are described elsewhere. All of the changes in the AST analysis of the REA and associated UFSAR updates lie within the scope of 10 CFR 50.59. All of these changes except two "screen out" from the requirements of an evaluation pursuant to 10 CFR 50.59 as input changes. The remaining two changes in the revised AST analysis of the REA were screened to determine that they are changes to the method of the AST analysis of the REA as approved by the NRC. These changes are evaluated here pursuant to 10 CFR 50.59 to determine whether either it is a departure from this method. The industry guidelines for completing 10 CFR 50.59 evaluation are used to make this determination. These guidelines have been endorsed by the NRC and put into effect within Duke Energy Corporation.

This activity consists of the following two changes:
- Addition of an external constituent into the post-REA control room dose.
- Accounting for partitioning of alkali metals and bromine in the SGs with moisture carryover

This activity is assessed as a change to an element of a method of AST analysis of the REA and not as an input to it. For this reason, the responses to Questions 1 - 7 are brief. The response to Question 8 includes the basis for concluding that this activity is not a departure from a method of the method of AST analysis as approved for implementation at CNS.

From this evalution it is concluded that the change can be implemented under 10CFR 50.59 without prior approval from the NRC.

Summary of 10 CFR 50.59 Evalutions

Title:
CNS Unit 1 Turbine Trip and Feedwater System Pipe Break

Documentation Number(s):
Action Request (AR) 02236975

Brief Description:
The proposed activities are revisions to DPC-NE-3002-A for changes in the turbine trip event (UFSAR 15.2.3) and the feedwater system pipe break event (UFSAR 15.2.8). UFSAR changes will be addressed by other activities. As part of the process to ensure these changes need no prior Nuclear Regulatory Commission (NRC) review and approval, an evaluation per Title 10, Part 50, Section 59 of the Code of Federal Regulations (10 CFR 50.59) is performed. These activities arise from revisions to the respective underlying AD-EG-ALL-1117 calculations.

From this evalution it is concluded that the change can be implemented under 10CFR 50.59 without prior approval from the NRC.

Summary of 10 CFR 50.59 Evalutions

Title:
UFSAR 15.4.7 Revision to Core Verification

Documentation Number(s):
Action Request (AR) 02245001
PT/0/A/4150/022, total Core Reloading
PT/0/A/4550/003 Core Verification

Brief Description:

The evaluation is assessing a change the CNS UFSAR, and ultimately site procedures, to allow core verification to be performed in a different manner than is currently described in Chapter 15.4.7, Inadvertent Loading and Operation of a Fuel Assembly in an Improper Position. The current wording states "Following core loading, the fuel assembly identification numbers are again checked as final assurance that the core has been loaded properly." The new wording would replace this sentence with, "During core loading, the identification number will be checked before each assembly is moved into the core. During or immediately following core loading, the fuel assembly identification numbers (read during movement or after placement) are checked against the core loading diagram as final assurance that the core has been loaded properly." This allows the site to perform core verification in a manner that takes credit for the controls put in place while an assembly is being moved and the cameras being used to validate final position. Since the new method still performs core verification, the likelihood of the misload accident doesn't increase. The consequences of the accident remain the same since the assumptions are still bounding. No SSCs important to safety are directly affected such that a malfunction occurs that would increase the probability or consequences of an accident, nor does the activity impact previously established results of a malfunction. No new accidents are created as a result of this change. No fission product barrier limits or methodologies are affected by this change. Therefore, a License Amendment Request is not warranted.
From this evalution it is concluded that the change can be implemented under 10CFR 50.59 without prior approval from the NRC.

Summary of 10 CFR 50.59 Evalutions

Title:
Reactor Coolant Pump Operation

Documentation Number(s):
Action Request (AR) 02301678
OP/1/A/6150/002 A Rev 72

Brief Description:

Add Option to Enclosure 4.3 (Filling and Draining of the NC Pump Standpipes) to allow for use of the flowpath around 1NC-56B.

Steps are being added to OP/1/A/6150/002 A to fill the NC Standpipes using 1NC-104, 1NC-215, and a hose between the valves. This change is being made due to 1NC56B (RMW Pump Disch Cont Isol) being inoperable. AR 02301224 documents that 1NC56B is unable to be opened from the Control Room. 1NC56B must be opened to fill the NC Pump standpipes. With this valve unable to be opened, an alternate path is desired in order to make up to the standpipes. This flow path will consist of connecting a hose between 1NC104 (Rx M/U Water Storage Tank Pumps to Pzr Relief Tank Test Vent) and 1NC215 (Pzr Relief Tank Spray Supply Line Test Connection). Both valves are in the Auxiliary Building in the CA pump room. 1NC215 is a safety related manual valve which is located within Containment Penetration M216. From this evalution it is concluded that the change can be implemented under 10CFR 50.59 without prior approval from the NRC.

Enclosure 4

Catawba Nuclear Station
Technical Specification (TS) Bases Changes

Removal and insertion instructions for Catawba Nuclear Station Technical Specification Bases Changes for October 31, 2018 thru February 1, 2020.

REMOVE THESE PAGES		INSERT THESE PAGES
	LIST OF EFFECTIVE PAGES	
Pages 1-18 Revision 20 (10/23/18)		Pages 1-19 Revision 27 (11/11/19)
	TECHNICAL SPECIFICATIONS BASES	
	TAB B 3.0	
B 3.0-1 thru 21 Revision 6		B 3.0-1 thru 21 Revision 7
	TAB B 3.6	
B 3.6.10-1 thru 6 Revision 3		B 3.6.10-1 thru 6 Revision 4
B 3.6.17-1 Revision 1		B 3.6.17-1 Revision 2
B 3.6.17-2 Revision 0		B 3.6.17-2 Revision 1
	TAB B 3.7	
B 3.7.8-1 thru 8 Revision 5		B 3.7.8-1 thru 11 Revision 8
B 3.7.10-1 thru 9 Revision 11		B 3.7.10-1 thru 9 Revision 13
B 3.7.11-1 thru 4 Revision 3		B 3.7.11-1 thru 4 Revision 4
B 3.7.12-1 thru 7 Revision 8		B 3.7.12-1 thru 7 Revision 10
B. 3.7.13-1 thru 5 Revision 5		B 3.7.13-1 thru 5 Revision 6
	TAB B 3.8	
B 3.8.1-1 thru 30 Revision 6		B 3.8.1-1 thru 39 Revision 7

B 3.8.2-1 thru 3 Revision 0	B 3.8.2-1 thru 3 Revision 3
B 3.8.2-4 Revision 1	B 3.8.2-4 Revision 3
B 3.8.2-5 Revision 2	B 3.8.2-5 Revision 3
B 3.8.2-6 Revision 1	B 3.8.2-6 Revision 3

TAB B 3.9

B 3.9.3-1 thru 5 Revision 4	B 3.9.3-1 thru 5 Revision 5

Catawba Nuclear Station Technical Specifications
List of Effective Pages

Page Number	Amendments	Revision Date
i	177/169	4/08/99
ii	219/214	3/01/05
iii	215/209	6/21/04
iv	173/165	9/30/98
1.1-1	173/165	9/30/98
1.1-2	268/264	6/25/12
1.1-3	299/295	10/23/18
1.1-4	268/264	6/25/12
1.1-5	281/277	4/29/16
1.1-6	268/264	6/25/12
1.1.7	179/171	8/13/99
1.2-1	173/165	9/30/98
1.2-2	173/165	9/30/98
1.2-3	173/165	9/30/98
1.3-1	298/294	2/1/18
1.3-2	298/294	2/1/18
1.3-3	298/294	2/1/18
1.3-4	298/294	2/1/18
1.3-5	298/294	2/1/18
1.3-6	298/294	2/1/18
1.3-7	298/294	2/1/18
1.3-8	298/294	2/1/18
1.3-9	298/294	2/1/18
1.3-10	298/294	2/1/18
1.3-11	298/294	2/1/18
1.3-12	298/294	2/1/18
1.3-13	298/294	2/1/18
1.3-14	298/294	2/1/18
1.4-1	173/165	9/30/98
1.4-2	173/165	9/30/98

1.4-3	173/165	9/30/98
1.4-4	173/165	9/30/98
2.0-1	210/204	12/19/03
3.0-1	288/284	4/26/17
3.0-2	298/294	2/1/18
3.0-3	235/231	3/19/07
3.0-4	288/284	4/26/17
3.0-5	298/294	2/1/18
3.0-6	235/231	3/19/07
3.1.1-1	263/259	3/29/11
3.1.2-1	296/292	10/23/17
3.1.2-2	263/259	3/29/11
3.1.3-1	173/165	9/30/98
3.1.3-2	275/271	04/14/15
3.1.3-3	173/165	9/30/98
3.1.4-1	173/165	9/30/98
3.1.4-2	173/165	9/30/98
3.1.4-3	263/259	3/29/11
3.1.4-4	263/259	3/29/11
3.1.5-1	173/165	9/30/98
3.1.5-2	263/259	3/29/11
3.1.6-1	173/165	9/30/98
3.1.6-2	173/165	9/30/98
3.1.6-3	263/259	3/29/11
3.1.7-1	173/165	9/30/98
3.1.7-2	173/165	9/30/98
3.1.8-1	291/287	7/26/17
3.1.8-2	263/259	3/29/11
3.2.1-1	173/165	9/30/98
3.2.1-2	173/165	9/30/98
3.2.1-3	263/259	3/29/11
3.2.1-4	263/259	3/29/11
3.2.1-5	263/259	3/29/11
3.2.2-1	173/165	9/30/98

3.2.2-2	173/165	9/30/98
3.2.2-3	263/259	3/29/11
3.2.2-4	263/259	3/29/11
3.2.3-1	263/259	3/29/11
3.2.4-1	173/165	9/30/98
3.2.4-2	173/165	9/30/98
3.2.4-3	173/165	9/30/98
3.2.4-4	263/259	3/29/11
3.3.1-1	173/165	9/30/98
3.3.1-2	247/240	12/30/08
3.3.1-3	247/240	12/30/08
3.3.1-4	207/201	7/29/03
3.3.1-5	247/240	12/30/08
3.3.1-6	247/240	12/30/08
3.3.1-7	247/240	12/30/08
3.3.1-8	173/165	9/30/98
3.3.1-9	263/259	3/29/11
3.3.1-10	263/259	3/29/11
3.3.1-11	263/259	3/29/11
3.3.1-12	278/274	4/08/16
3.3.1-13	263/259	3/29/11
3.3.1-14	263/259	3/29/11
3.3.1-15	263/259	3/29/11
3.3.1-16	278/274	4/08/16
3.3.1-17	263/259	3/29/11
3.3.1-18	263/259	3/29/11
3.3.1-19	278/274	4/08/16
3.3.1-20	263/259	3/29/11
3.3.1-21	263/259	3/29/11
3.3.1-22	263/259	3/29/11
3.3.2-1	173/165	9/30/98
3.3.2-2	247/240	12/30/08
3.3.2-3	247/240	12/30/08
3.3.2-4	247/240	12/30/08

3.3.2-5	264/260	6/13/11
3.3.2-6	264/260	6/13/11
3.3.2-7	249/243	4/2/09
3.3.2-8	249/243	4/2/09
3.3.2-9	249/243	4/2/09
3.3.2-10	263/259	3/29/11
3.3.2-11	263/259	3/29/11
3.3.2-12	263/259	3/29/11
3.3.2-13	277/273	12/18/15
3.3.2-14	277/273	12/18/15
3.3.2-15	277/273	12/18/15
3.3.2-16	277/273	12/18/15
3.3.2-17	277/273	12/18/15
3.3.2-18 (new)	277/273	12/18/15
3.3.3-1	219/214	3/1/05
3.3.3-2	219/214	3/1/05
3.3.3-3	263/259	3/29/11
3.3.3-4	219/214	3/1/05
3.3.4-1	213/207	4/29/04
3.3.4-2	263/259	3/29/11
3.3.4-3	272/268	2/27/14
3.3.5-1	173/165	9/30/98
3.3.5-2	277/273	12/18/15
3.3.6-1	196/189	3/20/02
3.3.6-2	263/259	3/29/11
3.3.6-3	196/189	3/20/02
3.3.9-1	207/201	7/29/03
3.3.9-2	207/201	7/29/03
3.3.9-3	263/259	3/29/11
3.3.9-4	263/259	3/29/11
3.4.1-1	210/204	12/19/03
3.4.1-2	210/204	12/19/03
3.4.1-3	263/259	3/29/11
3.4.1-4	283/279	6/02/16

3.4.1-5 (deleted)	184/176	3/01/00
3.4.1-6 (deleted)	184/176	3/01/00
3.4.2-1	173/165	9/30/98
3.4.3-1	173/165	9/30/98
3.4.3-2	263/259	3/29/11
3.4.3-3	281/277	4/29/16
3.4.3-4	212/206	3/4/04
3.4.3-5	281/277	4/29/16
3.4.3-6	212/206	3/4/04
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3.4.5-1	207/201	7/29/03
3.4.5-2	207/201	7/29/03
3.4.5-3	263/259	3/29/11
3.4.6-1	212/206	3/4/04
3.4.6-2	263/259	3/29/11
3.4.6-3	282/278	4/26/17
3.4.7-1	212/206	3/4/04
3.4.7-2	263/259	3/29/11
3.4.7-3	282/278	4/26/17
3.4.8-1	207/201	7/29/03
3.4.8-2	282/278	4/26/17
3.4.9-1	173/165	9/30/98
3.4.9-2	263/259	3/29/11
3.4.10-1	294/290	10/23/17
3.4.10-2	299/295	10/23/18
3.4-11-1	213/207	4/29/04
3.4.11-2	173/165	9/30/98
3.4.11-3	263/259	3/29/11
3.4.11-4	263/259	3/29/11
3.4.12-1	212/206	3/4/04
3.4.12-2	213/207	4/29/04
3.4.12-3	212/206	3/4/04
3.4.12-4	212/206	3/4/04
3.4.12-5	263/259	3/29/11

3.4.12-6	263/259	3/29/11
3.4.12-7	263/259	3/29/11
3.4.12-8	263/259	3/29/11
3.4.13-1	267/263	3/12/12
3.4.13-2	267/263	3/12/12
3.4.14-1	173/165	9/30/98
3.4.14-2	173/165	9/30/98
3.4.14-3	299/295	10/23/18
3.4.14-4	263/259	3/29/11
3.4.15-1	234/230	9/30/06
3.4.15-2	234/230	9/30/06
3.4.15-3	234/230	9/30/06
3.4.15-4	263/259	3/29/11
3.4.16-1	268/264	6/25/12
3.4.16-2	268/264	6/25/12
3.4.16-3(deleted)	268/264	6/25/12
3.4.16-4(deleted)	268/264	6/25/12
3.4.17-1	263/259	3/29/11
3.4.18-1	280/276	4/26/16
3.4.18-2	280/276	4/26/16
3.5.1-1	211/205	12/23/03
3.5.1-2	263/259	3/29/11
3.5.1-3	263/259	3/29/11
3.5.2-1	253/248	10/30/09
3.5.2-2	299/295	10/23/18
3.5.2-3	263/259	3/29/11
3.5.3-1	213/207	4/29/04
3.5.3-2	173/165	9/30/98
3.5.4-1	173/165	9/30/98
3.5.4-2	269/265	7/25/12
3.5.5-1	173/165	9/30/98
3.5.5-2	263/259	3/29/11
3.6.1-1	173/165	9/30/98
3.6.1-2	192/184	7/31/01

3.6.2-1	173/165	9/30/98
3.6.2-2	173/165	9/30/98
3.6.2-3	173/165	9/30/98
3.6.2-4	173/165	9/30/98
3.6.2-5	263/259	3/29/11
3.6.3-1	173/165	9/30/98
3.6.3-2	290/286	7/21/17
3.6.3-3	290/286	7/21/17
3.6.3-4	290/286	7/21/17
3.6.3-5	263/259	3/29/11
3.6.3-6	299/295	10/23/18
3.6.3-7	192/184	7/31/01
3.6.4-1	263/259	3/29/11
3.6.5-1	173/165	9/30/98
3.6.5-2	263/259	3/29/11
3.6.6-1	282/278	4/26/17
3.6.6-2	299/295	10/23/18
3.6.8-1	213/207	4/29/04
3.6.8-2	263/259	3/29/11
3.6.9-1	253/248	10/30/09
3.6.9-2	263/259	3/29/11
3.6.10-1	301/297	4/18/19
3.6.10-2	289/285	5/08/17
3.6.11-1	263/259	3/29/11
3.6.11-2	263/259	3/29/11
3.6.12-1	263/259	3/29/11
3.6.12-2	263/259	3/29/11
3.6.12-3	263/259	3/29/11
3.6.13-1	256/251	6/28/10
3.6.13-2	263/259	3/29/11
3.6.13-3	263/259	3/29/11
3.6.14-1	173/165	9/30/98
3.6.14-2	263/259	3/29/11
3.6.14-3	270/266	8/6/13

3.6.15-1	173/165	9/30/98
3.6.15-2	263/259	3/29/11
3.6.16-1	263/259	3/29/11
3.6.16-2	263/259	3/29/11
3.6.17-1	253/248	10/30/09
3.7.1-1	173/165	9/30/98
3.7.1-2	299/295	10/23/18
3.7.1-3	281/277	4/29/16
3.7.2-1	173/165	9/30/98
3.7.2-2	299/295	10/23/18
3.7.3-1	173/165	9/30/98
3.7.3-2	299/295	10/23/18
3.7.4-1	294/290	10/23/17
3.7.4-2	263/259	3/29/11
3.7.5-1	295/291	10/23/17
3.7.5-2	173/165	9/30/98
3.7.5-3	299/295	10/23/18
3.7.5-4	263/259	3/29/11
3.7.6-1	294/290	10/23/17
3.7.6-2	263/259	3/29/11
3.7.7-1	253/248	10/30/09
3.7.7-2	263/259	3/29/11
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3.8.1-11	263/259	3/29/11
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3.8.4-5	262/258	12/20/10
3.8.5-1	173/165	9/30/98
3.8.5-2	207/201	7/29/03
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3.8.9-1	173/165	9/30/98
3.8.9-2	173/165	9/30/98
3.8.9-3	263/259	3/29/11
3.8.10-1	207/201	7/29/03
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B 3.6.1-1 thru B 3.6.1-5	Revision 1	7/31/01

B 3.6.2-1 thru B 3.6.2-8	Revision 2	5/05/11
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B 3.6.10-1 thru B 3.6.10-6	Revision 4	7/15/19
B 3.6.11-1 thru B 3.6.11-6	Revision 5	5/05/11
B 3.6.12-1 thru B 3.6.12-11	Revision 5	5/05/11
B 3.6.13-1 thru B 3.6.13-9	Revision 4	5/05/11
B 3.6.14-1 thru B 3.6.14-5	Revision 2	4/11/14
B 3.6.15-1 thru B 3.6.15-4	Revision 1	5/05/11
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B 3.7.6-1 thru B 3.7.6-3	Revision 6	9/10/18
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B 3.7.9-1 thru B 3.7.9-4	Revision 3	5/05/11
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B 3.7.12-1 thru B 3.7.12-7	Revision 10	11/11/19
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B 3.7.14-1 thru B 3.7.14-3	Revision 2	5/05/11
B 3.7.15-1 thru B 3.7.15-4	Revision 2	5/05/11
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B 3.8.1-1 thru B.3.8.1-39	Revision 7	11/11/19
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B 3.8.6-1 thru B 3.8.6-7	Revision 4	5/05/11
B 3.8.7-1 thru B 3.8.7-4	Revision 3	5/05/11
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B 3.9.1-1 thru B 3.9.1-4	Revision 3	5/05/11
B 3.9.2-1 thru B 3.9.2-3	Revision 6	3/21/17
B 3.9.3-1 thru B 3.9.3-5	Revision 5	7/15/19
B 3.9.4-1 thru B 3.9.4-6	Revision 6	1/23/18
B 3.9.5-1 thru B 3.9.5-5	Revision 6	1/23/18
B 3.9.6-1 thru B 3.9.6-3	Revision 2	5/05/11

B 3.9.7-1 thru B 3.9.7-3	Revision 1	5/05/11

B 3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

BASES

LCOs

LCO 3.0.1 through LCO 3.0.10 establish the general requirements applicable to all Specifications and apply at all times, unless otherwise stated.

LCO 3.0.1

LCO 3.0.1 establishes the Applicability statement within each individual Specification as the requirement for when the LCO is required to be met (i.e., when the unit is in the MODES or other specified conditions of the Applicability statement of each Specification).

LCO 3.0.2

LCO 3.0.2 establishes that upon discovery of a failure to meet an LCO, the associated ACTIONS shall be met. The Completion Time of each Required Action for an ACTIONS Condition is applicable from the point in time that an ACTIONS Condition is entered, unless otherwise specified. The Required Actions establish those remedial measures that must be taken within specified Completion Times when the requirements of an LCO are not met. This Specification establishes that:

a. Completion of the Required Actions within the specified Completion Times constitutes compliance with a Specification; and

b. Completion of the Required Actions is not required when an LCO is met within the specified Completion Time, unless otherwise specified.

There are two basic types of Required Actions. The first type of Required Action specifies a time limit in which the LCO must be met. This time limit is the Completion Time to restore an inoperable system or component to OPERABLE status or to restore variables to within specified limits. If this type of Required Action is not completed within the specified Completion Time, a shutdown may be required to place the unit in a MODE or condition in which the Specification is not applicable. (Whether stated as a Required Action or not, correction of the entered Condition is an action that may always be considered upon entering ACTIONS.) The second type of Required Action specifies the remedial measures that permit continued operation of the unit that is not further restricted by the Completion Time. In this case, compliance with the Required Actions provides an acceptable level of safety for continued operation.

BASES

LCO 3.0.2 (continued)

Completing the Required Actions is not required when an LCO is met or is no longer applicable, unless otherwise stated in the individual Specifications.

The nature of some Required Actions of some Conditions necessitates that, once the Condition is entered, the Required Actions must be completed even though the associated Conditions no longer exist. The individual LCO's ACTIONS specify the Required Actions where this is the case. An example of this is in LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits."

The Completion Times of the Required Actions are also applicable when a system or component is removed from service intentionally. The ACTIONS for not meeting a single LCO adequately manage any increase in plant risk, provided any unusual external conditions (e.g., severe weather, offsite power instability) are considered. In addition, the increased risk associated with simultaneous removal of multiple structures, systems, trains or components from service is assessed and managed in accordance with 10 CFR 50.65(a)(4). Individual Specifications may specify a time limit for performing an SR when equipment is removed from service or bypassed for testing. In this case, the Completion Times of the Required Actions are applicable when this time limit expires, if the equipment remains removed from service or bypassed.

When a change in MODE or other specified condition is required to comply with Required Actions, the unit may enter a MODE or other specified condition in which another Specification becomes applicable. In this case, the Completion Times of the associated Required Actions would apply from the point in time that the new Specification becomes applicable, and the ACTIONS Condition(s) are entered.

LCO 3.0.3

LCO 3.0.3 establishes the actions that must be implemented when an LCO is not met and:

a. An associated Required Action and Completion Time is not met and no other Condition applies; or

b. The condition of the unit is not specifically addressed by the associated ACTIONS. This means that no combination of Conditions stated in the ACTIONS can be made that exactly corresponds to the actual condition of the unit. Sometimes, possible combinations of Conditions are such that entering LCO 3.0.3 is warranted; in such cases, the ACTIONS specifically state a Condition corresponding to such combinations and also that LCO 3.0.3 be entered immediately.

This Specification delineates the time limits for placing the unit in a safe MODE or other specified condition when operation cannot be maintained within the limits for safe operation as defined by the LCO and its ACTIONS. Planned entry into LCO 3.0.3 should be avoided. If it is not practicable to avoid planned entry into LCO 3.0.3, plant risk should be assessed and managed in accordance with 10 CFR 50.65(a)(4), and the planned entry into LCO 3.0.3 should have less effect on plant safety than other practicable alternatives.

Upon entering LCO 3.0.3, 1 hour is allowed to prepare for an orderly shutdown before initiating a change in unit operation. This includes time to permit the operator to coordinate the reduction in electrical generation with the load dispatcher to ensure the stability and availability of the electrical grid. The LCO phrase, "Action shall be initiated within 1 hour..." does not mean that an actual change in load must be commenced by the end of the 1-hour period (Reference 1). The action initiated at the end of the 1-hour period may be administrative in nature, such as preparing shutdown procedures. If at the end of 1 hour, corrective measures which would allow exiting LCO 3.0.3 are not complete, but there is reasonable assurance that they will be completed with enough time remaining to still allow for an orderly unit shutdown, if required, commencing a load decrease may be delayed until that time. The time limits specified to enter lower MODES of operation permit the shutdown to proceed in a controlled and orderly manner that is well within the specified maximum cooldown rate and within the capabilities of the unit, assuming that only the minimum required equipment is OPERABLE. This reduces thermal stresses on components of the Reactor Coolant System and the potential for a plant upset that could challenge safety systems under conditions to which this Specification applies. The use and interpretation of specified times to complete the actions of LCO 3.0.3 are consistent with the discussion of Section 1.3, Completion Times.

BASES

LCO 3.0.3 (continued)

A unit shutdown required in accordance with LCO 3.0.3 may be terminated and LCO 3.0.3 exited if any of the following occurs:

a. The LCO is now met,

b. The LCO is no longer applicable,

c. A Condition exists for which the Required Actions have now been performed, or

d. ACTIONS exist that do not have expired Completion Times. These Completion Times are applicable from the point in time that the Condition is initially entered and not from the time LCO 3.0.3 is exited.

The time limits of Specification 3.0.3 allow 37 hours for the unit to be in MODE 5 when a shutdown is required during MODE 1 operation. If the unit is in a lower MODE of operation when a shutdown is required, the time limit for entering the next lower MODE applies. If a lower MODE is entered in less time than allowed, however, the total allowable time to enter MODE 5, or other applicable MODE, is not reduced. For example, if MODE 3 is entered in 2 hours, then the time allowed for entering MODE 4 is the next 11 hours, because the total time for entering MODE 4 is not reduced from the allowable limit of 13 hours. Therefore, if remedial measures are completed that would permit a return to MODE 1, a penalty is not incurred by having to enter a lower MODE of operation in less than the total time allowed.

In MODES 1, 2, 3, and 4, LCO 3.0.3 provides actions for Conditions not covered in other Specifications. The requirements of LCO 3.0.3 do not apply in MODES 5 and 6 because the unit is already in the most restrictive Condition required by LCO 3.0.3. The requirements of LCO 3.0.3 do not apply in other specified conditions of the Applicability (unless in MODE 1, 2, 3, or 4) because the ACTIONS of individual Specifications sufficiently define the remedial measures to be taken.

BASES

LCO 3.0.3 (continued)

Exceptions to LCO 3.0.3 are provided in instances where requiring a unit shutdown, in accordance with LCO 3.0.3, would not provide appropriate remedial measures for the associated condition of the unit. An example of this is in LCO 3.7.14, "Spent Fuel Pool (SFP) Water Level." LCO 3.7.14 has an Applicability of "During movement of irradiated fuel assemblies in the spent fuel pool." Therefore, this LCO can be applicable in any or all MODES. If the LCO and the Required Actions of LCO 3.7.14 are not met while in MODE 1, 2, or 3, there is no safety benefit to be gained by placing the unit in a shutdown condition. The Required Action of LCO 3.7.14 of "Suspend movement of irradiated fuel assemblies in the spent fuel pool" is the appropriate Required Action to complete in lieu of the actions of LCO 3.0.3. These exceptions are addressed in the individual Specifications.

LCO 3.0.4

LCO 3.0.4 establishes limitations on changes in MODES or other specified conditions in the Applicability when an LCO is not met. It allows placing the unit in a MODE or other specified condition stated in that Applicability (e.g., the Applicability desired to be entered) when unit conditions are such that the requirements of the LCO would not be met, in accordance with either LCO 3.0.4.a, LCO 3.0.4.b, or LCO 3.0.4.c.

LCO 3.0.4.a allows entry into a MODE or other specified condition in the Applicability with the LCO not met when the associated ACTIONS to be entered following entry into the MODE or other specified condition in the Applicability will permit continued operation within the MODE or other specified condition for an unlimited period of time. Compliance with ACTIONS that permit continued operation of the unit for an unlimited period of time in a MODE or other specified condition provides an acceptable level of safety for continued operation. This is without regard to the status of the unit before or after the MODE change. Therefore, in such cases, entry into a MODE or other specified condition in the Applicability may be made and the Required Actions followed after entry into the Applicability.

For example, LCO 3.0.4.a may be used when the Required Action to be entered states that an inoperable instrument channel must be placed in the trip condition within the Completion Time. Transition into a MODE or other specified condition in the Applicability may be made in accordance with LCO 3.0.4 and the channel is subsequently placed in the tripped condition within the Completion Time, which begins when the Applicability is entered. If the instrument channel cannot be placed in the tripped condition and the subsequent default ACTION ("Required Action and associated Completion Time not met") allows the OPERABLE train to be placed in operation, use of LCO 3.0.4.a is acceptable because the subsequent ACTIONS to be entered following entry into the MODE

BASES

LCO 3.0.4 (continued)

include ACTIONS (place the OPERABLE train in operation) that permit safe plant operation for an unlimited period of time in the MODE or other specified condition to be entered.

LCO 3.0.4.b allows entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate

The risk assessment may use quantitative, qualitative, or blended approaches, and the risk assessment will be conducted using the plant program, procedures, and criteria in place to implement 10 CFR 50.65(a)(4), which requires that risk impacts of maintenance activities be assessed and managed. The risk assessment, for the purposes of LCO 3.0.4.b, must take into account all inoperable Technical Specification equipment regardless of whether the equipment is included in the normal 10 CFR 50.65(a)(4) risk assessment scope. The risk assessments will be conducted using the procedures and guidance endorsed by Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants." Regulatory Guide 1.182 endorses the guidance in Section 11 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." These documents address general guidance for conduct of the risk assessment, quantitative and qualitative guidelines for establishing risk management actions, and example risk management actions. These include actions to plan and conduct other activities in a manner that controls overall risk, increased risk awareness by shift and management personnel, actions to reduce the duration of the condition, actions to minimize the magnitude of risk increases (establishment of backup success paths or compensatory measures), and determination that the proposed MODE change is acceptable. Consideration should also be given to the probability of completing restoration such that the requirements of the LCO would be met prior to the expiration of ACTIONS Completion Times that would require exiting the Applicability.

LCO 3.0.4.b may be used with single, or multiple systems and components unavailable. NUMARC 93-01 provides guidance relative to consideration of simultaneous unavailability of multiple systems and components.

The results of the risk assessment shall be considered in determining the acceptability of entering the MODE or other specified condition in the Applicability, and any corresponding risk management actions. The LCO3.0.4.b risk assessments do not have to be documented.

LCO 3.0.4 (continued)

The Technical Specifications allow continued operation with equipment unavailable in MODE 1 for the duration of the Completion Time. Since this is allowable, and since in general the risk impact in that particular MODE bounds the risk of transitioning into and through the applicable MODES or other specified conditions in the Applicability of the LCO, the use of the LCO 3.0.4.b allowance should be generally acceptable, as long as the risk is assessed and managed as stated above. However, there is a small subset of systems and components that have been determined to be more important to risk and use of the LCO 3.0.4.b allowance is prohibited. The LCOs governing these systems and components contain Notes prohibiting the use of LCO 3.0.4.b by stating that LCO 3.0.4.b is not applicable.

LCO 3.0.4.c allows entry into a MODE or other specified condition in the Applicability with the LCO not met based on a Note in the Specification which states LCO 3.0.4.c is applicable. These specific allowances permit entry into MODES or other specified conditions in the Applicability when the associated ACTIONS to be entered do not provide for continued operation for an unlimited period of time and a risk assessment has not been performed. This allowance may apply to all the ACTIONS or to a specific Required Action of a Specification. The risk assessments performed to justify the use of LCO 3.0.4.b usually only consider systems and components. For this reason, LCO 3.0.4.c is typically applied to Specifications which describe values and parameters (e.g., RCS Specific Activity).

The provisions of this Specification should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components to OPERABLE status before entering an associated MODE or other specified condition in the Applicability.

The provisions of LCO 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS. In addition, the provisions of LCO 3.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that result from any unit shutdown. In this context, a unit shutdown is defined as a change in MODE or other specified condition in the Applicability associated with transitioning from MODE 1 to MODE 2, MODE 2 to MODE 3, MODE 3 to MODE 4, and MODE 4 to MODE 5.

BASES

LCO 3.0.4 (continued)

Upon entry into a MODE or other specified condition in the Applicability with the LCO not met, LCO 3.0.1 and LCO 3.0.2 require entry into the applicable Conditions and Required Actions until the condition is resolved, until the LCO is met, or until the unit is not within the Applicability of the Technical Specification.

Surveillances do not have to be performed on the associated inoperable equipment (or on variables outside the specified limits), as permitted by SR 3.0.1. Therefore, utilizing LCO 3.0.4 is not a violation of SR 3.0.1 or SR 3.0.4 for any Surveillances that have not been performed on inoperable equipment. However, SRs must be met to ensure OPERABILITY prior to declaring the associated equipment OPERABLE (or variable within limits) and restoring compliance with the affected LCO.

LCO 3.0.5

LCO 3.0.5 establishes the allowance for restoring equipment to service under administrative controls when it has been removed from service or declared inoperable to comply with ACTIONS. The sole purpose of this Specification is to provide an exception to LCO 3.0.2 (e.g., to not comply with the applicable Required Action(s)) to allow the performance of SRs to demonstrate:

a. The OPERABILITY of the equipment being returned to service; or

b. The OPERABILITY of other equipment.

The administrative controls ensure the time the equipment is returned to service in conflict with the requirements of the ACTIONS is limited to the time absolutely necessary to perform the allowed SRs. This Specification does not provide time to perform any other preventive or corrective maintenance. .LCO 3.0.5 should not be used in lieu of other practicable alternatives that comply with Required Actions and that do not require changing the MODE or other specified conditions in the Applicability in order to demonstrate equipment is OPERABLE. LCO 3.0.5 is not intended to be used repeatedly.

An example of demonstrating equipment is OPERABLE with the Required Actions not met is opening a manual valve that was closed to comply with Required Actions to isolate a flowpath with excessive Reactor Coolant System {RCS) Pressure Isolation Valve {PIV) leakage in order to perform testing to demonstrate that RCS PIV leakage is now within limit.

Examples of demonstrating equipment OPERABILITY include instances in which it is necessary to take an inoperable channel or trip system out of a tripped condition that was directed by a Required Action, if there is

BASES

LCO 3.0.5 (continued)

no Required Action Note for this purpose. An example of verifying OPERABILITY of equipment removed from service is taking a tripped channel out of the tripped condition to permit the logic to function and indicate the appropriate response during performance of required testing on the inoperable channel. Examples of demonstrating the OPERABILITY of other equipment are taking an inoperable channel or trip system out of the tripped condition 1) to prevent the trip function from occurring during the performance of required testing on another channel in the other trip system, or 2) to permit the logic to function and indicate the appropriate response during the performance of required testing on another channel in the same trip system.

The administrative controls in LCO 3.0.5 apply in all cases to systems or components in Chapter 3 of the Technical Specifications, as long as the testing could not be conducted while complying with the Required Actions. This includes the realignment or repositioning of redundant or alternate equipment or trains previously manipulated to comply with ACTIONS, as well as equipment removed from service or declared inoperable to comply with ACTIONS.

LCO 3.0.6

LCO 3.0.6 establishes an exception to LCO 3.0.2 for support systems that have an LCO specified in the Technical Specifications (TS). This exception is provided because LCO 3.0.2 would require that the Conditions and Required Actions of the associated inoperable supported system LCO be entered solely due to the inoperability of the support system. This exception is justified because the actions that are required to ensure the unit is maintained in a safe condition are specified in the support system LCO's Required Actions. These Required Actions may include entering the supported system's Conditions and Required Actions or may specify other Required Actions.

When a support system is inoperable and there is an LCO specified for it in the TS, the supported system(s) are required to be declared inoperable if determined to be inoperable as a result of the support system inoperability. However, it is not necessary to enter into the supported systems' Conditions and Required Actions unless directed to do so by the support system's Required Actions. The potential confusion and inconsistency of requirements related to the entry into multiple support and supported systems' LCOs' Conditions and Required Actions are eliminated by providing all the actions that are necessary to ensure the unit is maintained in a safe condition in the support system's Required Actions.

BASES

LCO 3.0.6 (continued)

However, there are instances where a support system's Required Action may either direct a supported system to be declared inoperable or direct entry into Conditions and Required Actions for the supported system. This may occur immediately or after some specified delay to perform some other Required Action. Regardless of whether it is immediate or after some delay, when a support system's Required Action directs a supported system to be declared inoperable or directs entry into Conditions and Required Actions for a supported system, the applicable Conditions and Required Actions shall be entered in accordance with LCO 3.0.2.

Specification 5.5.15, "Safety Function Determination Program (SFDP)," ensures loss of safety function is detected and appropriate actions are taken. Upon entry into LCO 3.0.6, an evaluation shall be made to determine if loss of safety function exists. Additionally, other limitations, remedial actions, or compensatory actions may be identified as a result of the support system inoperability and corresponding exception to entering supported system Conditions and Required Actions. The SFDP implements the requirements of LCO 3.0.6.

Cross train checks to identify a loss of safety function for those support systems that support multiple and redundant safety systems are required. The cross train check verifies that the supported systems of the redundant OPERABLE support system are OPERABLE, thereby ensuring safety function is retained. If this evaluation determines that a loss of safety function exists, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

LCO 3.0.7

There are certain special tests and operations required to be performed at various times over the life of the unit. These special tests and operations are necessary to demonstrate select unit performance characteristics, to perform special maintenance activities, and to perform special evolutions. Test Exception LCOs 3.1.8 and 3.4.17 allow specified Technical Specification (TS) requirements to be changed to permit performances of these special tests and operations, which otherwise could not be performed if required to comply with the requirements of these TS. Unless otherwise specified, all the other TS requirements remain unchanged. This will ensure all appropriate requirements of the MODE or other specified condition not directly associated with or required to be changed to perform the special test or operation will remain in effect.

BASES

LCO 3.0.7 (continued)

The Applicability of a Test Exception LCO represents a condition not necessarily in compliance with the normal requirements of the TS. Compliance with Test Exception LCOs is optional. A special operation may be performed either under the provisions of the appropriate Test Exception LCO or under the other applicable TS requirements. If it is desired to perform the special operation under the provisions of the Test Exception LCO, the requirements of the Test Exception LCO shall be followed.

LCO 3.0.8

LCO 3.0.8 establishes conditions under which systems are considered to remain capable of performing their intended safety function when associated snubbers are not capable of providing their associated support function(s). This LCO states that the supported system is not considered to be inoperable solely due to one or more required snubbers not capable of performing their associated support function(s). This is appropriate because a limited length of time is allowed for maintenance, testing, or repair of one or more required snubbers not capable of performing their associated support function(s) and appropriate compensatory measures are specified in the snubber requirements, which are located outside of the Technical Specifications (TS) under licensee control. The snubber requirements do not meet the criteria in 10 CFR 50.36(c)(2)(ii), and, as such, are appropriate for control by the licensee.

If the allowed time expires and the required snubber(s) are unable to perform their associated support function(s), the affected supported system's LCO(s) must be declared not met and the Conditions and Required Actions entered in accordance with LCO 3.0.2.

LCO 3.0.8.a applies when one or more required snubbers are not capable of providing their associated support function(s) to a single train or subsystem of a multiple train or subsystem supported system or to a single train or subsystem supported system. LCO 3.0.8.a allows 72 hours to restore the required snubber(s) before declaring the supported system inoperable. The 72 hour Completion Time is reasonable based on the low probability of a seismic event concurrent with an event that would require operation of the supported system occurring while the required snubber(s) are not capable of performing their associated support function and due to the availability of the redundant train of the supported system.

LCO 3.0.8.b applies when one or more required snubbers are not capable of providing their associated support function(s) to more than one train or subsystem of a multiple train or subsystem supported system. LCO 3.0.8.b allows 12 hours to restore the required snubber(s)

BASES

LCO 3.0.8 (continued)

before declaring the supported system inoperable. The 12 hour Completion Time is reasonable based on the low probability of a seismic event concurrent with an event that would require operation of the supported system occurring while the required snubber(s) are not capable of performing their associated support function.

LCO 3.0.8 requires that risk be assessed and managed. Industry and NRC guidance on the implementation of 10 CFR 50.65(a)(4) (the Maintenance Rule) does not address seismic risk. However, use of LCO 3.0.8 should be considered with respect to other plant maintenance activities, and integrated into the existing Maintenance Rule process to the extent possible so that maintenance on any unaffected train or subsystem is properly controlled, and emergent issues are properly addressed. The risk assessment need not be quantified, but may be a qualitative awareness of the vulnerability of systems and components when one or more required snubbers are not able to perform their associated support function.

LCO 3.0.9

LCO 3.0.9 delineates the applicability of each specification to Unit 1 and Unit 2 operations.

LCO 3.0.10

LCO 3.0.10 establishes conditions under which systems described in the Technical Specifications are considered to remain OPERABLE when required barriers are not capable of providing their related support function(s).

As stated in NEI 04-08, "Allowance for Non Technical Specification Barrier Degradation on Supported System OPERABILITY (TSTF-427) Industry Implementation Guidance," March 2006, if the inability of a barrier to perform its support function does not render a supported system governed by the Technical Specifications inoperable (see NRC Regulatory Issues Summary 2001-09, Control of Hazard Barriers, dated April 2, 2001), the provisions of LCO 3.0.10 are not necessary, as the supported system is Operable..

Barriers are doors, walls, floor plugs, curbs, hatches, installed structures or components, or other devices, not explicitly described in Technical Specifications, that support the performance of the safety function of systems described in the Technical Specifications. This LCO states that the supported system is not considered to be inoperable solely due to required barriers not capable of performing their related support function(s) under the described conditions. LCO 3.0.10 allows 30 days before declaring the supported system(s) inoperable and the LCO(s)

LCO 3.0.10 (continued)

associated with the supported system(s) not met. A maximum time is placed on each use of this allowance to ensure that as required barriers are found or are otherwise made unavailable, they are restored. However, the allowable duration may be less than the specified maximum time based on the risk assessment.

If the allowed time expires and the barriers are unable to perform their related support function(s), the supported system's LCO(s) must be declared not met and the Conditions and Required Actions entered in accordance with LCO 3.0.2.

This provision does not apply to barriers which support ventilation systems or to fire barriers. The Technical Specifications for ventilation systems provide specific Conditions for inoperable barriers. Fire barriers are addressed by other regulatory requirements and associated plant programs. This provision does not apply to barriers which are not required to support system OPERABILITY (see NRC Regulatory Issue Summary 2001-09, "Control of Hazard Barriers," dated April 2, 2001).

The provisions of LCO 3.0.10 are justified because of the low risk associated with required barriers not being capable of performing their related support function. This provision is based on consideration of the following initiating event categories:

- Loss of coolant accidents;
- High energy line breaks;
- Feedwater line breaks;
- Internal flooding;
- External flooding;
- Turbine missile ejection; and
- Tornado or high wind.

The risk impact of the barriers which cannot perform their related support function(s) must be addressed pursuant to the risk assessment and management provision of the Maintenance Rule, 10 CFR 50.65 (a)(4), and the associated implementation guidance, Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Regulatory Guide 1.160 endorses the guidance in Section 11 of NUMARC 93-01, Revision 4A, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." This guidance provides for the consideration of dynamic plant configuration issues, emergent conditions, and other aspects pertinent to plant operation with the barriers unable to perform their related support function(s). These considerations may result in risk management and other compensatory actions being required during the period that barriers are unable to perform their related support function(s).

BASES

LCO 3.0.10 (continued)

LCO 3.0.10 may be applied to one or more trains or subsystems of a system supported by barriers that cannot provide their related support function(s), provided that risk is assessed and managed (including consideration of the effects on Large Early Release and from external events). If applied concurrently to more than one train or subsystem of a multiple train or subsystem supported system, the barriers supporting each of these trains or subsystems must provide their related support function(s) for different categories of initiating events. For example, LCO 3.0.10 may be applied for up to 30 days for more than one train of a multiple train supported system if the affected barrier for one train protects against internal flooding and the affected barrier for the other train protects against tornado missiles. In this example, the affected barrier may be the same physical barrier but serve different protection functions for each train. If during the time that LCO 3.0.10 is being used, the required OPERABLE train or subsystem becomes inoperable, it must be restored to OPERABLE status within 24 hours. Otherwise, the train(s) or subsystem(s) supported by barriers that cannot perform their related support function(s) must be declared inoperable and the associated LCOs declared not met. This 24 hour period provides time to respond to emergent conditions that would otherwise likely lead to entry into LCO 3.0.3 and a rapid plant shutdown, which is not justified given the low probability of an initiating event which would require the barrier(s) not capable of performing their related support function(s). During this 24 hour period, the plant risk associated with the existing conditions is assessed and managed in accordance with 10 CFR 50.65(a)(4).

REFERENCES

1. Letter from Christopher I. Grimes, Chief, Technical Specifications Branch, Division of Operating Reactor Support, to Frederick J. Hebdon, Director, Project Directorate II-4, Division of Reactor Projects I/II, "Use of Shutdown Times for Corrective Maintenance (TIA 92-08)," December 11, 1992.

B 3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

BASES

SRs

SR 3.0.1 through SR 3.0.5 establish the general requirements applicable to all Specifications and apply at all times, unless otherwise stated. SR 3.0.2 and SR 3.0.3 apply in Chapter 5 only when invoked by a Chapter 5 Specification.

SR 3.0.1

SR 3.0.1 establishes the requirement that SRs must be met during the MODES or other specified conditions in the Applicability for which the requirements of the LCO apply, unless otherwise specified in the individual SRs. This Specification is to ensure that Surveillances are performed to verify the OPERABILITY of systems and components, and that variables are within specified limits. Failure to meet a Surveillance within the specified Frequency, in accordance with SR 3.0.2, constitutes a failure to meet an LCO.

Systems and components are assumed to be OPERABLE when the associated SRs have been met. Nothing in this Specification, however, is to be construed as implying that systems or components are OPERABLE when:

a. The systems or components are known to be inoperable, although still meeting the SRs; or

b. The requirements of the Surveillance(s) are known not to be met between required Surveillance performances.

Surveillances do not have to be performed when the unit is in a MODE or other specified condition for which the requirements of the associated LCO are not applicable, unless otherwise specified. The SRs associated with a test exception are only applicable when the test exception is used as an allowable exception to the requirements of a Specification.

Unplanned events may satisfy the requirements (including applicable acceptance criteria) for a given SR. In this case, the unplanned event may be credited as fulfilling the performance of the SR. This allowance includes those SRs whose performance is normally precluded in a given MODE or other specified condition.

SR 3.0.1 (continued)

Surveillances, including Surveillances invoked by Required Actions, do not have to be performed on inoperable equipment because the ACTIONS define the remedial measures that apply. Surveillances have to be met and performed in accordance with SR 3.0.2, prior to returning equipment to OPERABLE status.

Upon completion of maintenance, appropriate post maintenance testing is required to declare equipment OPERABLE. This includes ensuring applicable Surveillances are not failed and their most recent performance is in accordance with SR 3.0.2. Post maintenance testing may not be possible in the current MODE or other specified conditions in the Applicability due to the necessary unit parameters not having been established. In these situations, the equipment may be considered OPERABLE provided testing has been satisfactorily completed to the extent possible and the equipment is not otherwise believed to be incapable of performing its function. This will allow operation to proceed to a MODE or other specified condition where other necessary post maintenance tests can be completed.

SR 3.0.2

SR 3.0.2 establishes the requirements for meeting the specified Frequency for Surveillances and any Required Action with a Completion Time that requires the periodic performance of the Required Action on a "once per . . ." interval.

SR 3.0.2 permits a 25% extension of the interval specified in the Frequency. This extension facilitates Surveillance scheduling and considers plant operating conditions that may not be suitable for conducting the Surveillance (e.g., transient conditions or other ongoing Surveillance or maintenance activities).

When a Section 5.5, “Programs and Manuals,” specification states that the provisions of 3.0.2 are applicable, a 25% extension of the testing interval, whether stated in the specification or incorporated by reference, is permitted.

The 25% extension does not significantly degrade the reliability that results from performing the Surveillance at its specified Frequency. This is based on the recognition that the most probable result of any particular Surveillance being performed is the verification of conformance with the SRs.

The exceptions to SR 3.0.2 are those Surveillances for which the 25% extension of the interval specified in the Frequency does not apply. These exceptions are stated in the individual Specifications. The requirements of regulations take precedence over the TS. Examples of where SR 3.0.2 does not apply are the Containment Leakage Rate Testing Program required by 10 CFR 50, Appendix J, and the inservice testing of pumps and valves in accordance with applicable American Society of Mechanical Engineers Operation and Maintenance Code, as required by 10 CFR 50.55a. These programs establish testing requirements and Frequencies in accordance with the requirements of regulations. The TS cannot, in and of themselves, extend a test interval specified in the regulations directly or by reference.

As stated in SR 3.0.2, the 25% extension also does not apply to the initial portion of a periodic Completion Time that requires performance on a "once per ..." basis. The 25% extension applies to each performance after the initial performance. The initial performance of the Required Action, whether it is a particular Surveillance or some other remedial action, is considered a single action with a single Completion Time. One reason for not allowing the 25% extension to this Completion Time is that such an action usually verifies that no loss of function has occurred by checking the status of redundant or diverse components or the action accomplishes the function of the inoperable equipment in an alternative manner.

The provisions of SR 3.0.2 are not intended to be used repeatedly to extend Surveillance intervals (other than those consistent with refueling intervals) or periodic Completion Time intervals beyond those specified.

SR 3.0.3

SR 3.0.3 establishes the flexibility to defer declaring affected equipment inoperable or an affected variable outside the specified limits when a Surveillance has not been performed within the specified Frequency. A delay period of up to 24 hours or up to the limit of the specified Frequency, whichever is greater, applies from the point in time that it is discovered that the Surveillance has not been performed in accordance with SR 3.0.2, and not at the time that the specified Frequency was not met.

When a Section 5.5, “Programs and Manuals,” specification states that the provisions of SR 3.0.3 are applicable, it permits the flexibility to defer declaring the testing requirement not met in accordance with SR 3.0.3 when the testing has not been completed within the testing interval (including the allowance of SR 3.0.2 if invoked by the Section 5.5 specification).

This delay period provides adequate time to perform Surveillances that have been missed. This delay period permits the performance of a Surveillance before complying with Required Actions or other remedial measures that might preclude performance of the Surveillance.

The basis for this delay period includes consideration of unit conditions, adequate planning, availability of personnel, the time required to perform the Surveillance, the safety significance of the delay in completing the required Surveillance, and the recognition that the most probable result of any particular Surveillance being performed is the verification of conformance with the requirements.

When a Surveillance with a Frequency based not on time intervals, but upon specified unit conditions, operating situations, or requirements of regulations (e.g., prior to entering MODE 1 after each fuel loading, or in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, etc.) is discovered to not have been performed when specified, SR 3.0.3 allows for the full delay period of up to the specified Frequency to perform the Surveillance. However, since there is not a time interval specified, the missed Surveillance should be performed at the first reasonable opportunity.

SR 3.0.3 provides a time limit for, and allowances for the performance of, Surveillances that become applicable as a consequence of MODE changes imposed by Required Actions.

SR 3.0.3 is only applicable if there is a reasonable expectation the associated equipment is OPERABLE or that variables are within limits, and it is expected that the Surveillance will be met when performed. Many factors should be considered, such as the period of time since the Surveillance was last performed, or whether the Surveillance, or a portion thereof, has ever been performed, and any other indications, tests, or activities that might support the expectation that the Surveillance will be met when performed. An example of the use of SR 3.0.3 would be a relay contact that was not tested as required in accordance with a particular SR, but previous successful performances of the SR included the relay contact; the adjacent, physically connected relay contacts were tested during the SR performance; the subject relay contact has been tested by another SR; or historical operation of the subject relay contact has been successful. It is not sufficient to infer the behavior of the associated equipment from the performance of similar equipment. The rigor of determining whether there is a reasonable expectation a Surveillance will be met when performed should increase based on the length of time since the last performance of the Surveillance. If the Surveillance has been performed recently, a review of the Surveillance

SR 3.0.3 (continued)

history and equipment performance may be sufficient to support a reasonable expectation that the Surveillance will be met when performed. For Surveillances that have not been performed for a long period or that have never been performed, a rigorous evaluation based on objective evidence should provide a high degree of confidence that the equipment is OPERABLE. The evaluation should be documented in sufficient detail to allow a knowledgeable individual to understand the basis for the determination.

Failure to comply with specified Frequencies for SRs is expected to be an infrequent occurrence. Use of the delay period established by SR 3.0.3 is a flexibility which is not intended to be used repeatedly to extend Surveillance intervals. While up to 24 hours or the limit of the specified Frequency is provided to perform the missed Surveillance, it is expected that the missed Surveillance will be performed at the first reasonable opportunity. The determination of the first reasonable opportunity should include consideration of the impact on plant risk (from delaying the Surveillance as well as any plant configuration changes required or shutting the plant down to perform the Surveillance) and impact on any analysis assumptions, in addition to unit conditions, planning, availability of personnel, and the time required to perform the Surveillance. This risk impact should be managed through the program in place to implement 10 CFR 50.65(a)(4) and its implementation guidance, NRC Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants." This Regulatory Guide addresses consideration of temporary and aggregate risk impacts, determination of risk management action thresholds, and risk management action up to and including plant shutdown. The missed Surveillance should be treated as an emergent condition as discussed in the Regulatory Guide. The risk evaluation may use quantitative, qualitative, or blended methods. The

degree of depth and rigor of the evaluation should be commensurate with the importance of the component. Missed Surveillances for important components should be analyzed quantitatively. If the results of the risk evaluation determine the risk increase is significant, this evaluation should be used to determine the safest course of action. All missed Surveillances will be placed in the licensee's Corrective Action Program.

If a Surveillance is not completed within the allowed delay period, then the equipment is considered inoperable or the variable is considered outside the specified limits and the Completion Times of the Required Actions for the applicable LCO Conditions begin immediately upon expiration of the delay period. If a Surveillance is failed within the delay period, then the equipment is inoperable, or the variable is outside the specified limits and the Completion Times of the Required Actions for the

SR 3.0.3 (continued)

applicable LCO Conditions begin immediately upon the failure of the Surveillance.

Completion of the Surveillance within the delay period allowed by this Specification, or within the Completion Time of the ACTIONS, restores compliance with SR 3.0.1.

SR 3.0.4

SR 3.0.4 establishes the requirement that all applicable SRs must be met before entry into a MODE or other specified condition in the Applicability.

This Specification ensures that system and component OPERABILITY requirements and variable limits are met before entry into MODES or other specified conditions in the Applicability for which these systems and components ensure safe operation of the unit. The provisions of this Specification should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components to

OPERABLE status before entering an associated MODE or other specified condition in the Applicability.

A provision is included to allow entry into a MODE or other specified condition in the Applicability when an LCO is not met due to a Surveillance not being met in accordance with LCO 3.0.4.

However, in certain circumstances, failing to meet an SR will not result in SR 3.0.4 restricting a MODE change or other specified condition change. When a system, subsystem, division, component, device, or variable is inoperable or outside its specified limits, the associated SR(s) are not required to be performed, per SR 3.0.1, which states that surveillances do not have to be performed on inoperable equipment. When equipment is inoperable, SR 3.0.4 does not apply to the associated SR(s) since the requirement for the SR(s) to be performed is removed. Therefore, failing to perform the Surveillance(s) within the specified Frequency does not result in an SR 3.0.4 restriction to changing MODES or other specified conditions of the Applicability. However, since the LCO is not met in this instance, LCO 3.0.4 will govern any restrictions that may (or may not) apply to MODE or other specified condition changes. SR 3.0.4 does not restrict changing MODES or other specified conditions of the Applicability when a Surveillance has not been performed within the specified Frequency, provided the requirement to declare the LCO not met has been delayed in accordance with SR 3.0.3.

The provisions of SR 3.0.4 shall not prevent entry into MODES or other specified conditions in the Applicability that are required to comply with ACTIONS. In addition, the provisions of SR 3.0.4 shall not prevent

BASES

SR 3.0.4 (continued)

changes in MODES or other specified conditions in the Applicability that result from any unit shutdown. In this context, a unit shutdown is defined as a change in MODE or other specified condition in the Applicability associated with transitioning from MODE 1 to MODE 2, MODE 2 to MODE 3, MODE 3 to MODE 4, and MODE 4 to MODE 5.

The precise requirements for performance of SRs are specified such that exceptions to SR 3.0.4 are not necessary. The specific time frames and conditions necessary for meeting the SRs are specified in the Frequency, in the Surveillance, or both. This allows performance of Surveillances when the prerequisite condition(s) specified in a Surveillance procedure require entry into the MODE or other specified condition in the Applicability of the associated LCO prior to the performance or completion of a Surveillance. A Surveillance that could not be performed until after entering the LCO's Applicability, would have its Frequency specified such that it is not "due" until the specific conditions needed are met. Alternately, the Surveillance may be stated in the form of a Note, as not required (to be met or performed) until a particular event, condition, or time has been reached. Further discussion of the specific formats of SRs' annotation is found in Section 1.4, Frequency.

SR 3.0.5

SR 3.0.5 delineates the applicability of the surveillance activities to Unit 1 and Unit 2 operations.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.10 Annulus Ventilation System (AVS)

BASES

BACKGROUND

The AVS is required by 10 CFR 50, Appendix A, GDC 41, "Containment Atmosphere Cleanup" (Ref. 1), to ensure that radioactive materials that leak from the primary containment into the reactor building (secondary containment) following a Design Basis Accident (DBA) are filtered and adsorbed prior to exhausting to the environment.

The containment has a secondary containment called the reactor building, which is a concrete structure that surrounds the steel primary containment vessel. Between the containment vessel and the reactor building inner wall is an annulus that collects any containment leakage that may occur following a loss of coolant accident (LOCA) or rod ejection accident. This space also allows for periodic inspection of the outer surface of the steel containment vessel.

The AVS establishes a negative pressure in the annulus between the reactor building and the steel containment vessel. Filters in the system then control the release of radioactive contaminants to the environment.

The AVS consists of two separate and redundant trains. Each train includes a heater, prefilter/moisture separators, upstream and downstream high efficiency particulate air (HEPA) filters, an activated carbon adsorber section for removal of radioiodines, and a fan. Ductwork, valves and/or dampers, and instrumentation also form part of the system. The prefilters/moisture separators function to remove large particles and entrained water droplets from the airstream, which reduces the moisture content. A HEPA filter bank upstream of the carbon adsorber filter bank functions to remove particulates and a second bank of HEPA filters follow the adsorber section to collect carbon fines. Only the upstream HEPA filter and the carbon adsorber section are credited in the analysis.

A heater is included within each filter train to reduce the relative humidity of the airstream, although no credit is taken in the safety analysis. The heaters are not required for OPERABILITY since the carbon laboratory tests are performed at 95% relative humidity, but have been maintained in the system to provide additional margin (Ref. 6).

BASES

BACKGROUND (continued)

The heaters do not affect OPERABILITY of the AVS filter trains because carbon adsorber efficiency testing is performed at 30°C and 95% relative humidity. Testing per ASTM D3803-1989 at 30°C and 95% relative humidity ensures that the filter efficiency is unaffected by moisture. Periodic operation ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action.

The system initiates and maintains a negative air pressure in the reactor building annulus by means of filtered exhaust ventilation of the reactor building annulus following receipt of a safety injection (SI) signal. The system is described in Reference 2. The AVS reduces the radioactive content in the annulus atmosphere following a DBA. Loss of the AVS could cause site boundary doses, in the event of a DBA, to exceed the values given in the licensing basis.

APPLICABLE SAFETY ANALYSES

The AVS design basis is established by the consequences of the limiting DBA, which is a LOCA. The accident analysis (Ref. 3) assumes that only one train of the AVS is functional due to a single failure that disables the other train. The accident analysis accounts for the reduction in airborne radioactive material provided by the remaining one train of this filtration system. The amount of fission products available for release from containment is determined for a LOCA.

The modeled AVS actuation in the safety analyses is based upon a worst case response time following an SI initiated at the limiting setpoint. The CANVENT computer code is used to determine the total time required to achieve a negative pressure in the annulus under accident conditions. The response time considers signal delay, diesel generator startup and sequencing time, system startup time, and the time for the system to attain the required pressure.

The AVS satisfies Criterion 3 of 10 CFR 50.36 (Ref. 4).

LCO

In the event of a DBA, one AVS train is required to provide the minimum iodine removal assumed in the safety analysis. Two trains of the AVS must be OPERABLE to ensure that at least one train will operate, assuming that the other train is disabled by a single active failure.

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, a DBA could lead to fission product release to containment that leaks to the reactor building. The large break LOCA, on which this system's design is based, is a full power event. Less severe LOCAs and leakage still require the system to be OPERABLE throughout these MODES. The probability and severity of a LOCA decrease as core power and Reactor Coolant System pressure decrease. With the reactor shut down, the probability of release of radioactivity resulting from such an accident is low.

In MODES 5 and 6, the probability and consequences of a DBA are low due to the pressure and temperature limitations in these MODES. Under these conditions, the AVS is not required to be OPERABLE.

ACTIONS

A.1

With one AVS train inoperable, the inoperable train must be restored to OPERABLE status within 7 days. The 7 day Completion Time is based on consideration of such factors as the availability of the OPERABLE redundant AVS train and the low probability of a DBA occurring during this period. The Completion Time is adequate to make most repairs.

B.1 and B.2

If the AVS train cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.10.1

Operating each AVS train from the control room with flow through the HEPA filters and carbon adsorbers ensures that all trains are OPERABLE and that all associated controls are functioning properly. Operation for ≥ 15 continuous minutes demonstrates OPERABILITY of the system. Periodic operation ensures that blockage, fan or motor failure, or excessive vibration can be detected for correction action. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.6.10.2

This SR verifies that the required AVS filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The AVS filter tests are in accordance with Regulatory Guide 1.52 (Ref. 5). The VFTP includes testing HEPA filter performance, carbon adsorber efficiency, system flow rate, and the physical properties of the activated carbon (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.10.3

The automatic startup on a safety injection signal ensures that each AVS train responds properly. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.6.10.4

The AVS filter cooling electric motor-operated bypass valves are tested to verify OPERABILITY. The valves are normally closed and may need to be opened from the control room to initiate miniflow cooling through a filter unit that has been shutdown following a DBA LOCA. Miniflow cooling may be necessary to limit temperature increases in the idle filter train due to decay heat from captured fission products. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.6.10.5

The proper functioning of the fans, dampers, filters, adsorbers, etc., as a system is verified by the ability of each train to produce the required system flow rate. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.6.10.6

The ability of the AVS train to produce the required negative pressure of at least -0.88 inch water gauge when corrected to elevation 564 feet ensures that the annulus negative pressure is at least -0.25 inch water gauge everywhere in the annulus. The -0.88 inch water gauge annulus pressure includes a correction for an outside air temperature induced hydrostatic pressure gradient of -0.63 inch water gauge. The negative

BASES

SURVEILLANCE REQUIREMENTS (continued)

pressure prevents unfiltered leakage from the reactor building, since outside air will be drawn into the annulus by the negative pressure differential.

The CANVENT computer code is used to model the thermal effects of a LOCA on the annulus and the ability of the AVS to develop and maintain a negative pressure in the annulus after a design basis accident. The annulus pressure drawdown time during normal plant conditions is not an input to any dose analyses. Therefore, the annulus pressure drawdown time during normal plant conditions is insignificant.

The AVS trains are tested to ensure each train will function as required. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. Furthermore, the SR interval was developed considering that the AVS equipment OPERABILITY is demonstrated at a 31 day Frequency by SR 3.6.10.1. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 41.
2. UFSAR, Sections 6.2.3 and 9.4.9.
3. UFSAR, Chapter 15.
4. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
5. Regulatory Guide 1.52, Revision 2.
6. Catawba Nuclear Station License Amendments 90/84 for Units 1/2, August 23, 1991.
7. NUREG-0800, Sections 6.2.3 and 6.5.3, Rev. 2, July 1981.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.17 Containment Valve Injection Water System (CVIWS)

BASES

BACKGROUND

The CVIWS is required by 10 CFR 50, Appendix A, GDC 54, "Piping Systems Penetrating Containment" (Ref. 1), to ensure a water seal to a specific class of containment isolation valves (double disc gate valves) during a LOCA, to prevent leakage of containment atmosphere through the gate valves.

The CVIWS is designed to inject water between the two seating surfaces of double disc gate valves used for Containment isolation. The injection pressure is higher than Containment design peak pressure during a LOCA. This will prevent leakage of the Containment atmosphere through the gate valves, thereby reducing potential offsite dose below the values specified by 10 CFR 50.67 limits following the postulated accident.

During normal power operation, the system is in a standby mode and does not perform any function. During accident situations the CVIWS is activated to perform its safety related function, thus limiting the release of containment atmosphere past specific containment isolation valves, in order to mitigate the consequences of a LOCA. Containment isolation valves, for systems which are not used to mitigate the consequences of an accident, will be supplied with CVIWS seal water upon receipt of a Phase A isolation signal.

The system consists of two independent, redundant trains; one supplying gate valves that are powered by the A train diesel and the other supplying gate valves powered by the B train diesel. This separation of trains prevents the possibility of both containment isolation valves not sealing due to a single failure.

Each train consists of a surge chamber which is filled with water and pressurized with nitrogen. One main header exits the chamber and splits into several headers. A solenoid valve is located in the main header before any of the branch headers which will open after a 60 second delay on a Phase A isolation signal. Each of the headers supply injection water

BASES

BACKGROUND (continued)

to containment isolation valves located in the same general location, and close on the same engineered safety signal. The delay for the solenoid valves opening is to allow adequate time for the slowest gate valve to close, before water is injected into the valve seat.

Makeup water is provided from the Demineralized Water Storage Tank for testing and adding water to the surge chamber during normal plant operation. Assured water is provided from the essential header of the Nuclear Service Water System (NSWS). This supply is assured for at least 30 days following a postulated accident. If the water level in the surge chamber drops below the low-low level or if the surge chamber nitrogen pressure drops below the low-low pressure after a Phase A isolation signal, a solenoid valve in the supply line from the NSWS will automatically open and remains open, assuring makeup to the CVIWS at a pressure greater than 110% of peak Containment accident pressure.

Overpressure protection is provided to relieve the pressure buildup caused by the heatup of a trapped volume of incompressible fluid between two positively closing valves (due to containment temperature transient) back into containment where an open relief path exists.

APPLICABLE SAFETY ANALYSES

The CVIWS design basis is established by the consequences of the limiting DBA, which is a LOCA. The accident analysis (Ref. 2) assumes that only one train of the CVIWS is functional due to a single failure that disables the other train. Makeup water can be assured from the NSWS for 30 days following a postulated LOCA.

The CVIWS satisfies Criterion 3 of 10 CFR 50.36 (Ref. 3).

B 3.7 PLANT SYSTEMS

B 3.7.8 Nuclear Service Water System (NSWS)

BASES

BACKGROUND

The NSWS, including Lake Wylie and the Standby Nuclear Service Water Pond (SNSWP), provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation, and a normal shutdown, the NSWS also provides this function for various safety related and nonsafety related components. The safety related function is covered by this LCO.

The NSWS consists of two independent loops (A and B) of essential equipment, each of which is shared between units. Each loop contains two NSWS pumps, each of which is supplied from a separate emergency diesel generator. Each set of two pumps supplies two trains (1A and 2A, or 1B and 2B) of essential equipment through common discharge piping. While the pumps are unit designated, i.e., 1A, 1B, 2A, 2B, all pumps receive automatic start signals from a safety injection or blackout signal from either unit. Therefore, a pump designated to one unit will supply post accident cooling to equipment in that loop on both units, provided its associated emergency diesel generator is available. For example, the 1A NSWS pump, supplied by emergency diesel 1A, will supply post accident cooling to NSWS trains 1A and 2A.

One NSWS loop containing two OPERABLE NSWS pumps has sufficient capacity to supply post loss of coolant accident (LOCA) loads on one unit and shutdown and cooldown loads on the other unit. Thus, the OPERABILITY of two NSWS loops assures that no single failure will keep the system from performing the required safety function. Furthermore, one OPERABLE NSWS pump on each NSWS loop has sufficient capacity to supply post LOCA loads on one unit and shutdown and cooldown loads on the other unit. Additionally, one NSWS loop containing one OPERABLE NSWS pump has sufficient capacity to maintain one unit indefinitely in MODE 5 (commencing 36 hours following a trip from RTP) while supplying the post LOCA loads of the other unit. Thus, after a unit has been placed in MODE 5, only one NSWS pump and its associated emergency diesel generator are required to be OPERABLE on each loop, in order for the system to be capable of performing its required safety function, including single failure considerations.

BASES

BACKGROUND (continued)

Additional information about the design and operation of the NSWS, along with a list of the components served, is presented in the UFSAR, Section 9.2.1 (Ref. 1). The principal safety related function of the NSWS is the removal of decay heat from the reactor via the CCW System.

APPLICABLE SAFETY ANALYSES

The design basis of the NSWS is for one NSWS train, in conjunction with the CCW System and a containment spray system, to remove core decay heat following a design basis LOCA as discussed in the UFSAR, Section 6.2 (Ref. 2). This prevents the containment sump fluid from increasing in temperature during the recirculation phase following a LOCA and provides for a gradual reduction in the temperature of this fluid as it is supplied to the Reactor Coolant System by the ECCS pumps. The NSWS is designed to perform its function with a single failure of any active component, assuming the loss of offsite power.

The NSWS, in conjunction with the CCW System, also cools the unit from residual heat removal (RHR), as discussed in the UFSAR, Section 5.4 (Ref. 3), from RHR entry conditions to MODE 5 during normal and post accident operations. The time required for this evolution is a function of the number of CCW and RHR System trains that are operating. Thirty six hours after a trip from RTP, one NSWS train is sufficient to remove decay heat during subsequent operations in MODES 5 and 6. This assumes a maximum NSWS temperature, a simultaneous design basis event on the other unit, and the loss of offsite power.

The NSWS satisfies Criterion 3 of 10 CFR 50.36 (Ref. 4).

LCO

Two NSWS trains are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post accident heat loads, assuming that the worst case single active failure occurs coincident with the loss of offsite power.

While the NSWS is operating in the normal dual supply and discharge header alignment, an NSWS train is considered OPERABLE during MODES 1, 2, 3, and 4 when:

a. 1. Both NSWS pumps on the NSWS loop are OPERABLE; or

   2. One unit's NSWS pump is OPERABLE and one unit's

BASES

LCO (continued)

flowpath to the non essential header, AFW pumps, and Containment Spray heat exchangers are isolated (or equivalent flow restrictions); and

b. The associated piping, valves, and instrumentation and controls required to perform the safety related function are OPERABLE.

The NSWS system is shared between the two units. The shared portions of the system must be OPERABLE for each unit when that unit is in the MODE of Applicability. If a shared NSWS component becomes inoperable, then the Required Actions of this LCO must be entered independently for each unit that is in the MODE of applicability of the LCO, except as noted in a.2 above for operation in the normal dual supply header alignment. In this case, sufficient flow is available, however, this configuration results in inoperabilities within other required systems on one unit and the associated Required Actions must be entered. Use of a NSWS pump and associated diesel generator on a shutdown unit to support continued operation (> 72 hours) of a unit with an inoperable NSWS pump is prohibited. A shutdown unit supplying its associated emergency power source (1EMXG/2EMXH) cannot be credited for OPERABILITY of components supporting the operating unit.

APPLICABILITY

In MODES 1, 2, 3, and 4, the NSWS is a normally operating system that is required to support the OPERABILITY of the equipment serviced by the NSWS and required to be OPERABLE in these MODES.

In MODES 5 and 6, the requirements of the NSWS are determined by the systems it supports.

ACTIONS

A.1

Condition A is modified by a Note indicating that this Condition is not applicable while in Condition C of this LCO unless entry is directed by Note 2 of Condition C.

If one NSWS train is inoperable, action must be taken to restore OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE NSWS train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE NSWS train could result in loss of NSWS function. Due to the shared nature of the NSWS, both units are required to enter a 72 hour Action when a NSWS Train becomes inoperable on

BASES

ACTIONS (continued)

either unit. Required Action A.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," should be entered if an inoperable Condition B is modified by three Notes. Note 1 states that entry into this Condition shall only be allowed for pre-planned activities as described in the Bases of this Specification. Condition B is only allowed to be entered in support of planned maintenance or modification activities associated with the supply header that is taken out of service. An example of a situation for which entry into this Condition is allowed is refurbishment or inspection of a supply header. Entry into this Condition is not allowed in response to unplanned events or for other events involving the NSWS. Examples of situations for which entry into this Condition is prohibited are emergent repair of discovered piping leaks and other component failures. For unplanned events or other events involving the NSWS, Condition A must be entered. Note 2 requires immediate entry into Condition A of this LCO if one or more NSWS components become inoperable while in this Condition and one NSWS train remains OPERABLE. With one remaining OPERABLE NSWS train, the NSWS can still perform its safety related function. However, with one inoperable NSWS train, the NSWS cannot be assured of performing its safety related function in the event of a single failure of another NSWS component. The most limiting single failure is the failure of an NSWS pit to automatically transfer from Lake Wylie to the SNSWP during a seismic event. While the loss of any NSWS component subject to the requirements of this LCO can result in the entry into Condition A, the most common example is the inoperability of an NSWS pump. This occurs during periodic testing of the emergency diesel generators. Inoperability of an emergency diesel generator renders its associated NSWS pump inoperable. Note 3 requires immediate entry into LCO 3.0.3 if one or more NSWS components become inoperable while in this Condition and no NSWS train remains OPERABLE. In this case, the NSWS cannot perform its safety related function.

Operation of the NSWS in the single supply header alignment while in either the single Pond return header alignment or the single Auxiliary Building discharge header alignment at the same time is prohibited.

C.1

While the NSWS is operating in the single Auxiliary Building discharge header alignment, one of the Unit 2 Auxiliary Building discharge headers is removed from service in support of planned maintenance or modification activities associated with the Auxiliary Building discharge header that is taken out of service. In this configuration, the

BASES

ACTIONS (continued)

corresponding (train related) Unit 1 NSWS train is inoperable and the required NSWS flow to safety related equipment is discharged through the remaining OPERABLE NSWS Auxiliary Building discharge header.

When in the single Auxiliary Building discharge header alignment with the NSWS Train A discharge header inoperable, the NSWS piping between valves 1RNP19 and 1RN63A is isolated.

Likewise, when in the single Auxiliary Building discharge header alignment with the NSWS Train B discharge header inoperable, the NSWS piping between valves 1RNP20 and 1RN58B is isolated.

Operation of the NSWS in the single Auxiliary Building discharge header alignment while in either the single supply header alignment or the single Pond return header alignment at the same time is prohibited.

If one NSWS train is inoperable due to the NSWS being aligned for single Auxiliary Building discharge header operation, the NSWS train must be restored to OPERABLE status within 14 days. Dual Auxiliary Building discharge header operation is the normal alignment of the NSWS. The Completion Time of 14 days is supported by probabilistic risk analysis. While in Condition C, the single Auxiliary Building discharge header is adequate to perform the heat removal function for all required safety related equipment for its respective safety train. Due to the design of the NSWS, only the operating unit is required to enter this Condition when the NSWS is aligned for single Auxiliary Building discharge header operation. Pre-planned activities requiring entry into this Condition are only performed with Unit 2 in an outage (MODE 5, 6, or defueled).

Condition C is modified by three Notes. Note 1 states that entry into this Condition shall only be allowed for Unit 1 and for pre-planned activities as described in the Bases of this Specification. Condition C is only allowed to be entered in support of planned maintenance or modification activities associated with the Auxiliary Building discharge header that is taken out of service. An example of a situation for which entry into this Condition is allowed is refurbishment or inspection of an Auxiliary Building discharge header. Entry into this Condition is not allowed in response to unplanned events or for other events involving the NSWS. Examples of situations for which entry into this Condition is prohibited are emergent repair of discovered piping leaks and other component failures. For unplanned events or other events involving the NSWS, Condition A must be entered. In addition, Note 1 states that entry into this Condition shall not be allowed while Unit 2 is in MODE 1, 2, 3, or 4. Entry into this Condition is

BASES

ACTIONS (continued)

only allowed while the LCO is not applicable to Unit 2. Note 2 requires immediate entry into Condition A of this LCO if one or more Unit 1 required NSWS components become inoperable while in this Condition and one NSWS train remains OPERABLE. With one remaining OPERABLE NSWS train, the NSWS can still perform its safety related function. However, with one inoperable NSWS train, the NSWS cannot be assured of performing its safety related function in the event of a single failure of another NSWS component. While the loss of any NSWS component subject to the requirements of this LCO can result in the entry into Condition A, the most common example is the inoperability of an NSWS pump. This occurs during periodic testing of the emergency diesel generators. Inoperability of an emergency diesel generator renders its associated NSWS pump inoperable. Note 3 requires immediate entry into LCO 3.0.3 if one or more Unit 1 required NSWS components become inoperable while in this Condition and no NSWS train remains OPERABLE. In this case, the NSWS cannot perform its safety related function.

D.1

While the NSWS is operating in the single Pond return header alignment, one of the shared discharge headers from the Aux Bldg to the SNSWP is removed from service in support of planned maintenance or modification activities associated with the Pond return header that is taken out of service. In this configuration, each NSWS train is considered OPERABLE with the required NSWS flow path from safety related equipment through the remaining OPERABLE NSWS Pond return header. The technical justification for the NSWS single Pond return header alignment demonstrates that the NSWS can meet all design flow requirements in response to all design basis accidents. The utilization of the single pond return header has been analyzed in the PRA risk based assessment with no significant increase in risk. While the NSWS is operating in the single Pond return header alignment, an NSWS train is considered OPERABLE during MODES 1, 2, 3, and 4 when:

a. Both NSWS pumps on the NSWS loop are OPERABLE; and

b. The associated piping (except for the Pond return header that is taken out of service), valves, and instrumentation and controls required to perform the safety related function are OPERABLE.

When in the single Pond return header alignment with the NSWS Train A Pond return header inoperable, the NSWS piping downstream of valves 1RN63A and 1(2)RN846A is isolated. Valve 1RNP20 is locked open,

BASES

ACTIONS (continued)

1RN58B is open with power removed, and 1(2)RN848B are open with power removed to protect against closing that would isolate the discharge flow from both trains.

Similarly, when in the single Pond return header alignment with the NSWS Train B Pond return header inoperable, the NSWS piping downstream of valves 1RN58B and 1(2)RN848B is isolated. In this case valve 1RNP19 is locked open, 1RN63A is open with power removed, and 1(2)RN846A are open with power removed to protect against closing that would isolate the discharge flow from both trains.

When in the single Pond return header alignment the NSWS System is aligned to the SNSWP, with power removed from pit isolation valves 1RN3A and 1RN4B, to preclude a single active failure that could result in the complete loss of one NSWS pit (two NSWS pumps). Aux Bldg discharge crossover piping valves 1RN53B and 1RN54A are open with power removed to allow both Aux Bldg trains to discharge through one header. Similarly, Unit 1 and Unit 2 diesel generator (DG) crossover valves 1(2)RNP08 and 1(2)RNP09 are locked open to allow both trains of DGs to discharge through one header on each unit. Finally, both Unit 1 and Unit 2 NSWS non-essential headers are isolated.

Operation of the NSWS in the single Pond return header alignment while in either the single supply header alignment or the single Auxiliary Building discharge header alignment at the same time is prohibited.

If one NSWS Pond return header is inoperable due to the NSWS being aligned for single Pond return header operation, the NSWS Pond return header must be restored to OPERABLE status within 30 days. The Completion Time of 30 days is supported by probabilistic risk analysis. While in Condition D, the single Pond return header alignment is adequate to perform the heat removal function for all required safety related equipment for <u>both</u> safety trains of <u>both</u> units. Due to the shared nature of the NSWS, both units are required to enter this Condition when the NSWS is aligned for single Pond return header operation.

Condition D is modified by four Notes. Note 1 states that entry into this Condition shall only be allowed for pre-planned activities. Condition D is only allowed to be entered in support of planned maintenance or modification activities associated with the Pond return header that is taken out of service. An example of a situation for which entry into this Condition is allowed is refurbishment or inspection of a Pond return header. Entry into this Condition is not allowed in response to unplanned events or for other events involving the NSWS. Examples of situations for

BASES

ACTIONS (continued)

which entry into this Condition is prohibited are emergent repair of discovered piping leaks and other component failures. For unplanned events or other events involving the NSWS, Condition A must be entered. Note 2 requires immediate entry into Condition A of this LCO if one or more NSWS components become inoperable while in this Condition and one NSWS train remains OPERABLE. With one remaining OPERABLE NSWS train, the NSWS can still perform its safety related function. However, with one inoperable NSWS train, the NSWS cannot be assured of performing its safety related function in the event of a single failure of another NSWS component. While the loss of any NSWS component subject to the requirements of this LCO can result in the entry into Condition A, the most common example is the inoperability of an NSWS pump. This occurs during periodic testing of the emergency diesel generators. Inoperability of an emergency diesel generator renders its associated NSWS pump inoperable. Note 3 requires immediate entry into LCO 3.0.3 if one or more NSWS components become inoperable while in this Condition and no NSWS train remains OPERABLE. In this case, the NSWS cannot perform its safety related function. Note 4 states that entry into this Condition shall only be allowed for 60 days per 12-month period. This limitation of entry into this Condition is in agreement with inputs to the PRA risk based assessment for the NSWS alignment supporting operation in this Condition.

E.1 and E.2

If the NSWS train cannot be restored to OPERABLE status within the associated Completion Time, or if the NSWS single supply header, single Auxiliary Building discharge header, or single Pond return header cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

The following table identifies those actions committed to by Duke Energy in Letter CNS-17-014 dated September 14, 2017 for the approval of License Amendments 300 and 296 for Units 1 and 2, respectively.

BASES

ACTIONS (continued)

#	REGULATORY COMMITMENTS
1	The support system for the NSWS Discharge piping associated with Train 1A in the Auxiliary Building will be maintained such that stress levels are below the threshold for considering a pipe leak under the Pipe Rupture program. This ensures that for all sections where pipe ruptures are postulated that leaks can be isolated with the NSWS continuing to operate with adequate equipment to support shutdown of both units. Catawba NSWS piping stress calculations RNG, RNH, and RNE have been revised to indicate the requirement to maintain this low stress level.
2	To reduce stress at the 1A Component Cooling (KC) Heat Exchanger piping return nozzle location, a 1/4" thick reinforcing pad will be added to the existing reinforcing pad per a plant modification. The 1/4" reinforcing pad must be installed prior to entering NSWS Single Pond Return Header Operation.
3	NSWS Flow Balance testing will take place prior to entering Single Pond Return Header Operation. This will ensure the NSWS is capable of providing adequate cooling water flow to support LOCA loads on one unit, concurrent with the shutdown loads of the other unit - while assuming the most limiting single failure, which is loss of one DG and its associated NSWS Pump.

BASES

ACTIONS (continued)

The following table identifies additional considerations as addressed in the submittals by Duke Energy in Letter CNS-17-014 dated September 14, 2017 and in Letter RA-18-0097 dated August 17, 2018 for the approval of License Amendments 300 and 296 for Units 1 and 2, respectively.

#	ADDITIONAL CONSIDERATIONS
1	During the Completion Time of Condition D, planned or discretionary maintenance that renders one or more NSWS pumps and / or the associated DGs inoperable and unavailable on either train of NSWS is prohibited while in the Single Pond Return Header alignment with one exception. For the DGs, a monthly periodic test is performed to confirm operability. Prior to starting the DG, a "bar and roll" of the DG is performed. This renders the DG inoperable but available, and is allowed while the NSWS is aligned for Single Pond Return Header Operation.
2	The SSCs whose unavailability should be avoided during the Completion Time for Condition D include the following for the opposite train (i.e., opposite the train in the Completion Time, as applicable): • Nuclear Service Water System • Diesel Generators (DGs) • Component Cooling System • Auxiliary Feedwater System • Instrument Air System • Standby Shutdown Facility (SSF) • Residual Heat Removal System • 4160V AC Essential Power • Engineered Safeguards Features Actuation System • Switchyard Unit Tie Power Circuit Breakers

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

This SR is modified by a Note indicating that the isolation of the NSWS components or systems may render those components inoperable, but does not affect the OPERABILITY of the NSWS. Verifying the correct alignment for manual, power operated, and automatic valves in the NSWS flow path provides assurance that the proper flow paths exist for NSWS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

SURVEILLANCE REQUIREMENTS (continued)

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.8.2

This SR verifies proper automatic operation of the NSWS valves on an actual or simulated actuation signal. The signals that cause the actuation are from Safety Injection and Phase 'B' isolation. The NSWS is a normally operating system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note that states that the SR is not required to be met for valves that are maintained in position to support NSWS single supply header operation, single Auxiliary Building discharge header operation, or single Pond return header operation. When the NSWS is placed in this alignment, certain automatic valves in the system are maintained in position and will not automatically reposition in response to an actuation signal while the NSWS is in this alignment.

SR 3.7.8.3

This SR verifies proper automatic operation of the NSWS pumps on an actual or simulated actuation signal. The signals that cause the actuation are from Safety Injection and Loss of Offsite Power. The NSWS is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 9.2.
2. UFSAR, Section 6.2.
3. UFSAR, Section 5.4.
4. 10 CFR 50.36, Technical Specifications, (c)(2)(ii)

B 3.7 PLANT SYSTEMS

B 3.7.10 Control Room Area Ventilation System (CRAVS)

BASES

BACKGROUND

The CRAVS ensures that the Control Room Envelope (CRE) will remain habitable for occupants during and following all credible accident conditions. This function is accomplished by pressurizing the CRE to ≥ 1/8 (0.125) inch water gauge with respect to all surrounding areas, filtering the outside air used for pressurization, and filtering a portion of the return air from the CRE to clean up the control room environment.

The CRAVS consists of two independent, redundant trains of equipment. Each train consists of:

- a pressurizing filter train fan (1CRA-PFTF-1 or 2CRA-PFTF-1)
- a filter unit (1CRA-PFT-1 or 2CRA-PFT-1) which includes moisture separator/prefilters, HEPA filters, and carbon adsorbers
- the associated ductwork, dampers/valves, controls, doors, and barriers

Inherent in the CRAVS ability to pressurize the control room is the control room envelope boundary. The CRE is the area within the confines of the CRE boundary that contains the spaces that control room occupants inhabit to control the unit during normal and accident conditions. This area encompasses the control room, and may encompass the non-critical areas to which frequent personnel access or continuous occupancy is not necessary in the event of an accident. The CRE is protected during the normal operation, natural events, and accident conditions. The CRE boundary is the combination of walls, floor, roof, ducting, doors, penetrations and equipment that physically form the CRE. The OPERABILITY of the CRE boundary must be maintained to ensure that the inleakage of unfiltered air into the CRE will not exceed the inleakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to CRE occupants. The CRE and its boundary are defined in the Control Room Envelope Habitability Program. These boundaries must be intact or properly isolated for the CRAVS to function properly.

BASES

BACKGROUND (continued)

The CRAVS can be operated either manually or automatically. Key operated selector switches located in the CRE initiate operation of all train related CRAVS equipment. The selected train is in continuous operation. Outside air for pressurization and makeup to the CRE is supplied from two independent intakes. This outside air is mixed with return air from the CRE before being passed through the filter unit. In the filter unit, moisture separator/prefilters remove any large particles in the air, and any entrained water droplets present. A HEPA filter bank upstream of the carbon adsorber filter bank functions to remove particulates and a second bank of HEPA filters follow the carbon adsorber to collect carbon fines. Only the upstream HEPA filters and carbon adsorber bank are credited in the analysis. A heater is included within each filter train to reduce the relative humidity of the airstream, although no credit is taken in the safety analysis. The heaters are not required for OPERABILITY since the carbon laboratory tests are performed at 95% relative humidity, but have been maintained in the system to provide additional margin (Ref. 9). Testing per ASTM D3803-1989 at 30°C and 95% relative humidity ensures that the filter efficiency is unaffected by moisture. Periodic operation ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action.

Upon receipt of an Engineered Safety Feature (ESF) signal, the selected CRAVS train continues to operate and the pressurizing filter train fan of the non-selected train is started. This assures control room pressurization, assuming an active failure of one of the pressurizing filter train fans.

The outside air for pressurization is continuously monitored for the presence of smoke, radiation, or chlorine by non-safety related detectors. If smoke, radiation, or chlorine is detected in an outside air intake, an alarm is received within the CRE, alerting the operators of this condition. The operator will take the required action to close the affected intake, if necessary, per the guidance of the Annunciator Response Procedures.

A single CRAVS train is capable of pressurizing the CRE to greater than or equal to 0.125 inches water gauge. The CRAVS is designed in accordance with Seismic Category 1 requirements. The CRAVS operation in maintaining the CRE habitable is discussed in the UFSAR, Sections 6.4 and 9.4.1 (Refs. 1 and 2).

The CRAVS is designed to maintain a habitable environment in the CRE for 30 days of continuous occupancy after a DBA without exceeding a 5 rem total effective dose equivalent (TEDE).

BASES

APPLICABLE SAFETY ANALYSES

The CRAVS components are arranged in redundant, safety related ventilation trains. The CRAVS provides airborne radiological protection for the CRE occupants, as demonstrated by the CRE occupant dose analyses for the most limiting design basis loss of coolant accident, fission product release presented in the UFSAR, Chapter 15 (Ref. 3).

The CRAVS provides protection from smoke and hazardous chemicals to CRE occupants. The analysis of hazardous chemical releases demonstrates that the toxicity limits are not exceeded in the CRE following a hazardous chemical release (Ref. 1). The evaluation of a smoke challenge demonstrates that it will not result in the inability of the CRE occupants to control the reactor either from the control room or from the remote shutdown panels (Ref. 9).

The worst case single active failure of a component of the CRAVS, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

The CRAVS satisfies Criterion 3 of 10 CFR 50.36 (Ref. 4).

LCO

Two independent and redundant CRAVS trains are required to be OPERABLE to ensure that at least one is available assuming a single active failure disables the other train. Total system failure, such as from a loss of both ventilation trains or from an inoperable CRE boundary, could result in exceeding a dose of 5 rem to the CRE occupants in the event of a large radioactive release.

Each CRAVS train is considered OPERABLE when the individual components necessary to limit CRE occupant exposure are OPERABLE in both trains. A CRAVS train is OPERABLE when the associated:

a. Pressurizing filter train fan is OPERABLE;

b. HEPA filters and carbon adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; and

c. Ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.

In order for the CRAVS trains to be considered OPERABLE, the CRE boundary must be maintained such that the CRE occupant dose from a large radioactive release does not exceed the calculated dose in the licensing basis consequence analyses for DBAs, and that the CRE occupants are protected from hazardous chemicals and smoke.

BASES

LCO (continued)

The CRAVS is shared between the two units. The system must be OPERABLE for each unit when that unit is in the MODE of Applicability. A shutdown unit supplying its associated emergency power source (1EMXG/2EMXH) cannot be credited for OPERABILITY of components supporting the operating unit. If a CRAVS component becomes inoperable, then the Required Actions of this LCO must be entered independently for each unit that is in the MODE of Applicability of the LCO.

The LCO is modified by a Note allowing the CRE boundary to be opened intermittently under administrative controls. This Note only applies to openings in the CRE boundary that can be rapidly restored to the design condition, such as doors, hatches, floor plugs, and access panels. For entry and exit through doors, the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls should be proceduralized and consist of stationing a dedicated individual at the opening who is in continuous communication with the operators in the CRE. This individual will have a method to rapidly close the opening and to restore the CRE boundary to a condition equivalent to the design condition when a need for CRE isolation is indicated.

APPLICABILITY

In MODES 1, 2, 3, 4, 5, and 6, the CRAVS must be OPERABLE to ensure that the CRE will remain habitable during and following a DBA.

During movement of irradiated fuel assemblies, the CRAVS must be OPERABLE to cope with the release from a fuel handling accident.

ACTIONS

A.1

When one CRAVS train is inoperable for reasons other than an inoperable CRE boundary, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CRAVS train is adequate to perform the CRE protection function. However, the overall reliability is reduced because a single failure in the OPERABLE CRAVS train could result in loss of CRAVS function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability.

BASES

ACTIONS (continued)

B.1, B.2, and B.3

If the unfiltered inleakage of potentially contaminated air past the CRE boundary and into the CRE can result in CRE occupant radiological dose greater than the calculated dose of the licensing basis analyses of DBA consequences (allowed to be up to 5 rem TEDE), or inadequate protection of CRE occupants from hazardous chemicals or smoke, the CRE boundary is inoperable. Actions must be taken to restore an OPERABLE CRE boundary within 90 days.

During the period that the CRE boundary is considered inoperable, action must be initiated to implement mitigating actions to lessen the effect on CRE occupants from the potential hazards of a radiological or chemical event or a challenge from smoke. Actions must be taken within 24 hours to verify that in the event of a DBA, the mitigating actions will ensure that CRE occupant radiological exposures will not exceed the calculated dose of the licensing basis analyses of DBA consequences, and that CRE occupants are protected from hazardous chemicals and smoke. These mitigating actions (i.e., actions that are taken to offset the consequences of the inoperable CRE boundary) should be preplanned for implementation upon entry into the condition, regardless of whether entry is intentional or unintentional. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90 day Completion Time is reasonable based on the determination that the mitigating actions will ensure protection of CRE occupants within analyzed limits while limiting the probability that CRE occupants will have to implement protective measures that may adversely affect their ability to control the reactor and maintain it in a safe shutdown condition in the event of a DBA. In addition, the 90 day Completion Time is reasonable time to diagnose, plan and possibly repair, and test most problems with the CRE boundary.

C.1 and C.2

In MODE 1, 2, 3, or 4, if the inoperable CRAVS or CRE boundary train cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

ACTIONS (continued)

D.1

In MODE 5 or 6, if the inoperable CRAVS train cannot be restored to OPERABLE status within the required Completion Time, or during movement of irradiated fuel assemblies, action must be taken to immediately place the OPERABLE CRAVS train in operation. This action ensures that the operating (or running) train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure would be readily detected.

An alternative to Required Action D.1 is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

E.1

In MODE 5 or 6, or during movement of irradiated fuel assemblies, with two CRAVS trains inoperable, or with one or more CRAVS trains inoperable due to an inoperable CRE boundary, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

F.1

If both CRAVS trains are inoperable in MODE 1, 2, 3, or 4, for reasons other than Condition B, the CRAVS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not too severe, testing each train once every month provides an adequate check of this system. Operation for ≥ 15 continuous minutes demonstrates OPERABILITY of the system. Periodic operation ensures that blockage, fan or motor failure, or excessive vibration can be detected for correction action. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.10.2

This SR verifies that the required CRAVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CRAVS filter tests are in accordance with Regulatory Guide 1.52 (Ref. 5). The VFTP includes testing the performance of the HEPA filter and carbon adsorber efficiencies and the physical properties of the activated carbon. Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.10.3

This SR verifies that each CRAVS train starts and operates on an actual or simulated actuation signal. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.10.4

This SR verifies the OPERABILITY of the CRE boundary by testing for unfiltered air inleakage past the CRE boundary and into the CRE. The details of the testing are specified in the Control Room Envelope Habitability Program.

The CRE is considered habitable when the radiological dose to CRE occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem TEDE and the CRE occupants are protected from hazardous chemicals and smoke. This SR verifies that the unfiltered air inleakage into the CRE is no greater than the flow rate assumed in the licensing basis analyses of DBA consequences. When unfiltered air inleakage is greater than the assumed flow rate, Condition B must be entered. Required Action B.3 allows time to restore the CRE boundary to OPERABLE status provided mitigating actions can ensure that the CRE remains within the licensing basis habitability limits for the occupants following an accident. Compensatory measures are discussed in Regulatory Guide 1.196, Section C.2.7.3 (Ref. 9), which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 7). These compensatory measures may also be used as mitigating actions as required by Required Action B.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 8). Options for restoring the CRE boundary to OPERABLE status include changing the licensing basis DBA consequence analysis, repairing the CRE boundary, or a combination of these actions. Depending upon the nature of the problem and the corrective action, a full scope inleakage test may not be necessary to establish that the CRE boundary has been restored to OPERABLE status.

REFERENCES

1. UFSAR, Section 6.4.
2. UFSAR, Section 9.4.1.
3. UFSAR, Chapter 15.
4. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
5. Regulatory Guide 1.52, Rev. 2.
6. Catawba Nuclear Station License Amendments 90/84 for Units 1/2, August 23, 1991.

REFERENCES (continued)

7. NEI 99-03, "Control Room Habitability Assessment", June 2001.

8. Letter from Eric J. Leeds (NRC) to James W. Davis (NEI) dated January 30, 2004, "NEI Draft White Paper, Use of Generic Letter 91-18 Process and Alternative Source Terms in the Context of Control Room Habitability", (ADAMS Accession No. ML040300694).

9. Regulatory Guide 1.196, Rev. 1.

B 3.7 PLANT SYSTEMS

B 3.7.11 Control Room Area Chilled Water System (CRACWS)

BASES

BACKGROUND

The CRACWS provides temperature control for the control room and the control room area.

The CRACWS consists of two independent and redundant trains that provide cooling to the control room and control room area. Each train consists of a chiller package, chilled water pump, and air handling units with cooling coils. Chilled water is passed through the cooling coils of the air handling unit to cool the air. Electric duct heaters are then used to control the supply air temperature.

The CRACWS provides both normal and emergency cooling to the control room and control room area. A single train will provide the required temperature control to maintain the control room approximately 74°F. The CRACWS operation in maintaining the control room temperature is discussed in the UFSAR, Section 9.4 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The design basis of the CRACWS is to maintain the control room temperature for 30 days of continuous occupancy.

The CRACWS components are arranged in redundant, safety related trains. During emergency operation, the CRACWS maintains the temperature between 72°F and 85°F. A single active failure of a component of the CRACWS, with a loss of offsite power, does not impair the ability of the system to perform its design function. Redundant detectors and controls are provided for control room temperature control. The CRACWS is designed in accordance with Seismic Category I requirements. The CRACWS is capable of removing sensible and latent heat loads from the control room, which include consideration of equipment heat loads and personnel occupancy requirements, to ensure equipment OPERABILITY.

The CRACWS satisfies Criterion 3 of 10 CFR 50.36 (Ref. 2).

BASES

LCO

Two independent and redundant trains of the CRACWS are required to be OPERABLE to ensure that at least one is available, assuming a single failure disabling the other train. Total system failure could result in the equipment operating temperature exceeding limits in the event of an accident.

The CRACWS is considered to be OPERABLE when the individual components necessary to maintain the control room temperature are OPERABLE in both trains. These components include a chiller package, chilled water pump, and air handling unit. In addition, the CRACWS must be OPERABLE to the extent that air circulation can be maintained.

The CRACWS is shared between the two units. The system must be OPERABLE for each unit when that unit is in the MODE of Applicability. A shutdown unit supplying its associated emergency power source (1EMXG/2EMXH) cannot be credited for OPERABILITY of components supporting the operating unit. If a CRACWS component becomes inoperable, then the Required Actions of this LCO must be entered independently for each unit that is in the MODE of applicability of the LCO.

APPLICABILITY

In MODES 1, 2, 3, 4, 5, and 6, and during movement of recently irradiated fuel assemblies, the CRACWS must be OPERABLE to ensure that the control room temperature will not exceed equipment operational requirements following a design basis accident. The CRACWS is only required to be OPERABLE during fuel handling involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 72 hours) due to radioactive decay.

ACTIONS

A.1

With one CRACWS train inoperable, action must be taken to restore OPERABLE status within 30 days. In this Condition, the remaining OPERABLE CRACWS train is adequate to maintain the control room temperature within limits. However, the overall reliability is reduced because a single failure in the OPERABLE CRACWS train could result in loss of CRACWS function. The 30 day Completion Time is based on the low probability of an event, the consideration that the remaining train can provide the required protection, and that alternate safety or nonsafety related cooling means are available.

ACTIONS (continued)

B.1 and B.2

In MODE 1, 2, 3, or 4, if the inoperable CRACWS train cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes the risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

C.1 and C.2

In MODE 5 or 6, or during movement of recently irradiated fuel, if the inoperable CRACWS train cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE CRACWS train must be placed in operation immediately. This action ensures that the remaining train is OPERABLE, and that active failures will be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that present a potential for releasing radioactivity. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

D.1

In MODE 5 or 6, or during movement of recently irradiated fuel assemblies, with two CRACWS trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

E.1

If both CRACWS trains are inoperable in MODE 1, 2, 3, or 4, the control room CRACWS may not be capable of performing its intended function. Therefore, LCO 3.0.3 must be entered immediately.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR verifies that the heat removal capability of the system is sufficient to maintain the temperature in the control room at or below 90°F. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 9.4.
2. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
3. 10 CFR 50.67, Accident source term.
4. Regulatory Guide 1.183, Revision 0.

B 3.7 PLANT SYSTEMS

B 3.7.12 Auxiliary Building Filtered Ventilation Exhaust System (ABFVES)

BASES

BACKGROUND

The ABFVES consists of two independent and redundant trains. Each train consists of a heater demister section and a filter unit section. The heater demister section consists of a prefilter/moisture separator (to remove entrained water droplets) and an electric heater (to reduce the relative humidity of air entering the filter unit). The filter unit section consists of a prefilter, an upstream HEPA filter, an activated carbon adsorber (for the removal of gaseous activity, principally iodines), a downstream HEPA, and a fan. The downstream HEPA filter is not credited in the accident analysis, but serves to collect carbon fines. Ductwork, valves or dampers, and instrumentation also form part of the system. Following receipt of a safety injection (SI) signal, the system isolates non safety portions of the ABFVES and exhausts air only from the Emergency Core Cooling System (ECCS) pump rooms.

The ABFVES is normally aligned to bypass the system HEPA filters and carbon adsorbers. During emergency operations, the ABFVES dampers are realigned to the filtered position, and fans are started to begin filtration. During emergency operations, the ABFVES dampers are realigned to isolate the non-safety portions of the system and only draw air from the ECCS pump rooms, as well as the Elevation 522 pipe chase, and Elevation 543 and 560 mechanical penetration rooms.

The ABFVES is discussed in the UFSAR, Sections 6.5, 9.4, 14.4, and 15.6 (Refs. 1, 2, 3, and 4, respectively) since it may be used for normal, as well as post accident, atmospheric cleanup functions. The heaters are not required for OPERABILITY, since the laboratory test of the carbon is performed at 95% relative humidity, but have been maintained in the system to provide additional margin (Ref. 9). Testing per ASTM D3803-1989 at 30°C and 95% relative humidity ensures that the filter efficiency is unaffected by moisture.

BASES

APPLICABLE SAFETY ANALYSES

The design basis of the ABFVES is established by the large break LOCA. The system evaluation assumes filtered and unfiltered leak rates in the Auxiliary Building throughout the accident. In such a case, the system limits radioactive release to within the 10 CFR 50.67 (Ref. 6) limits. The analysis of the effects and consequences of a large break LOCA is presented in Reference 4.

The ABFVES satisfies Criterion 3 of 10 CFR 50.36 (Ref. 7).

LCO

Two independent and redundant trains of the ABFVES are required to be OPERABLE to ensure that at least one is available, assuming that a single failure disables the other train coincident with a loss of offsite power. Total system failure could result in the atmospheric release from the ECCS pump rooms exceeding 10 CFR 50.67 limits in the event of a Design Basis Accident (DBA).

ABFVES is considered OPERABLE when the individual components necessary to maintain the ECCS pump rooms filtration are OPERABLE in both trains.

An ABFVES train is considered OPERABLE when its associated:

a. Fan is OPERABLE;

b. HEPA filters and carbon adsorbers are capable of performing their filtration functions; and

c. Ductwork, valves, and dampers are OPERABLE and air circulation can be maintained.

The ABFVES fans power supply is provided by buses which are shared between the two units. A shutdown unit supplying its associated emergency power source (1EMXG/2EMXH) cannot be credited for OPERABILITY of components supporting the operating unit.

BASES

LCO (continued)

The LCO is modified by a Note allowing the ECCS pump rooms pressure boundary to be opened intermittently under administrative controls. For entry and exit through doors, the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls consist of stationing a dedicated individual at the opening who is in continuous communication with the control room. This individual will have a method to rapidly close the opening when a need for ECCS pump rooms pressure boundary isolation is indicated.

APPLICABILITY

In MODES 1, 2, 3, and 4, the ABFVES is required to be OPERABLE consistent with the OPERABILITY requirements of the ECCS.

In MODE 5 or 6, the ABFVES is not required to be OPERABLE since the ECCS is not required to be OPERABLE.

ACTIONS

A.1

With one ABFVES train inoperable, action must be taken to restore OPERABLE status within 7 days. During this time, the remaining OPERABLE train is adequate to perform the ABFVES function.

The 7 day Completion Time is appropriate because the risk contribution is less than that for the ECCS (72 hour Completion Time), and this system is not a direct support system for the ECCS. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability.

Concurrent failure of two ABFVES trains would result in the loss of functional capability; therefore, LCO 3.0.3 must be entered immediately.

B.1

If the ECCS pump rooms pressure boundary is inoperable such that the ABFVES trains cannot establish or maintain the required pressure, action must be taken to restore an OPERABLE ECCS pump rooms pressure boundary within 24 hours. During the period that the ECCS pump rooms pressure boundary is inoperable, appropriate compensatory measures (consistent with the intent, as applicable, of GDC 19, 60, 64, and 10 CFR 50.67) should be utilized to protect plant personnel from potential

BASES

ACTIONS (continued)

hazards such as radioactive contamination, toxic chemicals, smoke, temperature and relative humidity, and physical security. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period and the use of compensatory measures. The 24 hour Completion Time is a typically reasonable time to diagnose, plan and possibly repair, and test most problems with the ECCS pump rooms pressure boundary.

C.1 and C.2

If the ABFVES train or ECCS pump rooms pressure boundary cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1

Systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train once a month provides an adequate check on this system. Operation for ≥ 15 continuous minutes demonstrates OPERABILITY of the system. Periodic operation ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.2

This SR verifies that the required ABFVES testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The ABFVES filter tests are in accordance with Reference 5. The VFTP includes testing HEPA filter performance, carbon adsorbers efficiency, system flow rate, and the physical properties of the activated carbon (general use and following specific operations). The system flow rate determination and in-place testing of the filter unit components is performed in the normal operating alignment with both trains in operation. Flow through each filter unit in this alignment is approximately 30,000 cfm. The normal operating alignment has been chosen to minimize normal radiological protection concerns that occur when the system is operated in an abnormal alignment for an extended period of time. Operation of the system in other alignments may alter flow rates to the extent that the 30,000 cfm ±10% specified in Technical Specification 5.5.11 will not be met. Flow rates outside the specified band under these operating alignments will not require the system to be considered inoperable.

Certain postulated failures and post accident recovery operational alignments may result in post accident system operation with only one train of ABFVES in a "normal" alignment. Under these conditions system flow rate is expected to increase above the normal flow band specified in Technical Specification 5.5.11. An analysis has been performed which conservatively predicts the maximum flow rate under these conditions is approximately 37,000 cfm. 37,000 cfm corresponds to a face velocity of approximately 48 ft/min that is significantly more than the normal 40 ft/min velocity specified in ASTM D3803-1989 (Ref. 10). Therefore, the laboratory test of the carbon penetration is performed in accordance with ASTM D3803-1989 and Generic Letter 99-02 at a face velocity of 48 ft/min. These test results are to be adjusted for a 2.27 inch bed using the methodology presented in ASTM D3803-1989 prior to comparing them to the Technical Specification 5.5.11 limit. Specific test Frequencies and additional information are discussed in detail in the VFTP.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.3

This SR verifies that each ABFVES train starts and operates with flow through the HEPA filters and carbon adsorbers on an actual or simulated actuation signal. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.12.4

This SR verifies the pressure boundary integrity of the ECCS pump rooms. The following rooms are considered to be ECCS pump rooms (with respect to the ABFVES): centrifugal charging pump rooms, safety injection pump rooms, residual heat removal pump rooms, and the containment spray pump rooms. Although the containment spray system is not normally considered an ECCS system, it is included in this ventilation boundary because of its accident mitigation function which requires the pumping of post accident containment sump fluid. The Elevation 522 pipe chase area is also maintained at a negative pressure by the ABFVES. Since the Elevation 543 and 560 mechanical penetration rooms communicate directly with the Elevation 522 pipe chase area, these penetration rooms are also maintained at a negative pressure by the ABFVES. The ability of the system to maintain the ECCS pump rooms at a negative pressure, with respect to potentially unfiltered adjacent areas, is periodically tested to verify proper functioning of the ABFVES. Upon receipt of a safety injection signal to initiate LOCA operation, the ABFVES is designed to maintain a slight negative pressure in the ECCS pump rooms, with respect to adjacent areas, to prevent unfiltered LEAKAGE. The ABFVES will continue to operate in this mode until the safety injection signal is reset. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

REFERENCES

1. UFSAR, Section 6.5.
2. UFSAR, Section 9.4.
3. UFSAR, Section 14.4.
4. UFSAR, Section 15.6.
5. Regulatory Guide 1.52 (Rev. 2).
6. 10 CFR 50.67.
7. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
8. Not used.
9. Catawba Nuclear Station License Amendments 90/84 for Units 1/2, August 23, 1991.
10. ASTM D3803-1989.

B 3.7 PLANT SYSTEMS

B 3.7.13 Fuel Handling Ventilation Exhaust System (FHVES)

BASES

BACKGROUND

The FHVES filters airborne radioactive particulates from the area of the fuel pool following a fuel handling accident. The FHVES, in conjunction with other normally operating systems, also provides environmental control of temperature and humidity in the fuel pool area.

The FHVES consists of two independent and redundant trains with two filter units per train. Each filter unit consists of a heater, prefilters/moisture separators, high efficiency particulate air (HEPA) filters, an activated carbon adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, valves or dampers, and instrumentation also form part of the system. The upstream HEPA filter bank functions to remove particulates and is credited in the safety analysis. A second bank of HEPA filters follows the adsorber section to collect carbon fines. The downstream HEPA filters are not credited in the analysis. A heater is included within each filter unit to reduce the relative humidity of the airstream. The heaters are not required for OPERABILITY, since the carbon laboratory tests are performed at 95% relative humidity, but have been maintained in the system to provide additional margin (Ref. 11). Testing per ASTM D3803-1989 at 30°C and 95% relative humidity ensures that the filter efficiency is unaffected by moisture. The system initiates filtered ventilation of the fuel handling building following receipt of a high radiation signal.

The FHVES train does not actuate on any Engineered Safety Feature Actuation System signal. One train is required to be in operation whenever recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 72 hours) is being moved in the fuel handling building. The operation of one train of FHVES ensures, if a fuel handling accident occurs, ventilation exhaust will be filtered before being released to the environment. The prefilters/moisture separators remove any large particles in the air, and any entrained water droplets present.

The FHVES is discussed in the UFSAR, Sections 6.5, 9.4, and 15.7 (Refs. 1, 2, and 3, respectively) because it may be used for normal, as well as atmospheric cleanup functions after a fuel handling accident in the spent fuel pool area.

BASES

APPLICABLE SAFETY ANALYSES

The FHVES design basis is established by the consequences of the applicable Design Basis Accidents (DBA), which are the fuel handling accident involving handling recently irradiated fuel and the weir gate drop accident. The analysis of the fuel handling accident assumes that all fuel rods in an assembly are damaged. The DBA analysis of the fuel handling accident assumes that only one train of the FHVES is in operation. The amount of fission products available for release from the fuel handling building is determined for a fuel handling accident. These assumptions and the analysis follow the guidance provided in Regulatory Guide 1.25 (Ref. 4) and 1.183 (Ref. 10).

The FHVES satisfies Criterion 3 of 10 CFR 50.36 (Ref. 5).

LCO

Two trains of the FHVES are required to be OPERABLE and one train in operation whenever recently irradiated fuel is being moved in the fuel handling building. Total system failure could result in the atmospheric release from the fuel handling building exceeding the 10 CFR 50.67 (Ref. 9) limits in the event of a fuel handling accident involving handling recently irradiated fuel.

The FHVES is considered OPERABLE when the individual components necessary to control exposure in the fuel handling building are OPERABLE. An FHVES train is considered OPERABLE when its associated:

a. Fans are OPERABLE;

b. HEPA filters and carbon adsorbers are capable of performing their filtration functions; and

c. Ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.

APPLICABILITY

During movement of recently irradiated fuel in the fuel handling area, the FHVES is required to be OPERABLE and in operation to alleviate the consequences of a fuel handling accident.

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply.

ACTIONS (continued)

With the movement of recently irradiated fuel in the fuel handling building, two trains of FHVES are required to be OPERABLE and one in operation. The movement of recently irradiated fuel must be immediately suspended, if one or more trains of FHVES are inoperable or one is not in operation. This does not preclude the movement of an irradiated fuel assembly to a safe position. This action ensures that a fuel handling accident with unacceptable consequences could not occur.

SURVEILLANCE REQUIREMENTS

SR 3.7.13.1

With the FHVES train in service, a periodic monitoring of the system for proper operation should be checked on a routine basis to ensure that the system is functioning properly. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.13.2

Systems should be checked periodically to ensure that they function properly. Operation for $\geq$ 15 continuous minutes demonstrates OPERABILITY of the system. Periodic operation ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.13.3

This SR verifies that the required FHVES testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The FHVES filter tests are in accordance with Regulatory Guide 1.52 (Ref. 7). The VFTP includes testing HEPA filter performance, carbon adsorber efficiency, system flow rate, and the physical properties of the activated carbon (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.13.4

This SR verifies the integrity of the fuel building enclosure. The ability of the system to maintain the fuel building at a negative pressure with respect to atmospheric pressure is periodically tested to verify proper function of the FHVES. During operation, the FHVES is designed to maintain a slight negative pressure in the fuel building, to prevent unfiltered LEAKAGE. The FHVES is designed to maintain ≤ -0.25 inches water gauge with respect to atmospheric pressure at a flow rate of ≤ 36,443 cfm. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.13.5

Operating the FHVES filter bypass damper is necessary to ensure that the system functions properly. The OPERABILITY of the FHVES filter bypass damper is verified if it can be manually closed. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

REFERENCES

1. UFSAR, Section 6.5.
2. UFSAR, Section 9.4.
3. UFSAR, Section 15.7.
4. Regulatory Guide 1.25.
5. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
6. Not used.
7. Regulatory Guide 1.52 (Rev. 2).
8. Not used.
9. 10 CFR 50.67, Accident source term.
10. Regulatory Guide 1.183 (Rev. 0).
11. Catawba Nuclear Station License Amendments 90/84 for Units 1/2, August 23, 1991.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 AC Sources—Operating

BASES

BACKGROUND

The unit Essential Auxiliary Power Distribution System AC sources consist of the offsite power sources (preferred power sources, normal and alternate(s)), and the onsite standby power sources (Train A and Train B diesel generators (DGs)). As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

The onsite Class 1E AC Distribution System is divided into redundant load groups (trains) so that the loss of any one group does not prevent the minimum safety functions from being performed. Each train has connections to two preferred offsite power sources and a single DG.

At the 600V level of the onsite Class 1E AC Distribution System, each unit has one motor control center (MCC), 1EMXG and 2EMXH, that each supply power to a train of shared systems. The term shared systems is defined as the shared components of Train A or Train B of Nuclear Service Water System (NSWS), Control Room Area Ventilation System (CRAVS), Control Room Area Chilled Water System (CRACWS) and Auxiliary Building Filtered Ventilation Exhaust System (ABFVES) whose power supply can be swapped between the Units. The MCC 1EMXG is normally aligned to receive power from load center 1ELXA but if desired or required to maintain operability of the Train A shared systems, can be swapped to receive power from load center 2ELXA. The MCC 2EMXH is normally aligned to receive power from load center 2ELXB but if desired or required to maintain operability of the Train B shared systems, can be swapped to receive power from load center 1ELXB. The four NSWS pumps (1A, 2A, 1B and 2B) are shared components that receive power at the Unit and Train specific 4160V level of the onsite Class 1E AC Distribution System and whose power supply cannot be swapped between the Units. Therefore, the four NSWS pumps are not part of the "shared systems," as defined above, because the power supply for a particular NSWS pump cannot come from the opposite unit.

There are also provisions to accommodate the connecting of the Emergency Supplemental Power Source (ESPS) to one train of either unit's Class 1E AC Distribution System. The ESPS consists of two 50% capacity non-safety related commercial grade DGs. Manual actions are

BACKGROUND (continued)

required to align the ESPS to the station and only one of the station's four onsite Class 1E Distribution System trains can be supplied by the ESPS at any given time. The ESPS is made available to support extended Completion Times in the event of an inoperable DG as well as a defense-in-depth source of AC power to mitigate a station blackout event. The ESPS would remain disconnected from the Class 1E AC Distribution System unless required for supplemental power to one of the four 4.16 kV ESF buses.

From the transmission network, two electrically and physically separated circuits provide AC power, through step down station auxiliary transformers, to the 4.16 kV ESF buses. A detailed description of the offsite power network and the circuits to the Class 1E ESF buses is found in the UFSAR, Chapter 8 (Ref. 2).

A qualified offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network to the onsite Class 1E ESF bus(es).

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the transformer supplying offsite power to the onsite Class 1E Distribution System. Within 1 minute after the initiating signal is received, all automatic and permanently connected loads needed to recover the unit or maintain it in a safe condition are returned to service via the load sequencer.

The onsite standby power source for each 4.16 kV ESF bus is a dedicated DG. DGs A and B are dedicated to ESF buses ETA and ETB, respectively. A DG starts automatically on a safety injection (SI) signal (i.e., low pressurizer pressure or high containment pressure signals) or on an ESF bus degraded voltage or undervoltage signal (refer to LCO 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation"). After the DG has started, it will automatically tie to its respective bus after offsite power is tripped as a consequence of ESF bus undervoltage or degraded voltage, independent of or coincident with an SI signal. With no SI signal, there is a 10 minute delay between degraded voltage signal and the DG start signal. The DGs will also start and operate in the standby mode without tying to the ESF bus on an SI signal alone. Following the trip of offsite power, a sequencer strips loads from the ESF bus. When the DG is tied to the ESF bus, loads are then sequentially connected to its respective ESF bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading the DG by automatic load application.

BACKGROUND (continued)

In the event of a loss of preferred power, the ESF electrical loads are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a Design Basis Accident (DBA) such as a loss of coolant accident (LOCA).

Certain required unit loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Approximately 1 minute after the initiating signal is received, all loads needed to recover the unit or maintain it in a safe condition are returned to service.

Ratings for Train A and Train B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3). The continuous service rating of each DG is 7000 kW with 10% overload permissible for up to 2 hours in any 24 hour period. The ESF loads that are powered from the 4.16 kV ESF buses are listed in Reference 2.

APPLICABLE SAFETY ANALYSES

The initial conditions of DBA and transient analyses in the UFSAR, Chapter 6 (Ref. 4) and Chapter 15 (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

The OPERABILITY of the AC electrical power sources is consistent with the initial assumptions of the Accident analyses and is based upon meeting the design basis of the unit. This results in maintaining at least one train of the onsite or offsite AC sources OPERABLE during Accident conditions in the event of:

a. An assumed loss of all offsite power or all onsite AC power; and

b. A worst case single failure.

The AC sources satisfy Criterion 3 of 10 CFR 50.36 (Ref. 6).

LCO

Two qualified circuits between the offsite transmission network and the onsite Essential Auxiliary Power System and separate and independent DGs for each train ensure availability of the required power to shut down

LCO (continued)

the reactor and maintain it in a safe shutdown condition after an anticipated operational occurrence (AOO) or a postulated DBA.

Additionally, the qualified circuit(s) between the offsite transmission network and the opposite unit onsite Essential Auxiliary Power System when necessary to power shared systems and the NSWS pump(s) and the opposite unit DG(s) when necessary to power shared systems and the NSWS pump(s) ensure availability of the required power to shut down the reactor and maintain it in a safe shutdown condition after an AOO or a postulated DBA.

Qualified offsite circuits are those that are described in the UFSAR and are part of the licensing basis for the unit.

In addition, one required automatic load sequencer per train must be OPERABLE.

Each offsite circuit must be capable of maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the ESF buses.

The 4.16 kV essential system is divided into two completely redundant and independent trains designated A and B, each consisting of one 4.16 kV switchgear assembly, three 4.16 kV/600 V transformers, two 600 V load centers, and associated loads.

Normally, each Class 1E 4.16 kV switchgear is powered from its associated non-Class 1E train of the 6.9 kV Normal Auxiliary Power System as discussed in "6.9 kV Normal Auxiliary Power System" in Chapter 8 of the UFSAR (Ref. 2). Additionally, a standby source of power to each 4.16 kV essential switchgear, not required by General Design Criterion 17, is provided from the 6.9 kV system via two separate and independent 6.9/4.16 kV transformers. These transformers are shared between units and provide the capability to supply a standby source of preferred power to each unit's 4.16 kV essential switchgear from either unit's 6.9 kV system. A key interlock scheme is provided to preclude the possibility of connecting the two units together at either the 6.9 or 4.16 kV level.

Each train of the 4.16 kV Essential Auxiliary Power System is also provided with a separate and independent emergency diesel generator to supply the Class 1E loads required to safely shut down the unit following a design basis accident. Additionally, each diesel generator is capable of supplying its associated 4.16 kV blackout switchgear through a connection with the 4.16 kV essential switchgear.

LCO (continued)

Each DG must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus undervoltage. This will be accomplished within 11 seconds. Each DG must also be capable of accepting required loads within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby with the engine at ambient conditions. Additional DG capabilities must be demonstrated to meet required Surveillance, e.g., capability of the DG to revert to standby status on an ECCS signal while operating in parallel test mode.

Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY.

The AC sources in one train must be separate and independent (to the extent possible) of the AC sources in the other train. For the DGs, separation and independence are complete.

For the offsite AC sources, separation and independence are provided to the extent practical.

LCO 3.8.1.c and LCO 3.8.1.d both use the word "necessary" to clarify that the qualified offsite circuit(s) in LCO 3.8.1.c and the DG(s) from the opposite unit in LCO 3.8.1.d are required to shut down the reactor and maintain it in a safe shutdown condition after an AOO or a postulated DBA.

LCO 3.8.1.c specifies that the qualified circuit(s) between the offsite transmission network and the opposite unit's Onsite Essential Auxiliary Power System be OPERABLE when necessary to supply power to the shared systems and NSWS pump(s). LCO 3.8.1.d specifies that the DG(s) from the opposite unit be OPERABLE when necessary to supply power to the shared systems and NSWS pump(s). The LCO 3.8.1.c AC sources in one train must be separate and independent (to the extent possible) of the LCO 3.8.1.c AC sources in the other train. These requirements, in conjunction with the requirements for the applicable unit AC electrical power sources in LCO 3.8.1.a and LCO 3.8.1.b, ensure that power is available to two trains of the shared NSWS, CRAVS, CRACWS and ABFVES, as well as to the NSWS pump(s).

With no equipment inoperable, two LCO 3.8.1.c AC sources are required to be OPERABLE and two LCO 3.8.1.d AC sources are required to be OPERABLE for each unit. For example, with both units in MODE 1, Unit 1 LCO 3.8.1.c is met by an OPERABLE 2A offsite circuit and an

LCO (continued)

OPERABLE 2B offsite circuit. LCO 3.8.1.d is met by an OPERABLE 2A DG and an OPERABLE 2B DG. In a normal plant alignment, the 2A offsite circuit and the 2A DG are relied upon as the normal and emergency power supplies for the 2A NSWS Pump, a shared component. The 2B offsite circuit and the 2B DG are relied upon as the normal and emergency power supplies for the 2B NSWS Pump, a shared component, as well as the Train B shared systems that are powered at the 600V level of the onsite Class 1E AC Distribution System. For Unit 2, LCO 3.8.1.c is met by an OPERABLE 1A offsite circuit and an OPERABLE 1B offsite circuit. LCO 3.8.1.d is met by an OPERABLE 1A DG and an OPERABLE 1B DG. In a normal plant alignment, the 1A offsite circuit and the 1A DG are relied upon as the normal and emergency power supplies for the 1A NSWS Pump, a shared component, as well as the Train A shared systems that are powered at the 600V level of the onsite Class 1E AC Distribution System. The 1B offsite circuit and the 1B DG are relied upon as the normal and emergency power supplies for the 1B NSWS Pump, shared component.

APPLICABILITY

The AC sources and sequencers are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

A Note has been added taking exception to the Applicability requirements for the required AC sources in LCO 3.8.1.c and LCO 3.8.1.d provided the associated shared systems and NSWS pump(s) are inoperable. This exception is intended to allow declaring the shared systems and NSWS pump(s) supported by the opposite unit inoperable either in lieu of declaring the opposite unit AC sources inoperable, or at any time subsequent to entering ACTIONS for an inoperable opposite unit AC source.

This exception is acceptable since, with the shared systems and NSWS pump(s) supported by the opposite unit inoperable and the associated ACTIONS entered, the opposite unit AC sources provide no additional assurance of meeting the above criteria.

The AC power requirements for MODES 5 and 6 are covered in LCO 3.8.2, "AC Sources—Shutdown."

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable DG. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable DG and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

To ensure a highly reliable power source remains with one LCO 3.8.1.a offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable, and Condition E, for two offsite circuits inoperable, is entered.

A.2

Required Action A.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required features.

These features are powered from the redundant AC electrical power train. This includes motor driven auxiliary feedwater pumps. The turbine driven auxiliary feedwater pump is required to be considered a redundant required feature, and, therefore, required to be determined OPERABLE by this Required Action. Three independent AFW pumps are required to ensure the availability of decay heat removal capability for all events accompanied by a loss of offsite power and a single failure. System design is such that the remaining OPERABLE motor driven auxiliary feedwater pump is not by itself capable of providing 100% of the auxiliary feedwater flow assumed in the safety analysis.

The Completion Time for Required Action A.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. The train has no offsite power supplying it loads; and

b. A required feature on the other train is inoperable.

ACTIONS (continued)

If at any time during the existence of Condition A (one LCO 3.8.1.a offsite circuit inoperable) a redundant required feature subsequently becomes inoperable, this Completion Time begins to be tracked.

Discovering no offsite power to one train of the onsite Class 1E Electrical Power Distribution System coincident with one or more inoperable required support or supported features, or both, that are associated with the other train that has offsite power, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining OPERABLE offsite circuits and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System. The 24 hour Completion Time takes into account the component OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 24 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 DBA occurring during this period.

A.3

According to Regulatory Guide 1.93 (Ref. 7), operation may continue in Condition A for a period that should not exceed 72 hours. With one offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this Condition, however, the remaining OPERABLE offsite circuit and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System.

The 72 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 DBA occurring during this period.

The second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet LCO 3.8.1.a or LCO 3.8.1.b. If Condition A is entered while, for instance, a LCO 3.8.1.b DG is inoperable and that DG is subsequently returned OPERABLE, the LCO may already have been not met for up to 14 days. This could lead to a total of 17 days, since initial failure to meet LCO 3.8.1.a or LCO 3.8.1.b, to restore the offsite circuit. At this time, a DG could again become inoperable, the circuit restored OPERABLE, and an additional 14 days (for a total of 31 days) allowed

ACTIONS (continued)

prior to complete restoration of LCOs 3.8.1.a and 3.8.1.b. The 17 day Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet LCO 3.8.1.a or LCO 3.8.1.b. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 72 hour and 17 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action A.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time that LCO 3.8.1.a or LCO 3.8.1.b was initially not met, instead of at the time Condition A was entered.

B.1

It is required to administratively verify the LCO 3.8.1.d DG(s) OPERABLE within 1 hour and to continue this action once per 12 hours thereafter until restoration of the required LCO 3.8.1.b DG is accomplished. This verification provides assurance that the LCO 3.8.1.d DG is capable of supplying the onsite Class 1E AC Electrical Power Distribution System.

If one LCO 3.8.1.d DG is discovered to be inoperable when performing the administrative verification of operability, then Condition D is entered for that DG. If two LCO 3.8.1.d DGs are discovered to be inoperable when performing the administrative verification of operability, then Condition G is entered.

B.2

To ensure a highly reliable power source remains with an inoperable LCO 3.8.1.b DG, it is necessary to verify the availability of the required offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered.

B.3

Required Action B.3 is intended to provide assurance that a loss of offsite power, during the period that a LCO 3.8.1.b DG is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. This includes

ACTIONS (continued)

motor driven auxiliary feedwater pumps. The turbine driven auxiliary feedwater pump is required to be considered a redundant required feature, and, therefore, required to be determined OPERABLE by this Required Action. Three independent AFW pumps are required to ensure the availability of decay heat removal capability for all events accompanied by a loss of offsite power and a single failure. System design is such that the remaining OPERABLE motor driven auxiliary feedwater pump is not by itself capable of providing 100% of the auxiliary feedwater flow assumed in the safety analysis. Redundant required feature failures consist of inoperable features associated with a train, redundant to the train that has an inoperable LCO 3.8.1.b DG.

The Completion Time for Required Action B.3 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. An inoperable LCO 3.8.1.b DG exists; and

b. A required feature on the other train (Train A or Train B) is inoperable.

If at any time during the existence of this Condition (one LCO 3.8.1.b DG inoperable) a required feature subsequently becomes inoperable, this Completion Time would begin to be tracked.

Discovering one required LCO 3.8.1.b DG inoperable coincident with one or more inoperable required support or supported features, or both, that are associated with the OPERABLE DG, results in starting the Completion Time for the Required Action. Four hours from the discovery of these events existing concurrently is Acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

In this Condition, the remaining OPERABLE DGs and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The 4 hour Completion Time takes into account the OPERABILITY of the redundant counterpart to the inoperable required 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 DBA occurring during this period.

ACTIONS (continued)

B.4.1 and B.4.2

Required Action B.4.1 provides an allowance to avoid unnecessary testing of OPERABLE DG(s). If it can be determined that the cause of the inoperable DG does not exist on the OPERABLE DG, SR 3.8.1.2 does not have to be performed. If the cause of inoperability exists on other DG(s), the other DG(s) would be declared inoperable upon discovery and Condition D and/or G of LCO 3.8.1, as applicable, would be entered. Once the failure is repaired, the common cause failure no longer exists, and Required Action B.4.1 is satisfied. If the cause of the initial inoperable DG cannot be confirmed not to exist on the remaining DG(s), performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of that DG.

In the event the inoperable DG is restored to OPERABLE status prior to completing either B.4.1 or B.4.2, the problem investigation process 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.

These Conditions are not required to be entered if the inoperability of the DG is due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, these Required Actions are to be completed regardless of when the inoperable DG is restored to OPERABLE status.

According to Generic Letter 84-15 (Ref. 8), 24 hours is reasonable to confirm that the OPERABLE DG(s) is not affected by the same problem as the inoperable DG.

B.5

In order to extend the Completion Time for an inoperable DG from 72 hours to 14 days, it is necessary to ensure the availability of the ESPS within 1 hour of entry into TS 3.8.1 LCO and every 12 hours thereafter.

Since Required Action B.5 only specifies "evaluate," discovering the ESPS unavailable does not result in the Required Action being not met (i.e. the evaluation is performed). However, on discovery of an unavailable ESPS, the Completion Time for Required Action B.6 starts the 72 hour and/or 24 hour clock.

ESPS availability requires that:

1) The load test has been performed within 30 days of entry into the extended Completion Time. The Required Action evaluation is met with

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an administrative verification of this prior to testing; and

2) ESPS fuel tank level is verified locally to be ≥ 24 hour supply; and

3) ESPS supporting system parameters for starting and operating are verified to be within required limits for functional availability (e.g., battery state of charge).

The ESPS is not used to extend the Completion Time for more than one inoperable DG at any one time.

B.6

In accordance with Branch Technical Position 8-8 (Ref. 14), operation may continue in Condition B for a period that should not exceed 14 days, provided a supplemental AC power source is available.

In Condition B, the remaining OPERABLE DGs, available ESPS and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. The 14 day 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 DBA occurring during this period.

If the ESPS is or becomes unavailable with an inoperable LCO 3.8.1.b DG, then action is required to restore the ESPS to available status or to restore the DG to OPERABLE status within 72 hours from discovery of unavailable ESPS. However, if the ESPS unavailability occurs at or sometime after 48 hours of continuous LCO 3.8.1.b DG inoperability, then the remaining time to restore the ESPS to available status or to restore the DG to OPERABLE status is limited to 24 hours.

The 72 hour and 24 hour Completion Times allow for an exception to the normal "time zero" for beginning the allowed outage time "clock." The 72 hour Completion Time only begins on discovery that both:

a. An inoperable DG exists; and
b. ESPS is unavailable.

The 24 hour Completion Time only begins on discovery that:

a. An inoperable DG exists for ≥ 48 hours; and
b. ESPS is unavailable.

Therefore, when one LCO 3.8.1.b DG is inoperable due to either

ACTIONS (continued)

preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the Completion Time can be extended from 72 hours to 14 days if ESPS is verified available for backup operation.

The fourth Completion Time for Required Action B.6 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet LCO 3.8.1.a or LCO 3.8.1.b. If Condition B is entered while, for instance, a LCO 3.8.1.a offsite circuit is inoperable and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 72 hours. This could lead to a total of 17 days, since initial failure to meet LCO 3.8.1.a or LCO 3.8.1.b, to restore the DG. At this time, a LCO 3.8.1.a offsite circuit could again become inoperable, the DG restored OPERABLE, and an additional 72 hours (for a total of 20 days) allowed prior to complete restoration of LCO 3.8.1.a and LCO 3.8.1.b. The 17 day Completion Time provides a limit on time allowed in a specified condition after discovery of failure to meet LCO 3.8.1.a or LCO 3.8.1.b. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 14 day and 17 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action B.3, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time that LCO 3.8.1.a or LCO 3.8.1.b was initially not met, instead of at the time Condition B was entered.

C.1

Condition C addresses the inoperability of the LCO 3.8.1.c qualified offsite circuit(s) between the offsite transmission network and the opposite unit's Onsite Essential Auxiliary Power System when the LCO 3.8.1.c qualified offsite circuit(s) is necessary to supply power to the shared systems and NSWS pump(s). If Condition C is entered concurrently with the inoperability of LCO 3.8.1.d DG(s) the NOTE requires the licensed operator to evaluate if the TS 3.8.9 "Distribution Systems – Operating" requirement that "OPERABLE AC electrical power distribution subsystems require the associated buses, load centers, motor control centers, and distribution panels to be energized to their proper voltages" continues to be met. In the case where the inoperable LCO 3.8.1.c qualified offsite circuit and inoperable LCO 3.8.1.d DG are associated with the same train there is no longer assurance that train of "Distribution Systems – Operating" can be energized to the proper

ACTIONS (continued)

voltage and therefore TS 3.8.9 Condition A must be entered.

To ensure a highly reliable power source remains with one required LCO 3.8.1.c offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable, and Condition A and E, as applicable, for the two offsite circuits inoperable, is entered.

C.2

Required Action C.2, which only applies if the train cannot be powered from an offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function for the NSWS (including the NSWS pump), CRAVS, CRACWS or the ABFVES. The Completion Time for Required Action C.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. The train has no offsite power supplying its loads: and

b. NSWS (including the NSWS pump), CRAVS, CRACWS or ABFVES on the other train that has offsite power is inoperable.

If at any time during the existence of Condition C (one required LCO 3.8.1.c offsite circuit inoperable) a train of NSWS (including the NSWS pump), CRAVS, CRACWS or ABFVES becomes inoperable, this Completion Time begins to be tracked.

Discovering no offsite power to one train of the onsite Class 1E Electrical Power Distribution System coincident with one train of NSWS (including the NSWS pump), CRAVS, CRACWS or ABFVES that is associated with the other train that has offsite power, results in starting the Completion Times for the Required Action. Twenty-four hours is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

The remaining OPERABLE offsite circuits and DGs are adequate to supply electrical power to Train A and Train B of the onsite Class 1E Distribution System. The 24 hour Completion Time takes into account

ACTIONS (continued)

the component OPERABILITY of the redundant counterpart to the inoperable NSWS (including the NSWS pump), CRAVS, CRACWS or ABFVES. Additionally, the 24 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 DBA occurring during this period.

C.3

Consistent with the time provided in ACTION A, operation may continue in Condition C for a period that should not exceed 72 hours. With one required LCO 3.8.1.c offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the unit safety systems. In this Condition, however, the remaining OPERABLE offsite circuits and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System.

If the LCO 3.8.1.c required offsite circuit cannot be restored to OPERABLE status within 72 hours, then Condition I must be entered immediately.

D.1

Condition D addresses the inoperability of the LCO 3.8.1.d DG(s) aligned to the opposite unit Onsite Essential Auxiliary Power System that is supplying power to a train of shared systems and to the respective NSWS pump(s). If Condition D is entered concurrently with the inoperability of LCO 3.8.1.c qualified offsite circuit, the NOTE requires the licensed operator to evaluate if the TS 3.8.9 "Distribution Systems – Operating" requirement that "OPERABLE AC electrical power distribution subsystems require the associated buses, load centers, motor control centers, and distribution panels to be energized to their proper voltages" continues to be met. In the case where the inoperable LCO 3.8.1.d DG and inoperable LCO 3.8.1.c qualified offsite circuit are associated with the same train there is no longer assurance that train of "Distribution Systems – Operating" can be energized to the proper voltage and therefore TS 3.8.9 Condition A must be entered.

It is required to administratively verify the LCO 3.8.1.b safety-related DGs OPERABLE and the opposite unit's DG OPERABLE within one hour and to continue this action once per 12 hours thereafter until restoration of the required LCO 3.8.1.d DG and the opposite unit's DG is accomplished. This verification provides assurance that the LCO 3.8.1.b safety-related DGs and the opposite unit's DG is capable of supplying the onsite Class

ACTIONS (continued)

1E AC Electrical Power Distribution System.

If one LCO 3.8.1.b DG is discovered to be inoperable when performing the administrative verification of operability, then Condition B is entered for that DG. If two LCO 3.8.1.b DGs are discovered to be inoperable, then Condition G is entered. If one LCO 3.8.1.b DG that provides power to shared systems is discovered inoperable and the LCO 3.8.1.d DG that was initially inoperable provides power to shared systems, then Condition G is also entered. If one LCO 3.8.1.b DG that provides power to shared systems is discovered inoperable and the LCO 3.8.1.d DG that was initially inoperable only provides power to its respective NSWS pump, then Condition B is entered for the LCO 3.8.1.b DG.

If the second LCO 3.8.1.d DG, which is the other opposite unit's DG, is found to be inoperable when performing the administrative verification of operability, then Condition G is entered.

D.2

To ensure a highly reliable power source remains with one required LCO 3.8.1.d DG inoperable, it is necessary to verify the OPERABILITY of the required offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered.

D.3

Required Action D.3 is intended to provide assurance that a loss of offsite power, during the period one required LCO 3.8.1.d DG is inoperable, does not result in a complete loss of safety function for the NSWS (including the NSWS pump), CRAVS, CRACWS or the ABFVES. The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. An inoperable LCO 3.8.1.d DG exists; and

b. NSWS (including the NSWS pump), CRAVS, CRACWS or ABFVES on the other train that has emergency power is inoperable.

ACTIONS (continued)

If at any time during the existence of this Condition (the LCO 3.8.1.d DG inoperable) a train of NSWS (including the NSWS pump), CRAVS, CRACWS or ABFVES becomes inoperable, this Completion Time begins to be tracked.

Discovering the LCO 3.8.1.d DG inoperable coincident with one train of NSWS (including the NSWS pump), CRAVS, CRACWS or ABFVES that is associated with the other train that has emergency power results in starting the Completion Time for the Required Action. Four hours from the discovery of these events existing concurrently is acceptable because it minimizes risk while allowing time for restoration before subjecting the unit to transients associated with shutdown.

In this Condition, the remaining OPERABLE DGs and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. Thus, on a component basis, single failure protection for the NSWS (including the NSWS pump), CRAVS, CRACWS or ABFVES may have been lost; however, function has not been lost. The four hour Completion Time also takes into account the capacity and capability of the remaining NSWS (including the NSWS pump), CRAVS, CRACWS and ABFVES train, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

D.4.1 and D.4.2

Required Action D.4.1 provides an allowance to avoid unnecessary testing of OPERABLE DGs. If it can be determined that the cause of the inoperable DG does not exist on the OPERABLE DG(s), SR 3.8.1.2 does not have to be performed. If the cause of inoperability exists on other DG(s), the other DG(s) would be declared inoperable upon discovery and Condition B and I of LCO 3.8.1, as applicable, would be entered. Once the failure is repaired, the common cause failure no longer exists and Required Action D.4.1 is satisfied. If the cause of the initial inoperable DG cannot be confirmed not to exist on the remaining DG(s), performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of the DG(s).

In the event the inoperable DG is restored to OPERABLE status prior to completing either D.4.1 or D.4.2, the problem investigation process will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition D.

According to Generic Letter 84-15 (Ref. 8), 24 hours is reasonable to confirm that the OPERABLE DG(s) is not affected by the same problem

ACTIONS (continued)

as the inoperable DG.

D.5

In order to extend the Completion Time for an inoperable DG from 72 hours to 14 days, it is necessary to ensure the availability of the ESPS within 1 hour of entry into TS 3.8.1 LCO and every 12 hours thereafter.

Since Required Action D.5 only specifies "evaluate," discovering the ESPS unavailable does not result in the Required Action being not met (i.e. the evaluation is performed). However, on discovery of an unavailable ESPS, the Completion Time for Required Action D.6 starts the 72 hour and/or 24 hour clock.

ESPS availability requires that:

1) The load test has been performed within 30 days of entry into the extended Completion Time. The Required Action evaluation is met with an administrative verification of this prior to testing; and

2) ESPS fuel tank level is verified locally to be ≥ 24 hour supply; and

3) ESPS supporting system parameters for starting and operating are verified to be within required limits for functional availability (e.g., battery state of charge).

The ESPS is not used to extend the Completion Time for more than one inoperable DG at any one time.

D.6

In accordance with Branch Technical Position 8-8 (Ref. 14), operation may continue in Condition D for a period that should not exceed 14 days, provided a supplemental AC power source is available.

In Condition D, the remaining OPERABLE DGs, unavailable ESPS, and offsite power circuits are adequate to supply electrical power to the Class 1E Distribution System. The 14 day 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 DBA occurring during this period.

If the ESPS is or becomes unavailable with an inoperable LCO 3.8.1.d DG, then action is required to restore the ESPS to available status or to restore the DG to OPERABLE status within 72 hours from discovery of

ACTIONS (continued)

unavailable ESPS. However, if the ESPS unavailability occurs at or sometime after 48 hours of continuous LCO 3.8.1.d DG inoperability, then the remaining time to restore the ESPS to available status or to restore the DG to OPERABLE status is limited to 24 hours.

The 72 hour and 24 hour Completion Times allow for an exception to the normal "time zero" for beginning the allowed outage time "clock." The 72 hour Completion Time only begins on discovery that both:

a. An inoperable DG exists; and
b. ESPS is unavailable.

The 24 hour Completion Time only begins on discovery that:

a. An inoperable DG exists for ≥ 48 hours; and
b. ESPS is unavailable.

Therefore, when one LCO 3.8.1.d DG is inoperable due to either preplanned maintenance (preventive or corrective) or unplanned corrective maintenance work, the Completion Time can be extended from 72 hours to 14 days if ESPS is verified available for backup operation.

The fourth Completion Time for Required Action D.6 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet LCO 3.8.1.c or LCO 3.8.1.d. If Condition D is entered while, for instance, a LCO 3.8.1.c offsite circuit is inoperable and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 72 hours. This could lead to a total of 17 days, since initial failure to meet LCO 3.8.1.c or LCO 3.8.1.d, to restore the DG. At this time, a LCO 3.8.1.c offsite circuit could again become inoperable, the DG restored OPERABLE, and an additional 72 hours (for a total of 20 days) allowed prior to complete restoration of LCO 3.8.1.c and LCO 3.8.1.d. The 17 day Completion Time provides a limit on time allowed in a specified condition after discovery of failure to meet LCO 3.8.1.c or LCO 3.8.1.d. This limit is considered reasonable for situations in which Conditions C and D are entered concurrently. The "AND" connector between the 14 day and 17 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

E.1 and E.2

Condition E is entered when both offsite circuits required by LCO 3.8.1.a are inoperable, or when the offsite circuit required by LCO 3.8.1.c and

ACTIONS (continued)

one offsite circuit required by LCO 3.8.1.a are concurrently inoperable. Condition E is also entered when two offsite circuits required by LCO 3.8.1.c are inoperable.

Required Action E.1, which applies when two offsite circuits are inoperable, is intended to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions. The Completion Time for this failure of redundant required features is reduced to 12 hours from that allowed for one train without offsite power (Required Action A.2). The rationale for the reduction to 12 hours is that Regulatory Guide 1.93 (Ref. 7) allows a Completion Time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete safety trains are OPERABLE. When a concurrent redundant required feature failure exists, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate. These features are powered from redundant AC safety trains. This includes motor driven auxiliary feedwater pumps.

Single train features, such as turbine driven auxiliary pumps, are not included in the list.

The Completion Time for Required Action E.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action the Completion Time only begins on discovery that both:

a. All required offsite circuits are inoperable; and

b. A required feature is inoperable.

If at any time during the existence of Condition E (two LCO 3.8.1.a offsite circuits inoperable or one LCO 3.8.1.a offsite circuit and one LCO 3.8.1.c offsite circuit inoperable or two LCO 3.8.1.c offsite circuits inoperable) a required feature becomes inoperable, this Completion Time begins to be tracked.

According to Regulatory Guide 1.93 (Ref. 7), operation may continue in Condition E for a period that should not exceed 24 hours. This level of degradation means that the offsite electrical power system does not have the capability to affect a safe shutdown and to mitigate the effects of an accident; however, the onsite AC sources have not been degraded. This level of degradation generally corresponds to a total loss of the immediately accessible offsite power sources.

ACTIONS (continued)

Because of the normally high availability of the offsite sources, this level of degradation may appear to be more severe than other combinations of two AC sources inoperable that involve one or more DGs inoperable. However, two factors tend to decrease the severity of this level of degradation:

a. The configuration of the redundant AC electrical power system that remains available is not susceptible to a single bus or switching failure; and

b. The time required to detect and restore an unavailable offsite power source is generally much less than that required to detect and restore an unavailable onsite AC source.

With both of the required offsite circuits inoperable, sufficient onsite AC sources are available to maintain the unit in a safe shutdown condition in the event of a DBA or transient. In fact, a simultaneous loss of offsite AC sources, a LOCA, and a worst case single failure were postulated as a part of the design basis in the safety analysis. Thus, the 24 hour Completion Time provides a period of time to effect restoration of one of the offsite circuits commensurate with the importance of maintaining an AC electrical power system capable of meeting its design criteria.

According to Reference 6, with the available offsite AC sources, two less than required by the LCO, operation may continue for 24 hours. If two offsite sources are restored within 24 hours, unrestricted operation may continue. If only one offsite source is restored within 24 hours, power operation continues in accordance with Condition A or C, as applicable.

<u>F.1 and F.2</u>

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it were inoperable, resulting in de-energization. Therefore, the Required Actions of Condition F are modified by a Note to indicate that when Condition F is entered with no AC source to any train, the Conditions and Required Actions for LCO 3.8.9, "Distribution Systems—Operating," must be immediately entered. This allows Condition F to provide requirements for the loss of one offsite circuit and one DG, without regard to whether a train is de-energized. LCO 3.8.9 provides the appropriate restrictions for a de-energized train.

According to Regulatory Guide 1.93 (Ref. 7), operation may continue in Condition F for a period that should not exceed 12 hours.

ACTIONS (continued)

In Condition F, individual redundancy is lost in both the offsite electrical power system and the onsite AC electrical power system. Since power system redundancy is provided by two diverse sources of power, however, the reliability of the power systems in this Condition may appear higher than that in Condition E (loss of two required offsite circuits). This difference in reliability is offset by the susceptibility of this power system configuration to a single bus or switching failure. The 12 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 DBA occurring during this period.

G.1

With two LCO 3.8.1.b DGs inoperable, there are no remaining standby AC sources to provide power to most of the ESF systems. With one LCO 3.8.1.b DG that provides power to the shared systems inoperable and one LCO 3.8.1.d DG that provides power to the shared systems inoperable, there are no remaining standby AC sources to the shared systems. Also, with two DGs required by LCO 3.8.1.d inoperable, there are no remaining standby AC sources to the two opposite unit NSWS pump(s) and at least one train of shared systems. Thus, with an assumed loss of offsite electrical power, insufficient standby AC sources are available to power the minimum required ESF functions. Since the offsite electrical power system is the only source of AC power for this level of degradation, the risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown (the immediate shutdown could cause grid instability, which could result in a total loss of AC power). Since any inadvertent generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

According to Reference 7, with both LCO 3.8.1.b DGs inoperable, with one LCO 3.8.1.b DG that provides power to the shared systems and one LCO 3.8.1.d DG that provides power to the shared systems inoperable, or with two DGs required by LCO 3.8.1.d inoperable, operation may continue for a period that should not exceed 2 hours.

H.1

The sequencer(s) is an essential support system to both the offsite circuit and the DG associated with a given ESF bus. Furthermore, the sequencer is on the primary success path for most major AC electrically

ACTIONS (continued)

powered safety systems powered from the associated ESF bus. Therefore, loss of an ESF bus sequencer affects every major ESF system in the train. When a sequencer is inoperable, its associated unit and train related offsite circuit and DG must also be declared inoperable and their corresponding Conditions must also be entered. The 12 hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining sequencer OPERABILITY. This time period also ensures that the probability of an accident (requiring sequencer OPERABILITY) occurring during periods when the sequencer is inoperable is minimal.

I.1 and I.2

If any Required Action and associated Completion Time of Conditions A, C, F, G, or H are not met, the unit must be brought to a MODE in which the LCO does not apply. Furthermore, if any Required Action and associated Completion Time of Required Actions B.2, B.3, B.4.1, B.4.2, B.6, D.2, D.3, D.4.1, D.4.2, and D.6 are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

J.1

Condition J corresponds to a level of degradation in which all redundancy in LCO 3.8.1.a and LCO 3.8.1.b AC electrical power supplies has been lost or in which all redundancy in LCO 3.8.1.c and LCO 3.8.1.d AC electrical power supplies has been lost. At this severely degraded level, any further losses in the AC electrical power system will cause a loss of function. Therefore, no additional time is justified for continued operation. The unit is required by LCO 3.0.3 to commence a controlled shutdown.

SURVEILLANCE REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, Appendix A, GDC 18 (Ref. 9). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 10), and Regulatory Guide 1.137 (Ref. 11), as

SURVEILLANCE REQUIREMENTS (continued)

addressed in the UFSAR.

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. The minimum steady state output voltage of 3950 V is 95% of the nominal 4160 V output voltage. This value allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 90% of name plate rating.

The specified maximum steady state output voltage of 4580 V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages.

The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations given in Regulatory Guide 1.9 (Ref. 3).

SR 3.8.1.1

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution buses and loads are connected to their preferred power source, and that appropriate independence of offsite circuits is maintained. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.2 and SR 3.8.1.7

These SRs help to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and to maintain the unit in a safe shutdown condition.

To minimize the wear on moving parts that do not get lubricated when the engine is not running, these SRs are modified by a Note (Note 2 for SR 3.8.1.2) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period and followed by a warmup period prior to loading.

SURVEILLANCE REQUIREMENTS (continued)

For the purposes of SR 3.8.1.2 and SR 3.8.1.7 testing, the DGs are started from standby conditions using a manual start, loss of offsite power signal, safety injection signal, or loss of offsite power coincident with a safety injection signal. Standby conditions for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

In order to reduce stress and wear on diesel engines, the manufacturer recommends a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. These start procedures are the intent of Note 3, which is only applicable when such modified start procedures are recommended by the manufacturer.

SR 3.8.1.7 requires that the DG starts from standby conditions and achieves required voltage and frequency within 11 seconds. The 11 second start requirement supports the assumptions of the design basis LOCA analysis in the UFSAR, Chapter 15 (Ref. 5).

The 11 second start requirement is not applicable to SR 3.8.1.2 (see Note 3) when a modified start procedure as described above is used. If a modified start is not used, the 11 second start requirement of SR 3.8.1.7 applies.

Since SR 3.8.1.7 requires a 11 second start, it is more restrictive than SR 3.8.1.2, and it may be performed in lieu of SR 3.8.1.2. This is the intent of Note 1 of SR 3.8.1.2.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

<u>SR 3.8.1.3</u>

This Surveillance verifies that the DGs are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the DG is connected to the offsite source.

Although no power factor requirements are established by this SR, the DG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while the 1.0 is an operational limitation to ensure circulating currents are minimized. The

SURVEILLANCE REQUIREMENTS (continued)

load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by four Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients, because of changing bus loads, do not invalidate this test. Similarly, momentary power factor transients above the limit do not invalidate the test. Note 3 indicates that this Surveillance should be conducted on only one DG at a time in order to avoid common cause failures that might result from offsite circuit or grid perturbations. Note 4 stipulates a prerequisite requirement for performance of this SR. A successful DG start must precede this test to credit satisfactory performance.

SR 3.8.1.4

This SR provides verification that the level of fuel oil in the day tank is at or above the level at which fuel oil is automatically added. The level is expressed as an equivalent volume in gallons, and is selected to ensure adequate fuel oil for a minimum of 1 hour of DG operation at full load plus 10%.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel oil day tanks eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and

SURVEILLANCE REQUIREMENTS (continued)

provides data regarding the watertight integrity of the fuel oil system. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. This SR is for preventative maintenance. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed during the performance of this Surveillance.

SR 3.8.1.6

This Surveillance demonstrates that each required fuel oil system operates and transfers fuel oil from its associated storage tanks to its associated day tank. This is required to support continuous operation of standby power sources. This Surveillance provides assurance that the fuel oil valve is OPERABLE, and allows gravity feed of fuel oil to the day tank from underground storage tanks, to ensure the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for fuel transfer systems are OPERABLE.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.7

See SR 3.8.1.2.

SR 3.8.1.8

Transfer of each 4.16 kV ESF bus power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the capability of the alternate circuit distribution network to power the shutdown loads. The alternate circuit distribution network consists of an offsite power source through a 6.9 kV bus incoming breaker, its associated 6.9 kV bus tie breaker and the aligned 6.9/4.16 kV transformer to the essential bus. The requirement of this SR is the transfer from the normal offsite circuit to the alternate offsite circuit via the automatic and manual actuation of the 6.9 kV bus tie breaker and 6.9 kV bus incoming breakers upon loss of the normal offsite source that is being credited. The 6.9 kV bus tie breaker provides a means for each of the offsite circuits to act as a backup in the event power is not available from one of the circuits. The Catawba power system design, without the tie breaker, meets all GDC 17 requirements as well as all other standards to which Catawba is committed. If the tie breaker is incapable of closing manually or automatically during its required MODE of applicability, then the

SURVEILLANCE REQUIREMENTS (continued)

Surveillance is not met and the normal offsite circuit that supplies that Class 1E ESF bus is inoperable and the applicable Condition shall be entered and the Required Actions shall be performed. Table B 3.8.1-1 identifies the offsite circuit affected by a non-functioning tie breaker.

The intent of the tie breaker is to provide an alternate means of power to a Class 1E ESF bus; this assumes there are two available offsite circuits. In the event an offsite circuit is lost for any reason, the function of the tie breaker is to close, and the offsite circuit that is supplying its normally connected Class 1E ESF bus is fully OPERABLE. With the tie breaker closed, then both Class 1E ESF buses are provided power from a single offsite circuit. The normally connected offsite circuit of the Class 1E ESF bus that is being supplied through the tie breaker shall be declared inoperable and the applicable Condition shall be entered and the Required Actions shall be performed. If the tie breaker does not close, then the associated Class 1E ESF bus will be supplied power from its associated DG. In this event, the associated offsite circuit is inoperable and the applicable Condition shall be entered and the Required Actions shall be performed. Capability of manually swapping to a standby transformer is not required to satisfy this SR. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

Table B 3.8.1-1 (page 1 of 1)
Relationship between Tie Breakers and Offsite Circuits

Tie Breaker	Description	Essential Load Center and Transformer	Affected Offsite Circuit
1TA-7	7kV Bus 1TA Tie Breaker	1ETA from 1ATC	1A
1TC-7	7kV Bus 1TC Tie Breaker	1ETA from SATA from Unit 1	
2TC-7	7kV Bus 2TC Tie Breaker	1ETA from SATA from Unit 2	
1TD-7	7kV Bus 1TD Tie Breaker	1ETB from 1ATD	1B
1TB-7	7kV Bus 1TB Tie Breaker	1ETB from SATB from Unit 1	
2TB-7	7kV Bus 2TB Tie Breaker	1ETB from SATB from Unit 2	
2TA-7	7kV Bus 2TA Tie Breaker	2ETA from 2ATC	2A
1TC-7	7kV Bus 1TC Tie Breaker	2ETA from SATA from Unit 1	
2TC-7	7kV Bus 2TC Tie Breaker	2ETA from SATA from Unit 2	
2TD-7	7kV Bus 2TD Tie Breaker	2ETB from 2ATD	2B
1TB-7	7kV Bus 1TB Tie Breaker	2ETB from SATB from Unit 1	
2TB-7	7kV Bus 2TB Tie Breaker	2ETB from SATB from Unit 2	

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.9

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. For this unit, the single load for each DG and its horsepower rating is as follows: Nuclear Service Water pump which is a 1000 H.P. motor. This Surveillance may be accomplished by:

a. Tripping the DG output breaker with the DG carrying greater than or equal to its associated single largest post-accident load while paralleled to offsite power, or while solely supplying the bus; or

b. Tripping its associated single largest post-accident load with the DG solely supplying the bus.

As required by Regulatory Guide 1.9 (Ref. 3), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint. The value of 63 Hz has been selected for the frequency limit for the load rejection and it is a more conservative limit than required by Reference 3.

The time, voltage, and frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 3) recommendations for response during load sequence intervals. The 3 seconds specified is equal to 60% of a typical 5 second load sequence interval associated with sequencing of the largest load. The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the maximum frequency excursion, while SR 3.8.1.9.b and SR 3.8.1.9.c are steady state voltage and frequency values to which the system must recover following load rejection. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note. In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, the Note requires that, if synchronized to offsite power, testing must be performed using a power factor ≤ 0.9. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.10

This Surveillance demonstrates the DG capability to reject a full load without overspeed tripping or exceeding the predetermined voltage limits. The DG full load rejection may occur because of a system fault or inadvertent breaker tripping. This Surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the DG experiences following a full load rejection and verifies that the DG does not trip upon loss of the load. These acceptance criteria provide for DG damage protection. While the DG is not expected to experience this transient during an event and continues to be available, this response ensures that the DG is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated.

Although not representative of the design basis inductive loading that the DG would experience, a power factor of approximately unity (1.0) is used for testing. This power factor is chosen in accordance with manufacturer's recommendations to minimize DG overvoltage damage during testing.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.11

As required by Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(1), 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 DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG autostart time of 11 seconds is derived from requirements of the accident analysis to respond to a design basis 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.

SURVEILLANCE REQUIREMENTS (continued)

The requirement to verify the connection and power supply of the emergency bus and autoconnected loads is intended to satisfactorily show the relationship of these loads to the DG 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, Emergency Core Cooling Systems (ECCS) injection valves are not desired to be stroked open, or high pressure injection systems are not capable of being operated at full flow, or residual heat removal (RHR) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG 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.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1, 2, 3, or 4 is further amplified to allow portions of 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, at a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial 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 portions of the Surveillance are performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.12

This Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time (11 seconds) from the design basis actuation signal (LOCA signal) and operates for ≥ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability. SR 3.8.1.12.d ensures that the emergency bus remains energized from the offsite electrical power system on an ESF signal without loss of offsite power.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. This SR is modified by a Note. The reason for the Note is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations.

SR 3.8.1.13

This Surveillance demonstrates that DG non-emergency protective functions (e.g., high jacket water temperature) are bypassed on a loss of voltage signal concurrent with an ESF actuation test signal. Non-emergency automatic trips are all automatic trips except:

a. Engine overspeed;
b. Generator differential current;
c. Low - low lube oil pressure; and
d. Voltage control overcurrent relay scheme.

The non-emergency trips are bypassed during DBAs and provide an alarm on an abnormal engine condition. This alarm provides the operator with sufficient time to react appropriately. The DG availability to mitigate the DBA is more critical than protecting the engine against minor problems that are not immediately detrimental to emergency operation of the DG. Currently, DG emergency automatic trips are tested periodically per the station periodic maintenance program.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.14

Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(3), requires demonstration that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours. The DG 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.

In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing must be performed using a power factor of ≤ 0.9. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This Surveillance is modified by a Note. The Note states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the power factor limit will not invalidate the test.

SR 3.8.1.15

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within 11 seconds. The 11 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The load band is provided to avoid routine overloading of the DG. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. The requirement that the diesel has operated for at least an hour at full load conditions prior to performance of this Surveillance is based on

SURVEILLANCE REQUIREMENTS (continued)

manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.

SR 3.8.1.16

As required by Regulatory Guide 1.108 (Ref. 10), paragraph 2.a.(6), this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and the DG can be returned to standby operation when offsite power is restored. It also ensures that the autostart logic is reset to allow the DG to reload if a subsequent loss of offsite power occurs. The DG is considered to be in standby operation when the DG is at rated speed and voltage, the output breaker is open and can receive an autoclose signal on bus undervoltage, and the load sequence timers are reset.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1, 2, 3, or 4 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, at 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, 2, 3, or 4. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.17

Demonstration of the test mode override ensures that the DG availability under accident conditions will not be compromised as the result of testing and the DG will automatically reset to standby operation if a LOCA actuation signal is received during operation in the test mode. Standby operation is defined as the DG running at rated speed and voltage with the DG output breaker open. These provisions for automatic switchover are required by Regulatory Guide 1.9 (Ref. 3).

The requirement to automatically energize the emergency loads with offsite power is essentially identical to that of SR 3.8.1.12. The intent in the requirement associated with SR 3.8.1.17.b is to show that the emergency loading was not affected by the DG operation in test mode. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the emergency loads 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.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1, 2, 3, or 4 is further amplified to allow portions of 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, at a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial 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 portions of the Surveillance are performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.18

Under accident and loss of offsite power conditions loads are sequentially connected to the bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The load sequence time interval tolerance in Table 8-6 of Reference 2 ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. Table 8-6 of Reference 2 provides a summary of the automatic loading of ESF buses.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.19

In the event of a DBA coincident with a loss of offsite power, the DGs are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded.

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.11, during a loss of offsite power actuation test signal in conjunction with an ESF actuation signal. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system 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.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations for DGs. The reason for Note 2 is that the performance of the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1, 2, 3, or 4 is further amplified to

SURVEILLANCE REQUIREMENTS (continued)

allow portions of 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, at a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial 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 portions of the Surveillance are performed in MODE 1, 2, 3, or 4. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.20

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper speed within the specified time when the DGs are started simultaneously.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. UFSAR, Chapter 8.
3. Regulatory Guide 1.9, Rev. 2, December 1979.
4. UFSAR, Chapter 6.
5. UFSAR, Chapter 15.
6. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
7. Regulatory Guide 1.93, Rev. 0, December 1974.
8. Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," July 2, 1984.
9. 10 CFR 50, Appendix A, GDC 18.
10. Regulatory Guide 1.108, Rev. 1, August 1977 (Supplement September 1977).
11. Regulatory Guide 1.137, Rev. 1, October 1979.
12. ASME, Boiler and Pressure Vessel Code, Section XI.
13. Response to a Request for Additional Information (RAI) concerning the June 5, 2006 License Amendment Request (LAR) Applicable to Technical Specification (TS) 3.8.1, "AC Sources-Operating," Surveillance Requirement (SR) 3.8.1.13, (TAC NOS. MD3217, MD3218, MD3219, and MD3220), April 4, 2007.
14. Branch Technical Position 8-8, February 2012.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 AC Sources—Shutdown

BASES

BACKGROUND

A description of the AC sources is provided in the Bases for LCO 3.8.1, "AC Sources—Operating."

APPLICABLE SAFETY ANALYSES

The OPERABILITY of the minimum AC sources during MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

During MODES 1, 2, 3, and 4, various deviations from the analysis assumptions and design requirements are allowed within the Required Actions. This allowance is in recognition that certain testing and maintenance activities must be conducted provided an acceptable level of

APPLICABLE SAFETY ANALYSES (continued)

risk is not exceeded. During MODES 5 and 6, performance of a significant number of required testing and maintenance activities is also required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO requirements are acceptable during shutdown modes based on:

a. The fact that time in an outage is limited. This is a risk prudent goal as well as a utility economic consideration.

b. Requiring appropriate compensatory measures for certain conditions. These may include administrative controls, reliance on systems that do not necessarily meet typical design requirements applied to systems credited in operating MODE analyses, or both.

c. Prudent utility consideration of the risk associated with multiple activities that could affect multiple systems.

d. Maintaining, to the extent practical, the ability to perform required functions (even if not meeting MODE 1, 2, 3, and 4 OPERABILITY requirements) with systems assumed to function during an event.

In the event of an accident during shutdown, this LCO ensures the capability to support systems necessary to avoid immediate difficulty, assuming either a loss of all offsite power or a loss of all onsite diesel generator (DG) power.

The AC sources satisfy Criterion 3 of 10 CFR 50.36 (Ref. 1).

LCO

One offsite circuit capable of supplying the onsite Class 1E power distribution subsystem(s) of LCO 3.8.10, "Distribution Systems—Shutdown," ensures that all required loads are powered from offsite power. An OPERABLE DG, associated with the distribution system train required to be OPERABLE by LCO 3.8.10, ensures a diverse power source is available to provide electrical power support, assuming a loss of the offsite circuit. Together, OPERABILITY of the required offsite circuit and DG ensures the availability of sufficient AC sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

LCO (continued)

The qualified offsite circuit must be capable of maintaining rated frequency and voltage, and accepting required loads during an accident, while connected to the Engineered Safety Feature (ESF) bus(es). Qualified offsite circuits are those that are described in the UFSAR and are part of the licensing basis for the unit.

The 4.16 kV essential system is divided into two completely redundant and independent trains designated A and B, each consisting of one 4.16 kV switchgear assembly, three 4.16 kV/600 V transformers, two 600 V load centers, and associated loads.

Normally, each Class 1E 4.16 kV switchgear is powered from its associated non-Class 1E train of the 6.9 kV Normal Auxiliary Power System as discussed in "6.9 kV Normal Auxiliary Power System" in Chapter 8 of the UFSAR. Additionally, an alternate source of power to each 4.16 kV essential switchgear is provided from the 6.9 kV system via two separate and independent 6.9/4.16 kV transformers. These transformers are shared between units and provide the capability to supply an alternate source of preferred power to each unit's 4.16 kV essential switchgear from either unit's 6.9 kV system. A key interlock scheme is provided to preclude the possibility of connecting the two units together at either the 6.9 or 4.16 kV level.

Each train of the 4.16 kV Essential Auxiliary Power System is also provided with a separate and independent emergency diesel generator to supply the Class 1E loads required to safely shut down the unit following a design basis accident. Additionally, each diesel generator is capable of supplying its associated 4.16 kV blackout switchgear through a connection with the 4.16 kV essential switchgear.

The DG must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus undervoltage. This sequence must be accomplished within 11 seconds. The DG must be capable of accepting required loads within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby at ambient conditions.

Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY.

LCO (continued)

In addition, proper sequencer operation is an integral part of offsite circuit OPERABILITY since its inoperability impacts on the ability to start and maintain energized loads required OPERABLE by LCO 3.8.10.

It is acceptable for trains to be cross tied during shutdown conditions, allowing a single offsite power circuit to supply all required trains.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

ACTIONS

A.1

An offsite circuit would be considered inoperable if it were not available to one required ESF train. Although two trains are required by LCO 3.8.10, the one train with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and fuel movement. By the allowance of the option to declare required features inoperable, with no offsite power available, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS.

ACTIONS (continued)

A.2.1, A.2.2, A.2.3, A.2.4, B.1, B.2, B.3, and B.4

With the offsite circuit not available to all required trains, the option would still exist to declare all required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With the required DG inoperable, the minimum required diversity of AC power sources is not available. It is, therefore, required to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions that could result in loss of required SDM (MODE 5) or required boron concentration (MODE 6). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limits is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability or the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC sources and to continue this action until restoration is accomplished in order to provide the necessary AC power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

Pursuant to LCO 3.0.6, the Distribution System's ACTIONS would not be entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A is entered with no AC power to any required ESF bus, the ACTIONS for LCO 3.8.10 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite circuit, whether or not a train is de-energized. LCO 3.8.10 would provide the appropriate restrictions for the situation involving a de-energized train.

SURVEILLANCE REQUIREMENTS

SR 3.8.2.1

SR 3.8.2.1 requires the SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the AC sources in other than MODES 1, 2, 3, and 4. SR 3.8.1.8 is not required to be met since only one offsite circuit is required to be OPERABLE. SRs 3.8.1.12 and 3.8.1.19 are not required to be met because the ESF signals, required for the SRs, are not required to be OPERABLE in MODES 5 or 6. SR 3.8.1.17 is not required to be met because the required OPERABLE DG(s) is not required to undergo periods of being synchronized to the offsite circuit. SR 3.8.1.20 is excepted because starting independence is not required with the DG(s) that is not required to be OPERABLE.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DG(s) from being paralleled with the offsite power network or otherwise rendered inoperable during performance of SRs, and to preclude deenergizing a required 4160 V ESF bus or disconnecting a required offsite circuit during performance of SRs. With limited AC sources available, a single event could compromise both the required circuit and the DG. It is the intent that these SRs must still be capable of being met, but actual performance is not required during periods when the DG and offsite circuit is required to be OPERABLE. Refer to the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

REFERENCES

1. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).

B 3.9 REFUELING OPERATIONS

B 3.9.3 Containment Penetrations

BASES

BACKGROUND

During movement of recently irradiated fuel assemblies (i.e., fuel assemblies that have occupied part of a critical reactor core within the previous 72 hours) within containment, a release of fission product radioactivity within containment will be restricted from escaping to the environment when the LCO requirements are met. In MODES 1, 2, 3, and 4, this is accomplished by maintaining containment OPERABLE as described in LCO 3.6.1, "Containment." In MODE 6, the potential for containment pressurization as a result of an accident is not likely; therefore, requirements to isolate the containment from the outside atmosphere can be less stringent. Since there is no potential for containment pressurization, the Appendix J leakage criteria and tests are not required.

The containment serves to contain fission product radioactivity that may be released from the reactor core following an accident, such that offsite radiation exposures are maintained within the acceptance criteria of 10 CFR 50.67 and Regulatory Guide 1.183. Additionally, the containment provides radiation shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment equipment hatch, which is part of the containment pressure boundary, provides a means for moving large equipment and components into and out of containment. During movement of recently irradiated fuel assemblies within containment, the equipment hatch must be held in place by at least four bolts. Good engineering practice dictates that the bolts required by this LCO be approximately equally spaced.

The containment air locks, which are also part of the containment pressure boundary, provide a means for personnel access during MODES 1, 2, 3, and 4 unit operation in accordance with LCO 3.6.2, "Containment Air Locks." Each air lock has a door at both ends. The doors are normally interlocked to prevent simultaneous opening when containment OPERABILITY is required. During periods of unit shutdown when containment closure is not required, the door interlock mechanism may be disabled, allowing both doors of an air lock to remain open for

BASES

BACKGROUND (continued)

extended periods when frequent containment entry is necessary. During movement of recently irradiated fuel assemblies within containment, containment closure is required; therefore, the door interlock mechanism may remain disabled, but one air lock door must always remain closed.

The requirements for containment penetration closure ensure that a release of fission product radioactivity within containment will be restricted from escaping to the environment. The closure restrictions are sufficient to restrict fission product radioactivity release from containment due to a fuel handling accident involving recently irradiated fuel during refueling.

The Containment Purge Exhaust System includes two trains. Purge air is exhausted from the containment through the Containment Purge Exhaust System to the unit vent where it is monitored for radioactivity level by the unit vent monitor prior to release to the atmosphere. The Containment Purge Exhaust System consists of two 50 percent capacity filter trains and fans. There is one purge exhaust duct penetration through the Reactor Building wall from the annulus area. There are three purge exhaust penetrations through the containment vessel, two from the upper compartment and one from the lower compartment. Two normally closed isolation valves at each penetration through the containment vessel provide containment isolation. One normally closed isolation damper at the Reactor Building wall provides annulus isolation.

The upper compartment purge exhaust ductwork is arranged to draw exhaust air into a plenum around the periphery of the refueling canal, effecting a ventilation sweep of the canal during the refueling process. The lower compartment purge exhaust ductwork is arranged so as to sweep the reactor well during the refueling process.

The other containment penetrations that provide direct access from containment atmosphere to outside atmosphere must be isolated on at least one side. Isolation may be achieved by an OPERABLE automatic isolation valve, or by a manual isolation valve, blind flange, or equivalent. Equivalent isolation methods must be approved and may include use of a material that can provide a temporary, atmospheric pressure, ventilation barrier for the other containment penetrations during recently irradiated fuel movements.

The Containment Purge Exhaust System heaters do not affect OPERABILITY of the Containment Purge Exhaust System filter trains because carbon adsorber efficiency testing is performed at 30°C and 95% relative humidity. Testing per ASTM D3803-1989 at 30°C and 95% relative humidity ensures that the filter efficiency is unaffected by moisture.

BASES

APPLICABLE SAFETY ANALYSES

During movement of recently irradiated fuel assemblies within containment, the most severe radiological consequences result from a fuel handling accident involving recently irradiated fuel. The fuel handling accident is a postulated event that involves damage to irradiated fuel (Ref. 1). Fuel handling accidents, analyzed in Reference 2, include dropping a single irradiated fuel assembly and handling tool or a heavy object onto other irradiated fuel assemblies. The requirements of LCO 3.9.6, "Refueling Cavity Water Level," and the minimum decay time of 72 hours without containment closure capability ensure that the release of fission product radioactivity, subsequent to a fuel handling accident, results in doses that are within the guideline values specified in 10 CFR 50.67 and Regulatory Guide 1.183.

Containment penetrations satisfy Criterion 3 of 10 CFR 50.36 (Ref. 3).

LCO

This LCO limits the consequences of a fuel handling accident involving handling recently irradiated fuel in containment by limiting the potential escape paths for fission product radioactivity released within containment. The LCO requires any penetration providing direct access from the containment atmosphere to the outside atmosphere to be closed except for penetrations exhausting through an OPERABLE Containment Purge Exhaust System HEPA filter and carbon adsorber during movement of recently irradiated fuel assemblies.

APPLICABILITY

The containment penetration requirements are applicable during movement of recently irradiated fuel assemblies within containment because this is when there is a potential for the limiting fuel handling accident. In MODES 1, 2, 3, and 4, containment penetration requirements are addressed by LCO 3.6.1. In MODES 5 and 6, when movement of recently irradiated fuel assemblies within containment is not being conducted, the potential for a limiting fuel handling accident does not exist. Therefore, under these conditions no requirements are placed on containment penetration status.

During movement of recently irradiated fuel assemblies, ventilation system and radiation monitor availability (as defined by NUMARC 91-06) should be assessed, with respect to filtration and monitoring of releases from the fuel. Following shutdown, radioactivity in the RCS decays fairly rapidly. The goal of maintaining ventilation system and radiation monitor availability is to reduce doses even further below that provided by the natural decay, and to avoid unmonitored releases.

A single normal or contingency method to promptly close primary or secondary containment penetrations exists. Such prompt methods need

BASES

APPLICABILITY (continued)

not completely block the penetration or be capable of resisting pressure. The purpose is to enable ventilation systems to draw the release from a postulated fuel handling accident in the proper directions such that it can be treated and monitored.

ACTIONS

A.1 and A.2

If the containment equipment hatch, air locks, or any containment penetration that provides direct access from the containment atmosphere to the outside atmosphere is not in the required status, the unit must be placed in a condition where the isolation function is not needed. This is accomplished by immediately suspending movement of recently irradiated fuel assemblies within containment. Performance of these actions shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

This Surveillance demonstrates that each of the containment penetrations required to be in its closed position is in that position. The Surveillance on the open purge and exhaust valves will demonstrate that the valves are exhausting through an OPERABLE Containment Purge Exhaust System HEPA Filter and carbon adsorber.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.9.3.2

Standby systems should be checked periodically to ensure that they function properly. Operation for ≥ 15 continuous minutes demonstrates OPERABILITY of the system. Periodic operation ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.9.3.3

This SR verifies that the required testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The Containment Purge Exhaust System filter tests are in accordance with Reference 4. The VFTP includes testing HEPA filter performance, carbon adsorbers efficiency, system flow rate, and the physical properties of the activated carbon (general use and following specific operations). Specific test Frequencies and additional information are discussed in detail in the VFTP.

REFERENCES

1. UFSAR, Section 15.7.4.
2. NUREG-0800, Section 15.7.4, Rev. 1, July 1981.
3. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
4. Regulatory Guide 1.52 (Rev. 2).
5. 10 CFR 50.67, Accident source term.
6. Regulatory Guide 1.183 (Rev. 0).
7. Catawba Nuclear Station License Amendments 90/84 for Units 1/2, August 23, 1991.

Enclosure 5

Catawba Nuclear Station
Selected Licensee Commitments (SLC) Manual Changes

Removal and insertion instructions for Catawba Nuclear Station Selected Licensee Commitments (SLC) Manual with the attached revised page(s) for the peried of December 4, 2018 thru February 1, 2020. The revised page(s) are identified by Section number and contains marginal lines indicating the areas of change.

REMOVE THESE PAGES		INSERT THESE PAGES
	LIST OF EFFECTIVE SECTIONS	
Pages 1-5 Revision 79		Pages 1-5 Revision 87
	TAB 16.5	
16.5-1, Pages 1-5 Revision 4		16.5-1, Pages 1-5 Revision 5
16.5-3 Revision 1		16.5-3 Revision 2
16.5-8 Revision 2		16.5-8 Deleted
	TAB 16.6	
16.6-4 Revision 1		16.6-4 Revision 2
	TAB 16.7	
16.7-3 Revision 4		16.7-3 Revision 5
16.7-10 Revision 7		16.7-10 Revision 8
	TAB 16.8	
16.8-2 Revision 2		16.8-2 Revision 3
	TAB 16.9	
16.9-1 Revision 9		16.9-1 Revision 10
16.9-5 Revision 10		16.9-5 Revision 11

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16.5-6	1	08/21/09
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16.5-9	2	11/06/18
16.5-10	Deleted	
16.6-1	0	10/09/02
16.6-2	Deleted	
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16.11-1	1	07/27/13

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16.11-3	0	10/09/02
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16.11-21	0	10/09/02
16.12-1	0	10/09/02
16.13-1	1	08/03/17
16.13-2	Deleted	
16.13-3	Deleted	

LIST OF EFFECTIVE SECTIONS

SECTION	REVISION NUMBER	REVISION DATE
16.13-4	2	03/11/18

16.5 REACTOR COOLANT SYSTEM

16.5-1 Reduced Inventory and Mid-Loop Operation with Irradiated Fuel in the Core

COMMITMENT

Two independent trains of reactor coolant system level instruments are required. These instruments shall have independent transmitters and shall not include the reactor coolant system sightglass (NCLG-6450) or tygon tubing.

AND

---------------------------------NOTES---------------------------------

1. Final disconnection of the last two core exit thermocouples shall occur no sooner than 2 hours prior to reactor vessel head removal.

2. Reconnection of at least two thermocouples shall occur within 2 hours after reinstalling the reactor vessel head.

3. The total time without thermocouple indication shall not exceed 12 hours.

Whenever the reactor vessel head is installed, two core exit thermocouples shall be maintained operating with temporary high alarms set at 140°F and monitored.

AND

---------------------------------NOTE---------------------------------

The number of open containment penetrations shall be limited such that the penetrations can be closed prior to the onset of core boiling upon loss of residual heat removal.

Containment closure shall be established. Containment closure is verified by the performance of PT/1/(2)/A/4200/002C&I, Containment Closure Verification, with penetrations not verified acceptable, administratively controlled per OP/0/A/6100/014, Penetration Control For Modes 5 and 6.

AND

The reactor has been subcritical for at least 7 days or Engineering has provided a required subcritical time based on plant operating history and actual reduced reactor coolant system level.

(continued)

COMMITMENT (continued)

AND

Operation in a mid-loop condition shall only occur during low decay heat conditions (after refueling).

AND

One of the following (either A. or B. or C. below):

A. Four power sources (two offsite sources and two diesel generators) and two independent makeup paths of borated water (one centrifugal charging pump or one safety injection pump as required per SLC 16.9-7 and SLC 16.9-9 and one additional centrifugal charging pump or safety injection pump on the opposite train as the first required makeup path) shall be available.

OR

B. Three power sources (two offsite sources and one diesel generator or one offsite source and two diesel generators), a hot leg vent path established per SLC 16.5-9 (the reactor vessel head removed or no hot leg nozzle dam installed coupled with the removal of the hot or the cold leg diaphragm and manway on the associated loop), and two independent makeup paths of borated water (one centrifugal charging pump or one safety injection pump as required per SLC 16.9-7 and SLC 16.9-9 and one of the following gravity flow paths: 1) refueling water storage tank through ND-33 to the cold legs via NI-173A or NI-178B, 2) refueling water storage tank through the residual heat removal suction lines to the hot legs, 3) refueling water storage tank through ND-33 to the hot legs via NI-183B) shall be available.

OR

C. Three power sources (two offsite sources and one diesel generator or one offsite source and two diesel generators), and two independent makeup paths of borated water, 1) one centrifugal charging pump or one safety injection pump as required per SLC 16.9-7 and SLC 16.9-9 AND 2) a gravity flow path from the refueling water storage tank through ND-33 to the cold legs via NI-173A or NI-178B shall be available. Additional conditions are, 1) the reactor has been refueled and shutdown for at least 10 days, 2) pressurizer is vented by at least one PZR

(continued)

COMMITMENT (continued)

Safety Valve removed and open to containment with an FME cover consistent with that described in CNC-1552.08-00-0510, and 3) FWST level is ≥ 86.0% (401.03 inches).

APPLICABILITY: Whenever irradiated fuel is in the reactor vessel and reactor coolant system wide range level is ≤ 16%.

REMEDIAL ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more COMMITMENT(S) not met.	A.1 Initiate action to restore compliance with COMMITMENT(S).	Immediately
	AND	
	A.2 Contact station management for additional guidance.	Immediately
B. Primary method of monitoring core exit thermocouples unavailable.	B.1 Monitor and record thermocouple temperatures on the Incore Instrument Panel.	Once per 15 minutes

TESTING REQUIREMENTS None

BASES

Generic Letter 88-17 and NUREG-1410 involve concerns associated with a loss of residual heat removal. Numerous events have occurred in the industry that resulted in a loss of residual heat removal during reduced inventory operation. This is of great concern due to the potential for substantial core damage occurring in a relatively short time period.

This Selected Licensee Commitment depicts those commitments which are extremely important to nuclear safety, however, are not presently covered by Technical Specifications.

The basis for the requirement for the reactor to be subcritical for 7 days is to ensure 2.5 hours until the core is uncovered following a loss of decay heat removal when at mid-loop operation (Refs. 10, 11).

REFERENCES

1. Generic Letter 88-17, "Loss of Decay Heat Removal."

2. NUREG-1410, "Loss of Vital AC Power and Residual Heat Removal during Mid-Loop Operation at Vogtle."

3. Nuclear System Directive 403, "Shutdown Risk Management (Modes 4, 5, 6, and No-Mode) per 10 CFR 50.65 (a)(4)."

REFERENCES (continued)

4. OP/1(2)/A/6150/06, "Draining the Reactor Coolant System."

5. Catawba Nuclear Station Technical Specifications.

6. Catawba Design Basis Specification for the Reactor Coolant (NC) System.

7. Oconee Nuclear Station Selected Licensee Commitment 16.5.3.

8. Work Processes Manual, Sections 602, "Outage Management," and 603, "Unit Trip Forced Outage Management."

9. Catawba Nuclear Station responses to Generic Letter 88-17 dated January 3, 1989.

10. Design Study CNDS-0242, "Catawba and McGuire Nuclear Stations, Shutdown by Decay Heat Level Before Mid-Loop Operation."

11. DPC-1552-08-00-0023, "Loss of Decay Heat Removal (G.L. 88-17)."

12. CNC-1552.08-00-0510, "Loss of Decay Heat Removal - Gravity Drain Flow Evaluation."

16.5 REACTOR COOLANT SYSTEM

16.5-3 Chemistry

COMMITMENT The Reactor Coolant System (RCS) chemistry shall be maintained within the limits specified in Table 16.5-3-1.

APPLICABILITY: At all times.

REMEDIAL ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more chemistry parameters in excess of its steady state limit but within its transient limit in MODE 1, 2, 3, or 4.	A.1 Restore the parameter to within steady state limit.	24 hours
B. One or more chemistry parameters in excess of its transient limit in MODE 1, 2, 3, or 4. OR Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

(continued)

REMEDIAL ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. ------------NOTE------------ All Required Actions must be completed whenever this Condition is entered. ------------------------------	C.1 Initiate action to reduce pressurizer pressure to ≤ 500 psig.	Immediately
RCS chloride or fluoride concentration not within steady state limits for more than 24 hours in any condition other than MODES 1, 2, 3, and 4. OR RCS chloride or fluoride concentration not within transient limits in any condition other than MODES 1, 2, 3, and 4.	AND C.2 Perform an engineering evaluation to determine the effects of the out-of-limit condition on the structural integrity of the RCS.	Prior to increasing pressurizer pressure > 500 psig OR Prior to entry to MODE 4
	AND C.3 Determine that the RCS remains acceptable for continued operation.	Prior to increasing pressurizer pressure > 500 psig OR Prior to entry to MODE 4

TESTING REQUIREMENTS

TEST		FREQUENCY
TR 16.5-3-1	Verify RCS chemistry is within limits.	72 hours

Table 16.5-3-1

RCS Chemistry Limits

PARAMETER	STEADY STATE LIMIT	TRANSIENT LIMIT
Dissolved Oxygen (1)	≤ 0.10 ppm	≤ 1.00 ppm
Chloride	≤ 0.15 ppm	≤ 1.50 ppm
Fluoride	≤ 0.15 ppm	≤ 1.50 ppm

(1) Limit and associated TESTING REQUIREMENT not applicable with $T_{avg} \leq 250°F$ or when Dissolved Hydrogen ≥ 15 cc/kg

BASES

The limitations on RCS chemistry ensure that corrosion of the RCS is minimized and reduces the potential for RCS leakage or failure due to stress corrosion. Maintaining the chemistry within the steady state limits provides adequate corrosion protection to ensure the structural integrity of the RCS over the life of the plant. The associated effects of exceeding the oxygen, chloride, and fluoride limits are time and temperature dependent. Corrosion studies show that operation may be continued with contaminant concentration levels in excess of the steady state limits, up to the transient limits, for the specified limited time intervals without having a significant effect on the structural integrity of the RCS. The time interval permitting continued operation within the restrictions of the transient limits provides time for taking corrective actions to restore the contaminant concentrations to within the steady state limits.

The Testing Requirements provide adequate assurance that concentrations in excess of the limits will be detected in sufficient time to take corrective action.

REFERENCES

1. Letter from NRC to Gary R. Peterson, Duke, Issuance of Improved Technical Specifications Amendments for Catawba, September 30, 1998.

2. Catawba UFSAR, Section 18.2.4.

3. Catawba License Renewal Commitments, CNS-1274.00-00-0016, Section 4.5.

16.6 ENGINEERED SAFETY FEATURES

16.6-4 Chlorine Detectors and Associated Circuitry

COMMITMENT Four chlorine detectors and associated circuitry (two per control room intake), with their Alarm Setpoints adjusted to actuate at a chlorine concentration of ≤ 5 ppm, shall be FUNCTIONAL.

APPLICABILITY: All MODES.

REMEDIAL ACTIONS

---NOTE---
SLC 16.2.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One chlorine detector and/or associated circuitry non-functional in one or both control room intakes.	A.1 Restore the non-functional equipment to FUNCTIONAL status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 ------------NOTE------------ With both intakes isolated, both Control Room Area Ventilation System (CRAVS) trains are inoperable and the applicable Conditions and Required Actions of Technical Specification 3.7.10 shall be entered and followed. ------------------------------ Isolate affected control room intake(s).	1 hour

(continued)

REMEDIAL ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Both chlorine detectors and/or associated circuitry non-functional in one or both control room intakes.	C.1 -------------NOTE-------------- With both intakes isolated, both CRAVS trains are inoperable and the applicable Conditions and Required Actions of Technical Specification 3.7.10 shall be entered and followed. ---------------------------------- Isolate affected control room intake(s).	Immediately

TESTING REQUIREMENTS

TEST		FREQUENCY
TR 16.6-4-1	Perform COT.	6 months
TR 16.6-4-2	Perform CHANNEL CALIBRATION.	18 months

BASES

The FUNCTIONALITY of the chlorine detectors and associated circuitry is provided as a defense-in-depth measure to ensure that sufficient capability is available to promptly detect and respond to an accidental chlorine release. The capability for the protection of control room personnel is consistent with the recommendations of Regulatory Guide 1.95, Revision 1, January 1977, "Protection of Nuclear Power Plant Control Room Operators Against an Accidental Chlorine Release."

Regulatory Guide 1.95 states in Section C.2 that the capability to manually isolate the control room should be provided "... if a chlorine container having an inventory of 150 lbs. or less is stored more than 100 meters from the control room or its fresh air intakes...." All chlorine containers at Catawba are stored or used at least 158 meters (520 feet) from the nearest control room outside air intake and the inventory of chlorine in any single "container" is less than or equal to 100 lbs. (Note that Catawba only uses 50-lb. cylinders with a maximum of two cylinders manifolded together.) Thus, automatic isolation/closure of an intake is

BASES (continued)

not required and it is acceptable to leave an intake open for a limited time period even if a single detector on an intake were to alarm. This follows the implied logic of the Regulatory Guide that if the quantity of gaseous chlorine onsite is small enough, it is not credible to assume a chlorine container failure results in a significant impact to the control room. This position is documented in calculation CNC-1211.00-00-0124.

The REMEDIAL ACTIONS described above are consistent with the guidance provided in Regulatory Guide 1.78, Revision 0, June 1974, "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release," and Regulatory Guide 1.95. Regulatory Guide 1.78 states in Section C.3 that "... the release of any hazardous chemical to be stored on the nuclear plant site in a quantity greater than 100 lbs. should be considered..." for its impact on control room habitability. Catawba does not allow any gaseous chlorine containers greater than 100 lbs. on site. There are also no credible accident scenarios that would cause the failure of more than 100 lbs. of chlorine.

REFERENCES

1. Letter from NRC to Gary R. Peterson, Duke, Issuance of Improved Technical Specifications Amendments for Catawba, September 30, 1998.

2. Letter from NRC to G.R. Peterson, Duke, Issuance of Amendments 191/183, June 28, 2001.

16.7 INSTRUMENTATION

16.7-3 Meteorological Instrumentation

COMMITMENT

a. The meteorological monitoring instrumentation channels shown in Table 16.7-3-1 shall be FUNCTIONAL.

AND

b. The meteorological monitoring instrumentation channels shown in Table 16.7-3-2 shall be maintained to ensure 90% data recovery on an annual basis.

APPLICABILITY: At all times.

REMEDIAL ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required meteorological monitoring channel(s) non-functional.	A.1 Restore non-functional channel(s) to FUNCTIONAL status.	7 days
	OR	
	A.2 Prepare and submit a Special Report to the Commission outlining the cause of the malfunction and the plans for restoring the channel(s) to FUNCTIONAL status.	17 days
B. One or more required meteorological monitoring channel(s) having < 90% annual data recovery.	B.1 Prepare and submit a Special Report to the Commission outlining the cause of the deficiency and the plans for restoring the annual data recovery goals.	Within 10 days of determining the missed requirement

TESTING REQUIREMENTS

-----NOTE-----
Refer to Table 16.7-3-1 to determine which TRs apply for each meteorological instrument.

TEST		FREQUENCY
TR 16.7-3-1	Perform CHANNEL CHECK.	24 hours
TR 16.7-3-2	Perform instrument calibration.	6 months
TR 16.7-3-3	Perform recorder time accuracy and channel zero and full scale checks.	14 days

Table 16.7-3-1

Meteorological Monitoring Instrumentation

	INSTRUMENT AND LOCATION	REQUIRED CHANNELS	TESTING REQUIREMENTS
1.	Wind Speed		
1.a	Meteorological Tower Nominal Elev. 663.5'	1	TR 16.7-3-1 TR 16.7-3-2 TR 16.7-3-3
1.b	Meteorological Tower Nominal Elev. 830.5'	1	TR 16.7-3-1 TR 16.7-3-2 TR 16.7-3-3
2.	Wind Direction		
2.a	Meteorological Tower Nominal Elev. 663.5'	1	TR 16.7-3-1 TR 16.7-3-2 TR 16.7-3-3
2.b	Meteorological Tower Nominal Elev. 830.5'	1	TR 16.7-3-1 TR 16.7-3-2 TR 16.7-3-3
3.	Air Temperature		
3.a	Ambient Meteorological Tower Nominal Elev. 660.25'	1	TR 16.7-3-1 TR 16.7-3-2 TR 16.7-3-3
3.b	Delta Temperature Meteorological Tower Nominal Elev. 827.25-660.25'	1	TR 16.7-3-1 TR 16.7-3-2 TR 16.7-3-3
3.c	Dew Point Meteorological Tower Nominal Elev. 660.25'	1	TR 16.7-3-1 TR 16.7-3-2 TR 16.7-3-3
4.	Precipitation (1)		
4.a	Precipitation Sensor Pad (Near Meteorological Tower) Nominal Elev. 630.0'	1	TR 16.7-3-1 TR 16.7-3-2 TR 16.7-3-3

(1) Not required by Regulatory Guide 1.23, Revision 0.

Table 16.7-3-2

Meteorological Monitoring Instrumentation Data Recovery Requirements

	INSTRUMENT AND LOCATION	TYPE
1.	60M Joint Data Recovery	Joint
1.a	Wind Speed Nominal Elev. 830.5'	
1.b	Wind Direction Nominal Elev. 830.5'	
1.c	Delta Temperature Nominal Elev. 827.25-660.25'	
2.	10M Joint Data Recovery	Joint
2.a	Wind Speed Nominal Elev. 663.5'	
2.b	Wind Direction Nominal Elev. 663.5'	
2.c	Delta Temperature Nominal Elev. 827.25-660.25'	
3.a	Ambient Air Temperature Nominal Elev. 660.25'	Individual
3.b	Dew Point Nominal Elev. 660.25'	Individual
4.	Precipitation Nominal Elev. 630.0'	Individual

BASES

The FUNCTIONALITY of the meteorological instrumentation ensures that sufficient meteorological data is available for estimating potential radiation doses to the public as a result of routine or accidental release of radioactive materials to the atmosphere. This capability is required to evaluate the need for initiating protective measures to protect the health and safety of the public and is consistent with the recommendations of Regulatory Guide 1.23, "Onsite Meteorological Programs," February 1972, for wind speed, wind direction, and air temperature at two elevations. Since Catawba uses cooling towers, instrumentation has been provided for measuring the dew point (humidity). Precipitation is not required by Regulatory Guide 1.23, Revision 0. However, it is monitored since it is used by the model for offsite dose assessment calculations.

With respect to the control room chart recorder, the regulatory guide states:

Either analog (strip chart) or digital recording of data may be used as a basis for analysis. In lieu of providing redundant digital recorders, digital outputs may be supplemented by strip chart recorders to minimize possible loss of data due to instrument malfunction. Recorders (analog or digital) for wind direction and speed and temperature difference (two temperatures or one temperature difference measurement on a tower or mast) should be located in the reactor control room for use during plant operation.

Thus, the chart recorder in the control room is required in order to comply with the regulatory guide.

An instrument calibration will consist of the following test:

1) A bench based test, certification, and/or calibration of the tower mounted sensors for:
   - wind speed
   - wind direction
   - ambient and delta temperature RTDs
2) An instrument loop calibration from the input of the signal processors to the end devices. The identification of an out-of-tolerance condition or failure of a component within the instrument loop renders the channel non-functional until the component is calibrated or repaired/replaced.
3) For wind direction a line phase differential compensation will be performed, which includes the tower signal cable.
4) For precipitation, a measured volume of water will be poured into the sensor and the signal conditioner module's output verified correct.
5) A CHANNEL CHECK, subsequent to any work performed. This will verify continuity of the signal cable between the sensor and signal processors.

BASES (continued)

6) The wind speed sensors and cup-sets or wind direction sensors and vanes do not require wind tunnel testing as an assembly.
7) Replacement of cup-sets or vanes does not require an instrument calibration of the affected channel.

The greater than or equal to 90% annual data recovery requirement is to ensure that the meteorological instrumentation is maintained to minimize extended periods of instrument outage. The reporting cycle is a calendar year (January 1 through December 31). A 60-day period from the end of the calendar year is allowed for data reduction, validation, and data quality assurance, before the data recovery report is generated.

The 90% data recovery is a statistical analysis of the respective data for the required parameters. This analysis includes out-of-service time resulting from components being in Condition A of this SLC and routine calibration/servicing time.

The recorder time accuracy and channel zero and full scale checks, as required by Reference 2, facilitate the 90% data recovery by ensuring meteorological instruments are inspected and serviced in order to expeditiously identify problems and minimize extended periods of instrument outage.

REFERENCES

1. Regulatory Guide 1.23, Revision 0.

2. Catawba Updated Final Safety Analysis Report, Section 2.3.3.3.

16.7 INSTRUMENTATION

16.7-10 Radiation Monitoring for Plant Operations

COMMITMENT The radiation monitoring instrumentation channels for plant operations shown in Table 16.7-10-1 shall be FUNCTIONAL.

APPLICABILITY: As shown in Table 16.7-10-1.

REMEDIAL ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more radiation monitoring channels Alarm/Trip setpoint for plant operations exceeding the value shown in Table 16.7-10-1.	A.1 Adjust the setpoint to within the limit. OR A.2 Declare the channel non-functional.	4 hours 4 hours

(continued)

REMEDIAL ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One Containment Atmosphere – High Gaseous Radioactivity (EMF-39 – Low Range) channel non-functional.	B.1 ------------NOTE------------ In order to utilize Required Action B.1, the following conditions must be satisfied: 1. The affected unit is in MODES 5 or 6. 2. EMF-36 is FUNCTIONAL and in service for the affected unit. 3. The Reactor Coolant System for the affected unit has been vented. 4. Either the reactor vessel head is in place (bolts are not required), or if it is not in place, the lifting of heavy loads over the reactor vessel and the movement of irradiated fuel assemblies within containment have been suspended. -------------------------------- Restore the non-functional channel to FUNCTIONAL status.	12 hours

(continued)

REMEDIAL ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met. OR Required Action B.1 not utilized.	C.1 Close the Containment Purge Exhaust System (CPES) valves.	Immediately
D. One Control Room Air Intake – Radiation Level – High Gaseous Radioactivity (EMF-43A & B – Low Range) channel non-functional in one or both control room intakes.	D.1 Initiate action to restore non-functional channel(s) to FUNCTIONAL status. AND D.2 Ensure that one Control Room Area Ventilation System (CRAVS) train is in operation.	Immediately 1 hour
E. One Fuel Storage Pool Area – Radiation Level (1EMF-15, 2EMF-4) channel non-functional.	E.1 Provide a portable continuous monitor with the same Alarm Setpoint in the fuel storage pool area. AND E.2.1 Restore non-functional monitor to FUNCTIONAL status. OR E.2.2 Suspend all operations involving fuel movement in the fuel building.	Immediately 30 days 30 days

(continued)

REMEDIAL ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One Fuel Storage Pool Area – High Gaseous Radioactivity (EMF-42) channel non-functional.	F.1.1 Initiate action to restore non-functional channel to FUNCTIONAL status.	Immediately
	AND	
	F.1.2 -------------NOTE------------ Only applicable during fuel handling operations in the fuel building. ----------------------------------- Ensure one Fuel Handling Ventilation Exhaust System (FHVES) train is in operation and all operating FHVES trains are in the filtered mode.	Immediately
	OR	
	F.2 Suspend all operations involving fuel movement in the fuel building.	Immediately
G. One Auxiliary Building Ventilation – High Gaseous Radioactivity (EMF-41) channel non-functional.	G.1 Ensure one Auxiliary Building Filtered Ventilation Exhaust System (ABFVES) train is OPERABLE and in operation in the filtered mode for each unit that requires an OPERABLE ABFVES.	Immediately
	AND	
	G.2 Ensure all other operating ABFVES trains are in the filtered mode.	Immediately

(continued)

REMEDIAL ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. One Component Cooling Water System (EMF-46A & B) channel non-functional.	H.1 Collect and analyze grab samples for principal gamma emitters (listed in Table 16.11-1-1, NOTE 3) at a lower limit of detection of no more than $5x10^{-7}$ μCi/ml.	Once per 12 hours
	AND	
	H.2 Restore non-functional channel to FUNCTIONAL status.	30 days
I. One or more N-16 Leakage Monitor (EMF-71, 72, 73, & 74) channels non-functional.	I.1 Ensure that the Condenser Evacuation System Noble Gas Activity Monitor (EMF-33) is FUNCTIONAL and in operation.	Immediately
	OR	
	I.2 Ensure that Required Actions are met per SLC 16.11-7 if the Condenser Evacuation System Noble Gas Activity Monitor (EMF-33) is non-functional or not in operation.	Immediately
J. One Auxiliary Building Cooling Water System (EMF-89) channel non-functional.	J.1 Collect and analyze grab samples for principal gamma emitters (listed in Table 16.11-1-1, NOTE 3) at a lower limit of detection of no more than $5x10^{-7}$ μCi/ml.	Once per 7 days
	AND	
	J.2 Restore non-functional channel to FUNCTIONAL status.	30 days

TESTING REQUIREMENTS

---NOTE---

Refer to Table 16.7-10-1 to determine which TRs apply for each Radiation Monitoring for Plant Operations channel.

TEST	FREQUENCY
TR 16.7-10-1 Perform CHANNEL CHECK.	12 hours
TR 16.7-10-2 Perform CHANNEL OPERATIONAL TEST.	9 months
TR 16.7-10-3 Perform CHANNEL CALIBRATION.	18 months

Table 16.7-10-1

Radiation Monitoring Instrumentation for Plant Operations

MONITOR	APPLICABLE MODES	REQUIRED CHANNELS	ALARM/TRIP SETPOINT	TESTING REQUIREMENTS
1. Containment Atmosphere – High Gaseous Radioactivity (EMF-39 – Low Range)	1, 2, 3, 4, 5, 6	1	Note (a)	TR 16.7-10-1 TR 16.7-10-2 TR 16.7-10-3
2. Fuel Storage Pool Areas – High Gaseous Radioactivity (EMF-42)	With irradiated fuel in the fuel storage pool areas	1	$\leq 1.7 \times 10^{-4}$ µCi/ml	TR 16.7-10-1 TR 16.7-10-2 TR 16.7-10-3
3. Fuel Storage Pool Areas – Radiation Level (Fuel Bridge – 1EMF-15, 2EMF-4)	With fuel in the fuel storage pool areas	1	$\leq$ 15 mR/h Note (d)	TR 16.7-10-1 TR 16.7-10-2 TR 16.7-10-3
4. Control Room Air Intake – Radiation Level – High Gaseous Radioactivity (EMF-43A & B – Low Range)	At all times	2 (1/intake)	$\leq 1.7 \times 10^{-4}$ µCi/ml	TR 16.7-10-1 TR 16.7-10-2 TR 16.7-10-3
5. Auxiliary Building Ventilation – High Gaseous Radioactivity (EMF-41)	1, 2, 3, 4	1	$\leq 1.7 \times 10^{-4}$ µCi/ml	TR 16.7-10-1 TR 16.7-10-2 TR 16.7-10-3
6. Component Cooling Water System (EMF-46A & B)	At all times[(e)]	1[(b)]	$\leq 1 \times 10^{-3}$ µCi/ml	TR 16.7-10-1 TR 16.7-10-2 TR 16.7-10-3
7. N-16 Leakage Monitor (EMF-71, 72, 73, & 74)	1 (40-100% reactor power)	4 (1/steamline)	Note (c)	TR 16.7-10-1 TR 16.7-10-2 TR 16.7-10-3
8. Auxiliary Building Cooling Water System (EMF-89)	At all times	1	$\leq 1 \times 10^{-3}$ µCi/ml	TR 16.7-10-1 TR 16.7-10-2 TR 16.7-10-3

Table 16.7-10-1 Notes

(a) When venting or purging from containment to the atmosphere, the trip setpoint shall not exceed the equivalent limits of SLC 16.11-6 in accordance with the methodology and parameters in the ODCM. When not venting or purging in Modes 5 or 6, the alarm setpoint concentration (μCi/ml) shall be such that the actual submersion dose rate would not exceed 5 mR/hr without alarm. When not venting or purging in Modes 1 through 4, the alarm setpoint shall be no more than 3 times the containment atmosphere activity as indicated by the radiation monitor.

(b) For EMF-46A & B: The EMF monitor associated with the operating Component Cooling Water System train shall be FUNCTIONAL. This requirement is based on the existence of an interlock which blocks the EMF loss of flow alarm from being received in the control room when the associated train pump motor(s) are not running.

(c) The setpoint is as required by the primary to secondary leak rate monitoring program.

(d) Catawba's Spent Fuel Pools were originally licensed for compliance with 10 CFR 70.24. The basis for the 15 mR/hr setpoint can be found in 10 CFR 70.24(a)(2) which states, in part, "... The monitoring devices in the system shall have a preset alarm point of not less than 5 millirems per hour (in order to avoid false alarms) nor more than 20 millirems per hour. ..." Although Catawba received exemption from 10 CFR 70.24 in 1997, the 15 mR/hr setpoint limit for detection of inadvertent criticality in the Spent Fuel Pool is still appropriate. Catawba is presently committed to compliance with 10 CFR 50.68 which requires, in part, "(6) Radiation monitors are provided in storage and associated handling areas when fuel is present to detect excessive radiation levels and initiate appropriate safety actions."

Therefore, the setpoint may be elevated, using approved plant procedures, above 15 mR/hr during Independent Spent Fuel Storage Installation (ISFSI) Transportable Storage Container (TSC) transfer activities when the loaded TSC may generate dose rates in excess of 15 mR/hr at the detector location. The setpoint shall be returned to ≤ 15 mR/hr upon completion of the TSC transfer.

(e) The Component Cooling Water (CCW) radiation monitors are not considered to be non-functional just because there is no CCW flow through their respective trains. The EMFs would be considered non-functional if one of the inlet/outlet CCW isolation valves to the EMF were closed, if the EMF itself was not functioning properly, or if preventive maintenance/calibration activities were being performed on the EMF rendering it out of service. For the situation where the associated train related CCW pumps are not running and a section of the CCW System (e.g., CCW heat exchanger) has been isolated and drained such that the associated radiation monitor has no process fluid to monitor, grab samples are not required.

BASES

The FUNCTIONALITY of the radiation monitoring instrumentation for plant operations ensures that: (1) the associated action will be initiated when the radiation level monitored by each channel or combination thereof reaches its setpoint, (2) the specified coincidence logic is maintained, and (3) sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance. The radiation monitors for plant operations senses radiation levels in selected plant systems and locations and determines whether or not predetermined limits are being exceeded. The radiation monitors send actuation signals to initiate alarms or automatic isolation action and actuation of emergency exhaust or ventilation systems. Some of the final actuations are dependent on plant condition in addition to the actuation signals from the radiation monitors.

Operation of the Component Cooling Water (CCW) System Train A with the Train A Radiation Monitoring System (EMF) monitor non-functional and relying on the Train B EMF monitor for detection of radioactivity is not permissible. Likewise, operation of the CCW System Train B with the Train B EMF monitor non-functional and relying on the Train A EMF monitor for detection of radioactivity is not permissible. This is due to the interlock between the EMF monitor low-flow alarm and the operation of the CCW System pump motors on the same train. The EMF monitor in the operating CCW System pump train must be FUNCTIONAL, or the compensatory measures taken as specified.

In MODES 5 and 6, initiation of the Containment Purge Exhaust System (CPES) with EMF-39 non-functional is not permissible. The basis for Required Action B.1 is to allow the continued operation of the CPES with EMF-39 initially FUNCTIONAL. Continued operation of the CPES is contingent upon the ability of the affected unit to meet the requirements as noted in Required Action B.1.

REFERENCES

1. Letter from NRC to Gary R. Peterson, Duke, Issuance of Improved Technical Specifications Amendments for Catawba, September 30, 1998.

2. Letter from NRC to M. S. Tuckman, Duke, Issuance of Exemption to 10 CFR 70.24, Criticality Accident Requirements, July 29, 1997.

16.8 ELECTRICAL POWER SYSTEMS

16.8-2 230 kV Switchyard Systems

COMMITMENT

The following switchyard equipment shall be in its normal alignment:

a. Switchyard Unit 1 PCBs 14, 15, 17, and 18 including their associated manual disconnects, current transformers, interconnecting bus, and support structures (EBA system),

b. Switchyard Unit 2 PCBs 20, 21, 23, and 24 including their associated manual disconnects, current transformers, interconnecting bus, and support structures (EBA system),

c. Buslines 1A, 1B (from main stepup transformers to switchyard unit PCBs), including their associated motor operated disconnects, coupling capacitor voltage transformers, interconnecting bus, and support structures (EBA system),

d. Buslines 2A, 2B (from main stepup transformers to switchyard unit PCBs), including their associated motor operated disconnects, coupling capacitor voltage transformers, interconnecting bus, and support structures (EBA system),

e. Controls associated with the equipment above (EBE, ERE systems),

f. Protective relaying associated with the equipment above (EBD, ERD systems),

g. 480 VAC auxiliary power load centers STA for both units' Train A, STB for both units' Train B (EBI system), and

h. 125 VDC auxiliary power (EBH system) per SLC 16.8-3.

APPLICABILITY:

At all times in accordance with Technical Specifications (all MODES) and Nuclear System Directive 403 (MODES 4, 5, 6, and No-MODE).

REMEDIAL ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Switchyard equipment not in normal COMMITMENT alignment.	A.1 Return switchyard equipment to normal COMMITMENT alignment.	In accordance with the Electronic Risk Assessment Tool

TESTING REQUIREMENTS None

BASES

Effective implementation of the Maintenance Rule, 10 CFR 50.65, requires the continuous assessment of systems determined to be risk significant in the protection against core damage or radiation release. It has been determined through probabilistic risk assessment (PRA) numerical methods that switchyard systems are risk significant from the standpoint of causing or being able to recover from Loss of Offsite Power events. This SLC serves two purposes. It defines the risk significant portions of the switchyard. It also provides a method of tracking the switchyard systems for the purposes of supporting 10 CFR 50.65.

REFERENCES

1. 10 CFR 50.65, Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants.
2. Deleted.
3. Deleted.
4. CNC-1535.00-00-0008, Severe Accident Analysis Report, CNS PRA Risk Significant SSCs for the Maintenance Rule.
5. CNS-010.01-EB-0001, Switchyard Design Basis Specification.
6. Technical Specification sections 3.8.1 and 3.8.2, LCOs for AC Power Sources during Operating and Shutdown MODES.
7. AD-WC-CNS-0420, "Catawba Nuclear Station Shutdown Risk Management."

16.9 AUXILIARY SYSTEMS

16.9-1 Fire Suppression Water System

COMMITMENT The Fire Suppression Water System shall be FUNCTIONAL with:

a. At least three fire suppression pumps, each with a capacity of 2500 gpm, with their discharge aligned to the fire suppression header, and

b. A FUNCTIONAL flow path capable of taking suction from Lake Wylie and transferring the water through distribution piping with FUNCTIONAL sectionalizing valves and isolation valves for each sprinkler/spray system, hose standpipe, or fire hydrant required to be FUNCTIONAL per SLCs 16.9-2, 16.9-4, and 16.9-23.

APPLICABILITY: At all times.

REMEDIAL ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One pump and/or associated water supply non-functional.	A.1 Restore non-functional pump and/or associated water supply to FUNCTIONAL status.	30 days
	OR	
	A.2 Provide alternate backup pump or supply.	30 days
B. Two pumps and/or associated water supplies non-functional.	B.1 Restore at least one non-functional pump and/or associated water supply to FUNCTIONAL status.	7 days
	OR	
	B.2 Provide alternate backup pump or supply	7 days

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Automatic starting function for all pumps non-functional.	C.1 Place at least one pump in continuous operation.	Immediately
	AND	
	C.2 Restore non-functional equipment to FUNCTIONAL status.	7 days
D. Sectionalizing or isolation valve non-functional.	D.1 Evaluate impact on downstream fire suppression features (sprinkler system, hose standpipe, or fire hydrant) and enter SLCs 16.9-2, 16.9-4, and 16.9-23 as necessary.	24 hours
	AND	
	D.2 Implement necessary administrative controls to ensure a FUNCTIONAL flow path is maintained.	24 hours
E. Fire Suppression Water System non-functional for reasons other than Condition A, B, C, or D.	E.1 Establish backup Fire Suppression Water System.	24 hours

TESTING REQUIREMENTS

TEST		FREQUENCY
TR 16.9-1-1	Start each electric motor-driven pump and operate it for ≥ 15 minutes on recirculation flow.	21 days on a STAGGERED TEST BASIS
TR 16.9-1-2	Verify that each manual, power operated, or automatic valve in the flow path, which is accessible during plant operation, is in the correct position.	In accordance with performance based criteria in BASES
TR 16.9-1-3	Perform a system flush of the outside distribution loop and verify no flow blockage by fully opening the hydraulically most remote hydrant.	6 months
TR 16.9-1-4	-------------------------------NOTE------------------------------- Not applicable to valves RF389B, RF447B, and RF457B. -- Cycle each testable valve in the flow path through at least one complete cycle of full travel.	12 months
TR 16.9-1-5	Verify that each manual, power operated, or automatic valve in the flow path, which is inaccessible during plant operation, is in the correct position.	18 months
TR 16.9-1-6	Perform a system functional test, including simulated automatic actuation of the system throughout its operating sequence, and: a. Verify that each fire suppression pump starts within 10 psig of its intended starting pressure (A pump, primary switch – 95 psig; B pump, primary switch – 90 psig; and C pump, primary switch – 85 psig); and b. Verify that each pump develops ≥ 2500 gpm at a net pressure ≥ 144 psig by testing at three points on the pump performance curve.	18 months

(continued)

TESTING REQUIREMENTS (continued)

	TEST	FREQUENCY
TR 16.9-1-7	Cycle each valve in the flow path which is not testable during plant operation through at least one complete cycle of full travel.	18 months
TR 16.9-1-8	Perform a system flow test in accordance with Chapter 8, Section 16 of the National Fire Protection Association Fire Protection Handbook, 15th Edition.	3 years

BASES

The FUNCTIONALITY of the Fire Suppression Systems ensures that adequate fire suppression capability is available to confine and extinguish fires occurring in any portion of the facility where equipment important to safety is located. The Fire Suppression System consists of the water supply/distribution system, sprinkler/spray systems, fire hose stations, fire hydrants, and CO_2 systems. The collective capability of the Fire Suppression Systems is adequate to minimize potential damage to equipment important to safety and is a major element in the facility Fire Protection Program.

Two of the three full capacity (2500 gpm) fire suppression pumps have Class 1E emergency power (Emergency Diesel Generator) as backup (B and C fire suppression pumps). Therefore, with any one fire suppression pump non-functional, at least one remaining fire suppression pump is backed by emergency power. A 30 day REQUIRED ACTION COMPLETION TIME is set to minimize any single failure vulnerability. With two fire suppression pumps non-functional, a shorter 7 day REQUIRED ACTION COMPLETION TIME is allowed. If the COMPLETION TIME is exceeded or all three required pumps are non-functional, then an alternate pump or supply must be provided. An acceptable alternate pump or supply may consist of having an adequate capacity portable pump aligned to the RF/RY system in a standby readiness state.

The intent of COMMITMENT b. is to ensure a FUNCTIONAL flow path from the water source (in this case Lake Wylie), through FUNCTIONAL pumps as required in COMMITMENT a., and through the main header distribution piping – up to and including the branch lines for each sprinkler/spray system, hose standpipe, or fire hydrant required to be FUNCTIONAL per SLCs 16.9-2, 16.9-4, and 16.9-23. When a sectionalizing valve or an isolation valve becomes non-functional, then the fire suppression features (sprinkler/spray system, hose standpipe, or fire hydrant) affected must be evaluated and the applicable SLCs entered (16.9-2, 16.9-4, and 16.9-23). Condition D of this SLC would only apply if

BASES (continued)

a non-functional sectionalizing valve(s) or isolation valve(s) rendered the entire main distribution piping non-functional.

The intent of TR 16.9-1-4 and TR 16.9-1-7 is to ensure the sectionalizing valve (main header valve used to isolate sections of the header) or isolation valve (branch line valve used to isolate specific fire suppression features (sprinkler/spray system, hose standpipe, or fire hydrant)) is operating properly and can be used to achieve isolation when called upon. If a sectionalizing or isolation valve cannot be cycled but is in the correct position ensuring a FUNCTIONAL flow path (fully open) as required by COMMITMENT b., then the associated feature (sprinkler/spray system, hose standpipe, or fire hydrant) can be considered FUNCTIONAL. If a sectionalizing or isolation valve cannot be cycled and is in the incorrect

position, or its position cannot be determined, thereby not ensuring a FUNCTIONAL flow path (not fully open) as required by COMMITMENT b., then the affected fire suppression feature (sprinkler system, hose standpipe, or fire hydrant) must be evaluated and the applicable SLCs entered (16.9-2, 16.9-4, and 16.9-23). If a sectionalizing valve in a loop header (i.e., flow path from two directions) cannot be cycled and it cannot be verified as fully open, then administrative controls may need to be implemented to ensure the available flow path is not isolated.

The ability to demonstrate that the valves in the RF/RY flow path can be cycled is critical to maintaining the system properly. The containment isolation valves (RF389B and RF447B) and the annulus sprinkler system isolation valve (RF457B) are required to be cycled or stroked in accordance with the Catawba Inservice Testing Program. Therefore, credit can be taken for cycling these valves under the IWV program, and they do not need to be cycled annually to meet the SLC criteria.

The proper positioning of RF/RY valves is critical to delivering fire suppression water at the fire source as quickly as possible. The option of increasing or decreasing the frequency of valve position verification allows the ability to optimize plant operational resources. Should an adverse trend develop with RF/RY valve positions, the frequency of verification shall be increased. Similarly, if the RF/RY valve position trends are positive, the frequency of verification could be decreased. Through programmed trending of RF/RY as found valve positions, the RF/RY System will be maintained at predetermined reliability standards. The Fire Protection Engineer is responsible for trending and determining verification frequencies based on the following:

BASES (continued)

Initially the frequency shall be monthly.

Annually review the results of the completed valve position verification procedures.

- If the results demonstrate that the valves are found in the correct position at least 99% of the time, the frequency of conducting the valve position verification may be decreased from monthly to quarterly or quarterly to semiannually or semiannually to annually as applicable. The frequency shall not be extended beyond annually (plus grace period).
- If the results demonstrate that the valves are not found in the correct position at least 99% of the time, the frequency of conducting the valve position verification shall be increased from annually to semiannually or semiannually to quarterly or quarterly to monthly as applicable. The valve position verification need not be conducted more often than monthly.

The term STAGGERED TEST BASIS is from the Catawba Standard Technical Specifications and is defined in the Catawba Surveillance Frequency Control Program (SFCP). The intent of the STAGGERED TEST BASIS for the total population of fire suppression pumps (n = 3) is to ensure at least one pump is tested (start and operate for ≥ 15 minutes) once every 21 days. The 21 days is derived from taking the overall targeted frequency (2 months, which equals 63 days in the PM program) divided by the number of components in the population (n = 3). With all three fire suppression pumps available, a different pump shall be tested every 21 days. In the event one of the fire suppression pumps is unavailable, then the two remaining available pumps shall be tested on alternate 21 days. With only one pump available, the remaining pump would be required to be tested every 21 days.

In the event that portions of the Fire Suppression Systems are non-functional, alternate backup fire fighting equipment is required to be made available in the affected areas until the non-functional equipment is restored to service. When the non-functional fire fighting equipment is intended for use as a backup means of fire suppression, a longer period of time is allowed to provide an alternate means of fire fighting than if the non-functional equipment is the primary means of fire suppression.

In the event the Fire Suppression Water System becomes non-functional, immediate corrective measures must be taken since this system provides the major fire suppression capability of the plant.

Since the requirement for fire suppression pump automatic starting functions is intended to provide a high level of system standby readiness,

BASES (continued)

loss of a primary pressure switch renders its associated main fire pump non-functional. If the primary pressure switch for one of the required pumps is non-functional, its associated pump is non-functional

This SLC is part of the Catawba Fire Protection Program and therefore subject to the provisions of the Catawba Renewed Facility Operating License Conditions 2.C.(5).

REFERENCES

1. Catawba UFSAR, Section 9.5.1.
2. Catawba Nuclear Station 10 CFR 50.48(c) Fire Protection Safety Evaluation (SE).
3. Catawba Plant Design Basis Specification for Fire Protection, CNS-1465.00-00-0006, as revised.
4. Catawba UFSAR, Section 18.2.8.
5. Catawba License Renewal Commitments, CNS-1274.00-00-0016, Section 4.12.1.
6. Catawba Renewed Facility Operating License Conditions 2.C.(5).
7. CN-SFL, Surveillance Frequency List

16.9 AUXILIARY SYSTEMS

16.9-5 Fire Rated Assemblies

COMMITMENT All required Fire Rated Assemblies (walls, floors/ceilings, cable enclosures and other fire barriers) and all sealing devices in fire rated assembly penetrations (fire doors, fire dampers, and penetration seals) as shown on the CN-1105 drawing series shall be FUNCTIONAL.

APPLICABILITY: At all times.

---NOTE---
Non-functional or breached fire barrier features (walls, floors, ceilings, doors, dampers, and penetration seals) in the diesel generator rooms and the auxiliary feedwater pump rooms may affect CO_2 System FUNCTIONALITY. See SLC 16.9-3, "CO_2 Systems".

REMEDIAL ACTIONS

IF the required Fire Rated Assembly sealing device is a Fire Door, see Table 16.9-5-1

IF the required Fire Rated Assembly sealing device is a Fire Damper see Table 16.9-5-2

IF required Fire Rated Assembly is a Fire Barrier or Penetration Seal:

1. Identify the location of the impaired fire protection feature by elevation, column, and building
2. Verify the wall, floor/ceiling is a committed boundary on the CN-1105 drawing series (if not a committed boundary, SLC 16.9-5 does not apply)
3. Refer to CN-1209-10 series drawings to identify the Fire Area on <u>both</u> sides of the impaired feature
4. IF either of the Fire Areas is identified as High Safety Significant (HSS) (see Table 16.9-5-3) then implement the REQUIRED ACTION **CONDITION A**
5. IF the Fire Areas are not HSS, then identify the associated shutdown trains/methods of the Fire Areas on each side of the barrier using Table 16.9-5-4 and implement the REQUIRED ACTION as identified in the following Chart:

Shutdown Train (Side 1 & Side 2)	*A*	*B*	*SSS*	*A or B*	*A and B*
A	**CONDITION C**	**CONDITION B**	**CONDITION B**	**CONDITION C**	**CONDITION B**
B	**CONDITION B**	**CONDITION C**	**CONDITION B**	**CONDITION C**	**CONDITION B**
SSS	**CONDITION B**	**CONDITION B**	**CONDITION C**	**CONDITION B**	**CONDITION B**
A or B	**CONDITION C**	**CONDITION C**	**CONDITION B**	**CONDITION C**	**CONDITION B**
A and B	**CONDITION B**	**CONDITION B**	**CONDITION B**	**CONDITION B**	**CONDITION C**

REMEDIAL ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more HSS* required Fire Rated Assemblies is non-functional.	A.1 Establish a continuous fire watch on at least one side of the assembly.	1 hour
	<u>OR</u>	
	A.2.1 Verify at least one side of the assembly has FUNCTIONAL fire detection instrumentation.	1 hour
	<u>AND</u>	
	A.2.2 Establish an hourly fire watch patrol on at least one side of the assembly.	1 hour
	<u>OR</u>	
	A.3 Complete an evaluation as permitted by NRC RIS 2005-07 to institute required action(s).	Prior to terminating Required Action A.1 or A.2

(continued)

REMEDIAL ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more LSS** required Fire Rated Assemblies is non-functional.	B.1 Establish an hourly fire watch on at least one side of the assembly.	1 hour
	OR	
	B.2.1 Verify at least one side of the assembly has FUNCTIONAL fire detection instrumentation.	1 hour
	AND	
	B.2.2 Establish a once per shift fire watch patrol on at least one side of the assembly.	1 hour
	OR	
	B.3 Complete an evaluation as permitted by NRC RIS 2005-07 to institute required action(s).	Prior to terminating Required Action B.1 or B.2

(continued)

REMEDIAL ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more DID*** required Fire Rated Assemblies is non-functional.	C.1 Establish a once per shift fire watch on at least one side of the assembly.	1 hour
	OR	
	C.2 Verify at least one side of the assembly has FUNCTIONAL fire detection instrumentation.	1 hour
	OR	
	C.3 Complete an evaluation as permitted by NRC RIS 2005-07 to institute required action(s).	Prior to terminating Required Action C.1

*High Safety Significant (HSS) Fire Areas containing required Fire Rated Assemblies are defined in Table 16.9-5-3.

**Low Safety Significant (LSS) Fire Areas containing required Fire Rated Assemblies are defined as those areas with a boundary between redundant shutdown trains.

***Defense-in-Depth (DID) Fire Areas containing required Fire Rated Assemblies are defined as analysis compartment boundaries or PRA compartment boundaries that do not meet the HSS or LSS definitions.

TESTING REQUIREMENTS

TEST		FREQUENCY
TR 16.9-5-1	Verify each HSS and LSS interior unlocked fire door is closed.	24 hours
TR 16.9-5-2	Verify each HSS and LSS locked closed fire door is closed.	7 days
TR 16.9-5-3	Perform an inspection and functional test of the release and closing mechanism and latches for each swinging fire door shown in Table 16.9-5-1.	6 months
TR 16.9-5-4	Perform a visual inspection of the exposed surfaces of each required Fire Rated Assembly.	18 months
TR 16.9-5-5	------------------------------NOTE------------------------------ Any abnormal changes or degradation shall be identified and resolved via the corrective action program. Based on the investigation results, additional dampers may be selected for inspection. Samples will be grouped by unit, system, and train and shall be selected such that each damper is inspected every 15 years. --- Perform a visual inspection of fire dampers in each required Fire Rated Assembly, shown in Table 16.9-5-2.	18 months, in accordance with the predefined inspection schedule

(continued)

TESTING REQUIREMENTS (continued)

TEST		FREQUENCY
TR 16.9-5-6	------------------------------NOTE------------------------------ Any abnormal changes or degradation shall be identified and resolved via the corrective action program. Based on the investigation results, additional Fire Rated Assemblies may be selected for inspection. Samples shall be selected such that each Fire Rated Assembly is inspected every 15 years. -- Perform a visual inspection of penetration seals in each HSS AND LSS required Fire Rated Assembly.	18 months, in accordance with the predefined inspection schedule
TR 16.9-5-7	Perform an inspection and functional test of the automatic hold open, release and closing mechanism for each rolling fire door shown in Table 16.9-5-1.	18 Months

Table 16.9-5-1

Required Fire Doors

DOOR NUMBER	BLDG	LOCATION	ELEVATION	FIRE AREA INTERFACE	RISK CRITERIA	REMEDIAL ACTION CONDITION
AX500F	AUX	56, FF	522+0	1/4	DID	C
AX214A	AUX	54-55, FF-GG	543+0	1/4	DID	C
AX214B	AUX	58-59, FF-GG	543+0	1/4	DID	C
AX217D	AUX	52-53, BB	543+0	3/34	LSS	B
AX217F(1)	AUX	51, AA-BB	543+0	3/40	LSS	B
AX217G	AUX	52-53, BB	543+0	3/32	LSS	B
AX227D	AUX	54-55, MM-NN	543+0	4/22	DID	C
AX227E	AUX	59-60, MM-NN	543+0	4/22	DID	C
AX228A	AUX	56-57, EE	543+0	4/9	DID	C
AX228B	AUX	57-58, EE	543+0	4/10	DID	C
AX248	AUX	57-58, QQ	543+0	4/ASB	LSS	B
AX260B	AUX	61-62, BB-CC	543+0	2/36	LSS	B
AX260F(1)	AUX	62, AA-BB	543+0	2/39	LSS	B
AX260G	AUX	61-62, BB-CC	543+0	2/31	LSS	B
AX260H	AUX	61-62, BB-CC	543+0	2/33	LSS	B
T527#1	AUX	52-53, BB-CC	543+0	3/37	LSS	B
AX202	AUX	51, NN	543+0	4/STAIR	DID	C
AX253A	AUX	63, NN	543+0	4/STAIR	DID	C
AX227A	AUX	59, FF-GG	543+0	4/STAIR	DID	C
AX260E	AUX	52, CC	543+0	3/STAIR	DID	C
AX516M	AUX	62, CC	543+0	2/STAIR	DID	C
AX354A	AUX	55, DD-EE	554+0	22/45	LSS	B
AX354B	AUX	59, DD-EE	554+0	22/46	LSS	B
AX418	AUX	57, BB	554+0	9/10	DID	C
AX419	AUX	57, DD-EE	554+0	9/10	DID	C
AX420A	AUX	59, DD-EE	554+0	9/46	LSS	B
AX421A	AUX	55, DD-EE	554+0	10/45	LSS	B
S102A	AUX	53-54, AA	554+0	10/SRV	LSS	B
AX302	AUX	41, CC-DD	556+0	25/41	DID	C
AX304	AUX	41, AA-BB	556+0	26/42	DID	C
AX306	AUX	73, DD-EE	556+0	27/43	DID	C
AX308	AUX	73, BB-CC	556+0	28/44	DID	C
AX348B	AUX	54-55, MM-NN	560+0	11/22	DID	C
AX348C	AUX	53-54, HH	560+0	4/11	DID	C
AX348D	AUX	59-60, MM-NN	560+0	11/22	DID	C
AX348E	AUX	60-61, HH	560+0	4/11	DID	C
AX352B	AUX	53, CC-DD	560+0	6/STAIR	HSS	A
AX352C	AUX	53, CC-DD	560+0	10/STAIR	DID	C
AX352D	AUX	46-47, BB-CC	560+0	6/RB1	HSS	A
AX353	AUX	45, BB	560+0	6/8	HSS	A
AX353B	AUX	45, AA-BB	560+0	8/41	LSS	B
AX353C	AUX	45, AA-BB	560+0	8/42	DID	C

(continued)

Table 16.9-5-1

Required Fire Doors

DOOR NUMBER	BLDG	LOCATION	ELEVATION	FIRE AREA INTERFACE	RISK CRITERIA	REMEDIAL ACTION CONDITION
AX393B	AUX	61, CC-DD	560+0	9/STAIR	DID	C
AX393C	AUX	61, CC-DD	560+0	5/STAIR	DID	C
AX393D	AUX	67-68, BB-CC	560+0	5/RB2	LSS	B
AX394	AUX	69, BB	560+0	5/7	DID	C
AX394B	AUX	69, AA-BB	560+0	7/43	LSS	B
AX394C	AUX	69, AA-BB	560+0	7/44	DID	C
AX395	AUX	61, AA-BB	560+0	7/9	LSS	B
AX396	AUX	53, AA-BB	560+0	8/10	LSS	B
AX415	AUX	45-46, CC-DD	560+0	6/RB1	HSS	A
AX416	AUX	68-69, CC-DD	560+0	5/RB2	LSS	B
AX417	AUX	57, QQ	560+0	11/ASB	LSS	B
AX313D	AUX	51, NN	560+0	11/STAIR	DID	C
AX388B	AUX	63, NN	560+0	11/STAIR	DID	C
AX348	AUX	59, FF-GG	560+0	11/STAIR	DID	C
AX355A	AUX	53-54, FF	568+0	4/11	DID	C
AX355D	AUX	60, FF	568+0	4/11	DID	C
AX355E	AUX	60, FF	568+0	11/STAIR	DID	C
AX515	AUX	54, BB	574+0	17/45	HSS	A
AX516	AUX	56-57, DD	574+0	14/45	HSS	A
AX516A	AUX	57-58, DD	574+0	16/46	HSS	A
AX516K	AUX	57, AA-BB	574+0	16/17	HSS	A
AX517A	AUX	53-54, DD-EE	574+0	22/45	LSS	B
AX517B	AUX	60-61, DD-EE	574+0	22/46	LSS	B
AX517C	AUX	57, DD-EE	574+0	45/46	DID	C
AX517D	AUX	57, DD-EE	574+0	9/46	LSS	B
AX517E	AUX	56-57, DD-EE	574+0	10/46	LSS	B
AX518	AUX	60, BB	574+0	16/46	HSS	A
S303	SRV	36-37, 1N	574+0	45/SRV	DID	C
S303C	SRV	36-37, V	574+0	45/SRV	DID	C
S304A	AUX	60, AA	574+0	46/SRV	DID	C
AX500H	AUX	54-55, MM-NN	577+0	18/22	DID	C
AX500K	AUX	53-54, HH-GG	577+0	4/18	DID	C
AX500L	AUX	59-60, MM-NN	577+0	18/22	DID	C
AX500N	AUX	60-61, HH-GG	577+0	4/18	DID	C
AX513B	AUX	53, CC-DD	577+0	13/STAIR	HSS	A
AX514	AUX	45, BB	577+0	13/15	HSS	A
AX514B	AUX	45-46, AA-BB	577+0	6/13	HSS	A
AX517	AUX	57, EE	577+0	9/18	DID	C
AX525	AUX	55-56, QQ	577+0	18/ASB	LSS	B
AX525B	AUX	56, QQ	577+0	18/ASB	LSS	B
AX526D	AUX	58, QQ	577+0	18/ASB	LSS	B
A314#3	AUX	61, CC-DD	577+0	12/STAIR	HSS	A
AX533C	AUX	61, CC-DD	577+0	46/STAIR	DID	C
AX534	AUX	69, BB	577+0	12/14	HSS	A

(continued)

Table 16.9-5-1

Required Fire Doors

DOOR NUMBER	BLDG	LOCATION	ELEVATION	FIRE AREA INTERFACE	RISK CRITERIA	REMEDIAL ACTION CONDITION
AX534B	AUX	68-69, AA-BB	577+0	7/14	HSS	A
AX535A	AUX	61, AA-BB	577+0	14/46	HSS	A
AX536	AUX	53, AA-BB	577+0	15/45	HSS	A
AX656	AUX	53, CC-DD	577+0	45/STAIR	DID	C
AX500P	AUX	51, NN	577+0	18/STAIR	DID	C
AX500S	AUX	63, NN	577+0	18/STAIR	DID	C
AX338A	AUX	60, FF-GG	577+0	18/STAIR	DID	C
AX602	AUX	52, UU-VV	594+0	24/ASB	DID	C
AX627	AUX	62, UU-VV	594+0	23/ASB	DID	C
AX630	AUX	58, QQ	594+0	22/ASB	LSS	B
AX632	AUX	57, QQ	594+0	22/ASB	LSS	B
AX635	AUX	60-61, QQ	594+0	22/ASB	LSS	B
AX635E	AUX	53-54, QQ	594+0	22/ASB	LSS	B
AX635F	AUX	53-54, QQ	594+0	22/ASB	LSS	B
AX655	AUX	62-63, DD	594+0	19/48	LSS	B
AX656C	AUX	61, CC-DD	594+0	19/22	LSS	B
AX657	AUX	60-61, CC	594+0	19/22	LSS	B
AX657A(2)	AUX	54, BB	594+0	21/35	HSS	A
AX657B	AUX	52-53, CC-DD	594+0	20/22	LSS	B
AX657E(2)	AUX	53, BB	594+0	21/35	HSS	A
AX657F	AUX	60, DD-EE	594+0	21/22	HSS	A
AX657G	AUX	57-58, DD-EE	594+0	21/22	HSS	A
AX657H	AUX	54, DD-EE	594+0	21/22	HSS	A
AX657J	AUX	53, BB-CC	594+0	20/21	HSS	A
AX658B	AUX	51-52, DD	594+0	20/49	LSS	B
S400	AUX	55-56, AA	594+0	21/SRV	HSS	A
S406	AUX	58-59, AA	594+0	21/SRV	HSS	A
AX635G	AUX	51, NN	594+0	22/STAIR	DID	C
AX635H	AUX	63, NN	594+0	22/STAIR	DID	C
AX654A	AUX	60, FF	594+0	22/STAIR	DID	C
AX654B	AUX	61, CC-DD	594+0	19/STAIR	DID	C
AX665B	AUX	53, CC-DD	594+0	22/STAIR	DID	C
AX700B	AUX	50-51, JJ-KK	605+10	24/RB1	LSS	B
AX700D	AUX	63-64, KK	605+10	22/23	LSS	B
AX701	AUX	50-51, JJ-KK	605+10	22/RB1	LSS	B
AX714B	AUX	63-64, JJ-KK	605+10	23/RB2	LSS	B
AX720	AUX	50-51, HH-JJ	605+10	22/RB1	LSS	B
AX721	AUX	63-64, HH-JJ	605+10	22/RB2	LSS	B
AX714C	AUX	50-51, KK	605+10	22/24	LSS	B
AX715A	AUX	63-64, JJ-KK	605+10	22/RB2	LSS	B
S211(2)	TB1	17, V	568+0	SRV/TB1	DID	C
S212	TB1	19, V	568+0	SRV/TB1	DID	C
S210	TB1	21,V	568+0	SRV/TB1	DID	C

(continued)

Table 16.9-5-1

Required Fire Doors

DOOR NUMBER	BLDG	LOCATION	ELEVATION	FIRE AREA INTERFACE	RISK CRITERIA	REMEDIAL ACTION CONDITION
S206	TB1	22, V	568+0	SRV/TB1	DID	C
S201	TB1	33, V	568+0	SRV/TB1	DID	C
SR3(3)	TB1	30-31, V	568+0	SRV/TB1	DID	C
S201A	TB1	27, V	568+0	SRV/TB1	DID	C
T101	TB1	31, 1K	568+0	TB1/U1 OTT	DID	C
S424	TB1	24-25, V	594+0	SRV/TB1	DID	C
S425	TB1	23, V	594+0	SRV/TB1	DID	C
S426	TB1	22, V	594+0	SRV/TB1	DID	C
SR21(3)	TB1	24, V	594+0	SRV/TB1	DID	C
S472	TB1	27, V	594+0	SRV/TB1	DID	C
S423	TB1	29, V	594+0	SRV/TB1	DID	C
S422	TB1	29, V	594+0	SRV/TB1	DID	C
SR7(3)	TB1	29-30, V	594+0	SRV/TB1	DID	C
S416	TB1	32, V	594+0	SRV/TB1	DID	C
S444	TB1	15, V	594+0	SRV/TB1	DID	C
TR4(3)	TB1	15-16, V	594+0	SRV/TB1	DID	C
T200A	TB1	32, 1J-1K	594+0	TB1/U1 MTOT	DID	C
S701	TB1	22, 1L	619+6	SRV/TB1	DID	C
S704	TB1	33, 1L	619+6	SRV/TB1	DID	C
S209	TB2	20, P	568+0	SRV/TB2	DID	C
S208	TB2	22, P	568+0	SRV/TB2	DID	C
SR2(3)	TB2	32-33, P	568+0	SRV/TB2	DID	C
S462	TB2	32, P	568+0	SRV/TB2	DID	C
SR4(3)	TB2	30-31, P	568+0	SRV/TB2	DID	C
S1102	TB2	27, P	568+0	SRV/TB2	DID	C
T151	TB2	31, 2K	568+0	TB2/U2 OTT	DID	C
S423E	TB2	26, P-Q	594+0	SRV/TB2	DID	C
S416A	TB2	32, P	594+0	SRV/TB2	DID	C
SR8(3)	TB2	29-30, P	594+0	SRV/TB2	DID	C
S422A	TB2	29, P	594+0	SRV/TB2	DID	C
S423A	TB2	29, P	594+0	SRV/TB2	DID	C
S435	TB2	24-25, P	594+0	SRV/TB2	DID	C
S436	TB2	23, P	594+0	SRV/TB2	DID	C
S437	TB2	22, P	594+0	SRV/TB2	DID	C
SR22(3)	TB2	24, P	594+0	SRV/TB2	DID	C
S444A	TB2	15, P	594+0	SRV/TB2	DID	C
SR16(3)	TB2	15-16, P	594+0	SRV/TB2	DID	C
S472A	TB2	27, P	594+0	SRV/TB2	DID	C
T250A	TB2	32, 2J-2K	594+0	TB2/U2 MTOT	DID	C
S701A	TB2	22, 2L	619+6	SRV/TB2	DID	C
S704A	TB2	33, 2L	619+6	SRV/TB2	DID	C
AX662A	NSWPS	----	600+0	29/30	LSS	B

(1) These doors are not equipped with closing mechanisms or latches and are therefore exempt from TESTING REQUIREMENT 16.9-5-3.
(2) These doors are held open with a fusible link.
(3) Rolling Door.

Table 16.9-5-2

Required Fire Dampers

DAMPER NUMBER	BLDG	LOCATION	ELEVATION	FIRE AREA INTERFACE	RISK CRITERIA	REMEDIAL ACTION CONDITION
1VA-FD001	AUX	53/GG-FF	522+0	1/4	DID	C
1VA-FD002	AUX	53/GG-HH	522+0	1/4	DID	C
1VA-FD003	AUX	55-56/GG-HH	522+0	1/4	DID	C
1VA-FD004	AUX	55-56/GG-HH	522+0	1/4	DID	C
1VA-FD005	AUX	54-55/GG-HH	522+0	1/4	DID	C
1VA-FD006	AUX	54-55/GG-HH	522+0	1/4	DID	C
1VA-FD007	AUX	53/GG-FF	522+0	1/4	DID	C
1VA-FD008	AUX	53/GG-FF	522+0	1/4	DID	C
1VA-FD009	AUX	53-54/FF-GG	522+0	1/1 (ND PUMPS)	DID	C
1VA-FD010	AUX	56-57/ GG-HH,	522+0	1/4	DID	C
1VA-FD011	AUX	56-57/FF	522+0	1/4	DID	C
1VA-FD012	AUX	51/NN-PP	543+0	11/STAIR	DID	C
1VA-FD013	AUX	54/MM	543+0	4/22	DID	C
1VA-FD014	AUX	54/MM	543+0	4/22	DID	C
1VA-FD015	AUX	54-55/MM-NN	543+0	4/22	DID	C
1VA-FD016	AUX	54-55/MM-NN	543+0	4/22	DID	C
1VA-FD017	AUX	54-55/MM-NN	543+0	4/22	DID	C
1VA-FD020	AUX	55/JJ-KK	543+0	4/4 (NV PUMPS)	DID	C
1VA-FD033	AUX	51-52/AA-BB	543+0	3/40	LSS	B
1VA-FD034	AUX	51-52/AA-BB	543+0	3/40	LSS	B
1VA-FD035	AUX	52/AA-BB	543+0	3/32	LSS	B
1VA-FD036	AUX	52-53/BB	543+0	3/32	LSS	B
1VA-FD038	AUX	52-53/BB	543+0	3/34	LSS	B
1VA-FD039	AUX	52-53/BB	543+0	3/34	LSS	B
1VA-FD040	AUX	52-53/BB	543+0	3/32	LSS	B
1VA-FD041	AUX	52-53/BB	543+0	3/32	LSS	B
1VA-FD042	AUX	53/CC	543+0	3/STAIR	DID	C
1VA-FD043	AUX	53/CC-DD	543+0	3/STAIR	DID	C
1VA-FD045	AUX	52-53/DD	560+0	3/6	HSS	A
1VA-FD046	AUX	52-53/CC-DD	577+0	6/13	HSS	A
1VA-FD047	AUX	52-53/CC-DD	577+0	6/13	HSS	A
1VA-FD048	AUX	54/MM-NN	560+0	11/22	DID	C
1VA-FD049	AUX	54/MM	560+0	11/22	DID	C
1VA-FD050	AUX	54-55/MM	560+0	4/22	DID	C
1VA-FD051	AUX	54-55/MM	560+0	4/22	DID	C
1VA-FD052	AUX	55/MM-NN	560+0	11/22	DID	C
1VA-FD053	AUX	55/MM	560+0	11/22	DID	C
1VA-FD054	AUX	53/GG-HH	560+0	4/11	DID	C
1VA-FD055	AUX	53/GG-HH	560+0	4/11	DID	C
1VA-FD056	AUX	53/KK	560+0	4/11	DID	C
1VA-FD057	AUX	53/GG-HH	560+0	4/11	DID	C

(continued)

Table 16.9-5-2

REQUIRED FIRE DAMPERS

DAMPER NUMBER	BLDG	LOCATION	ELEVATION	FIRE AREA INTERFACE	RISK CRITERIA	REMEDIAL ACTION CONDITION
1VA-FD058	AUX	53-54/HH	560+0	4/11	DID	C
1VA-FD059	AUX	54/GG-HH	560+0	4/11	DID	C
1VA-FD060	AUX	54/HH	560+0	4/11	DID	C
1VA-FD061	AUX	56-57/QQ	577+0	18/ASB	LSS	B
1VA-FD062	AUX	55-56/QQ	577+0	18/ASB	LSS	B
1VA-FD063	AUX	55/MM-NN	577+0	18/22	DID	C
1VA-FD064	AUX	55/MM	577+0	18/22	DID	C
1VA-FD065	AUX	54/MM	577+0	18/22	DID	C
1VA-FD066	AUX	54/MM	577+0	18/22	DID	C
1VA-FD067	AUX	54/HH	577+0	4/18	DID	C
1VA-FD068	AUX	53-54/HH	577+0	4/18	DID	C
1VA-FD069	AUX	54/GG-HH	577+0	4/18	DID	C
1VA-FD070	AUX	53-54/HH	577+0	4/18	DID	C
1VA-FD071	AUX	53-54/HH	577+0	4/18	DID	C
1VA-FD072	AUX	53/HH	577+0	4/18	DID	C
1VA-FD073	AUX	53/HH	577+0	4/18	DID	C
1VA-FD074	AUX	53/GG-HH	577+0	4/18	DID	C
1VA-FD075	AUX	53-54/KK-LL	594+0	18/22	DID	C
1VA-FD076	AUX	53-54/KK-LL	594+0	18/22	DID	C
1VA-FD078	AUX	57/NN	594+0	22/STAIR	DID	C
1VA-FD087	AUX	55-56/QQ	594+0	22/ASB	LSS	B
1VA-FD088	AUX	53-54/QQ	594+0	22/ASB	LSS	B
1VA-FD133	AUX	53/CC-DD	594+0	22/STAIR	DID	C
1VA-FD139	AUX	51-52/DD	543+0	3/4	DID	C
1VA-FD140	AUX	53-54/FF-GG	560+0	4/11	DID	C
1VA-FD141	AUX	53-54/FF-GG	560+0	4/11	DID	C
1VA-FD142	AUX	53/GG	560+0	4/11	DID	C
1VA-FD143	AUX	53/JJ-HH	560+0	4/11	DID	C
1VA-FD144	AUX	53/KK	560+0	4/11	DID	C
1VA-FD145	AUX	51/KK	560+0	11/18	DID	C
1VA-FD146	AUX	51/KK	560+0	11/18	DID	C
1VA-FD147	AUX	52/MM	560+0	11/18	DID	C
1VA-FD148	AUX	52/MM-NN	560+0	4/11	DID	C
1VA-FD149	AUX	52-53/DD	560+0	3/6	HSS	A
1VA-FD150	AUX	52-53/DD	560+0	3/6	HSS	A
1VA-FD152	AUX	52-53/BB-CC	543+0	3/37	LSS	B
1VA-FD153	AUX	52-53/CC	543+0	3/37	LSS	B
1VA-FD154	AUX	53-54/GG-HH	594+0	4/22	DID	C
1VA-FD155	AUX	53-54/GG-HH	594+0	4/22	DID	C
1VA-FD159	AUX	49-50/AA-BB	543+0	CO2	HSS	A
1VA-FD160	AUX	50-51/AA-BB	543+0	CO2	HSS	A
1VA-FD163	AUX	56/EE	543+0	10/45	LSS	B
1VA-FD164	AUX	56-57/EE	543+0	4/10	DID	C
2VA-FD001	AUX	61/GG-FF	522+0	1/4	DID	C
2VA-FD002	AUX	61/GG-FF	522+0	1/4	DID	C

(continued)

Table 16.9-5-2

REQUIRED FIRE DAMPERS

DAMPER NUMBER	BLDG	LOCATION	ELEVATION	FIRE AREA INTERFACE	RISK CRITERIA	REMEDIAL ACTION CONDITION
2VA-FD003	AUX	60-61/FF-GG	522+0	1/1 (ND PUMPS)	DID	C
2VA-FD004	AUX	61/GG-FF	522+0	1/4	DID	C
2VA-FD005	AUX	60-61/GG-HH	522+0	1/4	DID	C
2VA-FD006	AUX	59-60/GG-HH	522+0	1/4	DID	C
2VA-FD007	AUX	59-60/GG-HH	522+0	1/4	DID	C
2VA-FD008	AUX	58-59/GG-HH	522+0	1/4	DID	C
2VA-FD009	AUX	58-59/GG-HH	522+0	1/4	DID	C
2VA-FD010	AUX	57-58/GG-HH	522+0	1/4	DID	C
2VA-FD011	AUX	57-58/FF	522+0	1/4	DID	C
2VA-FD012	AUX	59-60/MM-NN	543+0	4/22	DID	C
2VA-FD013	AUX	59/MM	543+0	4/22	DID	C
2VA-FD014	AUX	59/MM	543+0	4/22	DID	C
2VA-FD015	AUX	59-60/MM-NN	543+0	4/22	DID	C
2VA-FD020	AUX	63/NN	534+0	4/STAIR	DID	C
2VA-FD023	AUX	59/JJ-KK	543+0	4/4 (NV PUMPS)	DID	C
2VA-FD036	AUX	61-62/DD	560+0	2/5	LSS	B
2VA-FD037	AUX	61-62/CC-DD	577+0	5/12	HSS	A
2VA-FD038	AUX	61-62/CC-DD	577+0	5/12	HSS	A
2VA-FD040	AUX	62-63/AA-BB	543+0	2/39	LSS	B
2VA-FD041	AUX	62-63/AA-BB	543+0	2/39	LSS	B
2VA-FD042	AUX	62/AA-BB	543+0	2/31	LSS	B
2VA-FD043	AUX	61-62/BB	543+0	2/31	LSS	B
2VA-FD045	AUX	61/CC	543+0	2/STAIR	DID	C
2VA-FD046	AUX	61/CC-DD	543+0	2/STAIR	DID	C
2VA-FD048	AUX	61-62/BB	543+0	2/33	LSS	B
2VA-FD049	AUX	61-62/BB	543+0	2/33	LSS	B
2VA-FD050	AUX	61-62/BB	543+0	2/31	LSS	B
2VA-FD051	AUX	61-62/BB	543+0	2/31	LSS	B
2VA-FD053	AUX	60/MM	560+0	11/22	DID	C
2VA-FD054	AUX	59/MM-NN	560+0	11/22	DID	C
2VA-FD056	AUX	60/MM-NN	560+0	11/22	DID	C
2VA-FD057	AUX	59-60/MM	560+0	11/22	DID	C
2VA-FD058	AUX	59-60/MM	560+0	4/22	DID	C
2VA-FD059	AUX	60-61/HH	560+0	4/11	DID	C
2VA-FD060	AUX	61/HH-JJ	560+0	4/11	DID	C
2VA-FD061	AUX	60-61/GG-HH	560+0	4/11	DID	C
2VA-FD062	AUX	61/GG-HH	560+0	4/11	DID	C
2VA-FD063	AUX	61/GG-HH	560+0	4/11	DID	C
2VA-FD064	AUX	60-61/GG-HH	560+0	4/11	DID	C
2VA-FD065	AUX	61/HH	560+0	4/11	DID	C
2VA-FD069	AUX	58-59/QQ	577+0	18/ASB	LSS	B
2VA-FD070*	AUX	59-60/QQ	577+0	18/ASB	LSS	B
2VA-FD071	AUX	59-60/MM-NN	577+0	18/22	DID	C
2VA-FD072	AUX	59-60/MM	577+0	18/22	DID	C

(continued)

Table 16.9-5-2

REQUIRED FIRE DAMPERS

DAMPER NUMBER	BLDG	LOCATION	ELEVATION	FIRE AREA INTERFACE	RISK CRITERIA	REMEDIAL ACTION CONDITION
2VA-FD073	AUX	60/MM	577+0	18/22	DID	C
2VA-FD074	AUX	60/MM	577+0	18/22	DID	C
2VA-FD075	AUX	60/HH	577+0	4/22	DID	C
2VA-FD076	AUX	60/HH	577+0	4/22	DID	C
2VA-FD077	AUX	60-61/HH	577+0	4/22	DID	C
2VA-FD078	AUX	60-61/HH	577+0	4/22	DID	C
2VA-FD079	AUX	61/HH	577+0	4/22	DID	C
2VA-FD080	AUX	61/GG-HH	577+0	4/22	DID	C
2VA-FD081	AUX	61/HH	577+0	4/22	DID	C
2VA-FD083	AUX	63/NN	594+0	22/STAIR	DID	C
2VA-FD086	AUX	60/FF	594+0	22/STAIR	DID	C
2VA-FD087	AUX	59-60/QQ	594+0	22/ASB	LSS	B
2VA-FD088	AUX	60-61/QQ	594+0	22/ASB	LSS	B
2VA-FD093	AUX	58-59/QQ	594+0	22/ASB	LSS	B
2VA-FD097	AUX	61/CC-DD	594+0	22/STAIR	DID	C
2VA-FD108A	AUX	57-59/QQ	611+0	22/ASB	LSS	B
2VA-FD108B	AUX	57-59/QQ	611+0	22/ASB	LSS	B
2VA-FD114	AUX	59-60/KK-LL	594+0	18/22	DID	C
2VA-FD115	AUX	59-60/KK-LL	594+0	18/22	DID	C
2VA-FD137	AUX	60-61/FF-GG	560+0	4/18	DID	C
2VA-FD138	AUX	60-61/FF-GG	560+0	4/18	DID	C
2VA-FD139	AUX	61/GG	560+0	4/11	DID	C
2VA-FD141	AUX	62-63/DD	543+0	2/4	DID	C
2VA-FD142	AUX	60-61/KK	560+0	4/11	DID	C
2VA-FD143	AUX	62-63/KK	560+0	4/18	DID	C
2VA-FD144	AUX	63/KK	560+0	4/18	DID	C
2VA-FD145	AUX	61-62/MM-NN	560+0	4/11	DID	C
2VA-FD146	AUX	61-62/DD	560+0	2/5	LSS	B
2VA-FD147	AUX	61-62/DD	560+0	2/5	LSS	B
2VA-FD151	AUX	61-62/BB-CC	543+0	2/36	LSS	B
2VA-FD152	AUX	61-62/CC	543+0	2/36	LSS	B
2VA-FD153	AUX	60-61/GG-HH	594+0	4/22	DID	C
2VA-FD154	AUX	60-61/GG-HH	594+0	4/22	DID	C
2VA-FD157	AUX	63-64/AA-BB	543+0	CO2	HSS	A
2VA-FD158	AUX	64-65/AA-BB	543+0	CO2	HSS	A
2VA-FD160	AUX	57-58/QQ	543+0	4/ASB	LSS	B
2VA-FD161	AUX	57-58/QQ	543+0	4/ASB	LSS	B
2VA-FD163	AUX	58/EE	543+0	9/46	LSS	B
2VA-FD164	AUX	57-58/EE	543+0	4/9	DID	C
0BRS-FD001	AUX	54-55/DD-EE	554+0	10/22	DID	C
0BRS-FD010	AUX	57/DD-EE	554+0	9/10	DID	C
0BRS-FD019	AUX	59/DD-EE	554+0	9/22	DID	C
0BRX-FD001A	AUX	54-55/DD-EE	554+0	10/22	DID	C
0BRX-FD001B	AUX	54-55/DD-EE	554+0	10/22	DID	C

(continued)

Table 16.9-5-2

REQUIRED FIRE DAMPERS

DAMPER NUMBER	BLDG	LOCATION	ELEVATION	FIRE AREA INTERFACE	RISK CRITERIA	REMEDIAL ACTION CONDITION
0BRX-FD001C	AUX	54-55/DD-EE	554+0	10/22	DID	C
0BRX-FD001D	AUX	54-55/DD-EE	554+0	10/22	DID	C
0BRX-FD001E	AUX	54-55/DD-EE	554+0	10/22	DID	C
0BRX-FD001F	AUX	54-55/DD-EE	554+0	10/22	DID	C
0BRX-FD001G	AUX	54-55/DD-EE	554+0	10/22	DID	C
0BRX-FD001H	AUX	54-55/DD-EE	554+0	10/22	DID	C
0BRX-FD002	AUX	54-55/DD-EE	554+0	10/22	DID	C
0BRX-FD009	AUX	57/AA-BB	554+0	9/10	DID	C
0BRX-FD010	AUX	57/AA-BB	554+0	9/10	DID	C
0BRX-FD011	AUX	57/BB-CC	554+0	9/10	DID	C
0BRX-FD012	AUX	57/CC-DD	554+0	9/10	DID	C
0BRX-FD013	AUX	57/CC-DD	554+0	9/10	DID	C
0BRX-FD014	AUX	57/DD-EE	554+0	9/10	DID	C
0BRX-FD021	AUX	60/DD-EE	554+0	9/22	DID	C
0BRX-FD022A	AUX	60/DD-EE	554+0	9/22	DID	C
0BRX-FD022B	AUX	60/DD-EE	554+0	9/22	DID	C
0BRX-FD022C	AUX	60/DD-EE	554+0	9/22	DID	C
0BRX-FD022D	AUX	60/DD-EE	554+0	9/22	DID	C
0BRX-FD022E	AUX	60/DD-EE	554+0	9/22	DID	C
0BRX-FD022F	AUX	60/DD-EE	554+0	9/22	DID	C
0BRX-FD022G	AUX	60/DD-EE	554+0	9/22	DID	C
0BRX-FD022H	AUX	60/DD-EE	554+0	9/22	DID	C
0BRX-FD023	AUX	57/BB-CC	554+0	9/10	DID	C
1CRA-FD005A	AUX	54-55/DD-EE	594+0	21/22	HSS	A
1CRA-FD005B	AUX	54-55/DD-EE	594+0	21/22	HSS	A
1CRA-FD008	AUX	54/AA	594+0	21/35	HSS	A
1CRA-FD009	AUX	53-54/CC-DD	594+0	22/STAIR	DID	C
1CRA-FD010	AUX	53-54/CC	594+0	21/STAIR	HSS	A
1CRA-FD011	AUX	53/AA-BB	594+0	20/35	DID	C
1CRA-FD012	AUX	53/BB-CC	594+0	20/21	HSS	A

(continued)

Table 16.9-5-2

REQUIRED FIRE DAMPERS

DAMPER NUMBER	BLDG	LOCATION	ELEVATION	FIRE AREA INTERFACE	RISK CRITERIA	REMEDIAL ACTION CONDITION
1CRA-FD013	AUX	52/CC-DD	594+0	20/22	LSS	B
1CRA-FD016	AUX	54-55/DD-EE	574+0	22/45	LSS	B
1CRA-FD017	AUX	54-55/DD	574+0	17/45	HSS	A
1CRA-FD018	AUX	54-55/DD	574+0	17/45	HSS	A
1CRA-FD019	AUX	54/AA-BB	574+0	17/45	HSS	A
1CRA-FD020	AUX	57/CC-DD	574+0	16/17	HSS	A
1CRA-FD021	AUX	53-54/DD-EE	574+0	22/45	LSS	B
1CRA-FD022	AUX	55-56/DD	574+0	17/45	HSS	A
1CRA-FD023	AUX	56-57/DD	574+0	17/45	HSS	A
1CRA-FD024A	AUX	57/DD-EE	574+0	45/46	DID	C
1CRA-FD024B	AUX	57/DD-EE	574+0	45/46	DID	C
1CRA-FD025A	AUX	54-55/DD-EE	574+0	22/45	LSS	B
1CRA-FD025B	AUX	54-55/DD-EE	574+0	22/45	LSS	B
1CRA-FD026	AUX	54-55/EE	577+0	18/22	DID	C
1CRA-FD028	AUX	53-54/EE	577+0	18/22	DID	C
1CRA-FD029	AUX	54-55/EE	568+0	11/22	DID	C
1CRA-FD030	AUX	54-55/EE	568+0	11/22	DID	C
1CRA-FD039	AUX	57/EE-FF	577+0	18/18 (KC PUMPS)	DID	C
1CR-FD001	AUX	55-56/DD-EE	594+0	21/22	HSS	A
1CR-FD002	AUX	55-56/DD-EE	594+0	21/22	HSS	A
1CR-FD003	AUX	54/AA-BB	594+0	21/35	HSS	A
1CR-FD004	AUX	53-54/BB	594+0	21/35	HSS	A
1CR-FD005	AUX	53-54/BB	594+0	21/35	HSS	A
1CR-FD007	AUX	51/CC-DD	594+0	13/20	HSS	A
2CRA-FD005A	AUX	59-60/DD-EE	594+0	21/22	HSS	A
2CRA-FD005B	AUX	59-60/DD-EE	594+0	21/22	HSS	A
2CRA-FD008	AUX	60/AA-BB	594+0	19/21	HSS	A
2CRA-FD009	AUX	60-61/CC	594+0	19/22	LSS	B
2CRA-FD012	AUX	61/CC-DD	594+0	19/22	LSS	B
2CRA-FD015	AUX	59-60/DD-EE	574+0	22/46	LSS	B
2CRA-FD016	AUX	59-60/DD	574+0	16/46	HSS	A
2CRA-FD017	AUX	59-60/DD	574+0	16/46	HSS	A
2CRA-FD018	AUX	60/AA-BB	574+0	16/46	HSS	A
2CRA-FD019	AUX	58-59/DD	574+0	16/46	HSS	A
2CRA-FD020	AUX	57-58/DD	574+0	16/46	HSS	A
2CRA-FD021	AUX	60-61/DD-EE	574+0	22/46	LSS	B
2CRA-FD022A	AUX	59-60/DD-EE	574+0	22/46	LSS	B

(continued)

Table 16.9-5-2

REQUIRED FIRE DAMPERS

DAMPER NUMBER	BLDG	LOCATION	ELEVATION	FIRE AREA INTERFACE	RISK CRITERIA	REMEDIAL ACTION CONDITION
2CRA-FD022B	AUX	59-60/DD-EE	574+0	22/46	LSS	B
2CRA-FD023	AUX	59-60/EE	577+0	18/22	DID	C
2CRA-FD025	AUX	60-61/EE	577+0	18/22	DID	C
2CRA-FD026	AUX	59-60/EE	568+0	11/22	DID	C
2CRA-FD027	AUX	59-60/EE	568+0	11/22	DID	C
2CR-FD001	AUX	58-59/DD-EE	594+0	21/22	HSS	A
2CR-FD002	AUX	58-59/DD	594+0	21/22	HSS	A
2CR-FD003	AUX	63-64/CC	594+0	12/19	HSS	A
1VF-FD001A	AUX	51, NN-PP	605+10	22/24	LSS	B
1VF-FD001B	AUX	51, NN-PP	605+10	22/24	LSS	B
1VF-FD002A	AUX	50-51/NN-PP	631+6	24/38	DID	C
1VF-FD002B	AUX	50-51/NN-PP	631+6	24/38	DID	C
1VF-FD004	AUX	49/PP-QQ	631+6	24/38	DID	C
1VF-FD005	AUX	49-50/PP-QQ	631+6	24/38	DID	C
1VF-FD006	AUX	50-51	631+6	24/38	DID	C
1VF-FD007	AUX	50-51/KK-LL	605+10	22/24	LSS	B
1VF-FD010	AUX	50-51/KK	605+10	22/24	LSS	B
1VF-FD011	AUX	50-51/JJ-KK	631+6	22/38	LSS	B
1VF-FD013	AUX	50-51/JJ-KK	616+10	22/24	LSS	B
1VF-FD014	AUX	50-51/JJ-KK	616+10	22/24	LSS	B
2VF-FD001A	AUX	63, NN-PP	605+10	22/23	LSS	B
2VF-FD001B	AUX	63, NN-PP	605+10	22/23	LSS	B
2VF-FD002A	AUX	63-64/NN-PP	631+6	23/47	DID	C
2VF-FD002B	AUX	63-64/NN-PP	631+6	23/47	DID	C
2VF-FD004	AUX	65/PP-QQ	631+6	23/47	DID	C
2VF-FD005	AUX	64-65/PP-QQ	631+6	23/47	DID	C
2VF-FD006	AUX	63-64/PP-QQ	631+6	23/47	DID	C
2VF-FD007	AUX	63-64/KK-LL	605+10	22/23	LSS	B
2VF-FD010	AUX	63-64/KK	605+10	22/23	LSS	B
2VF-FD011	AUX	64-64/JJ-KK	631+6	22/47	LSS	B
2VF-FD013	AUX	63-64/JJ-KK	616+10	22/23	LSS	B
2VF-FD014	AUX	63-64/JJ-KK	616+10	22/23	LSS	B
1TB-FD001	TB1	18-19/V	594+0	TB1/SRV	DID	C
1TB-FD002	TB1	18-19/V	594+0	TB1/SRV	DID	C
1TB-FD003	TB1	18-19/V	594+0	TB1/SRV	DID	C
1TB-FD004	TB1	18-19/V	594+0	TB1/SRV	DID	C
1TB-FD005	TB1	18-19/V	594+0	TB1/SRV	DID	C
1TB-FD006	TB1	18-19/V	594+0	TB1/SRV	DID	C
1TB-FD007	TB1	21-22/V	594+0	TB1/SRV	DID	C
1TB-FD008	TB1	21-22/V	594+0	TB1/SRV	DID	C
1TB-FD009	TB1	21-22/V	594+0	TB1/SRV	DID	C
1TB-FD010	TB1	21-22/V	594+0	TB1/SRV	DID	C
1TB-FD011	TB1	21-22/V	594+0	TB1/SRV	DID	C
1TB-FD012	TB1	21-22/V	594+0	TB1/SRV	DID	C
1TB-FD032	TB1	18-19/V	594+0	TB1/SRV	DID	C

(continued)

Table 16.9-5-2

REQUIRED FIRE DAMPERS

DAMPER NUMBER	BLDG	LOCATION	ELEVATION	FIRE AREA INTERFACE	RISK CRITERIA	REMEDIAL ACTION CONDITION
1TB-FD038	TB1	16-17/V	594+0	TB1/SRV	DID	C
1TB-FD039	TB1	16-17/V	594+0	TB1/SRV	DID	C
1TB-FD040	TB1	16/V	594+0	TB1/SRV	DID	C
1TB-FD043	TB1	30-31/1J-1K	568+0	TB1/OTT	DID	C
1TB-FD044	TB1	32/1J-1K	594+0	TB1/MTOT	DID	C
1TB-FD045	TB1	30/1J-1K	594+0	TB1/MTOT	DID	C
1TB-FD046	TB1	32/1K-1L	568+0	TB1/OTT	DID	C
2TB-FD013	TB2	21-22/P	594+0	TB2/SRV	DID	C
2TB-FD014	TB2	21-22/P	594+0	TB2/SRV	DID	C
2TB-FD015	TB2	21-22/P	594+0	TB2/SRV	DID	C
2TB-FD016	TB2	21-22/P	594+0	TB2/SRV	DID	C
2TB-FD017	TB2	21-22/P	594+0	TB2/SRV	DID	C
2TB-FD018	TB2	21-22/P	594+0	TB2/SRV	DID	C
2TB-FD019	TB2	18-19/P	594+0	TB2/SRV	DID	C
2TB-FD020	TB2	18-19/P	594+0	TB2/SRV	DID	C
2TB-FD021	TB2	18-19/P	594+0	TB2/SRV	DID	C
2TB-FD022	TB2	18-19/P	594+0	TB2/SRV	DID	C
2TB-FD023	TB2	18-19/P	594+0	TB2/SRV	DID	C
2TB-FD024	TB2	18-19/P	594+0	TB2/SRV	DID	C
2TB-FD031	TB2	32/2K-2L	568+0	TB2/OTT	DID	C
2TB-FD032	TB2	18/P	594+0	TB2/SRV	DID	C
2TB-FD036	TB2	16-17/P	594+0	TB2/SRV	DID	C
2TB-FD038	TB2	17-18/P	594+0	TB2/SRV	DID	C
2TB-FD039	TB2	32/2J-2K	594+0	TB2/MTOT	DID	C
2TB-FD040	TB2	30/2J-2K	594+0	TB2/MTOT	DID	C
2TB-FD041	TB2	30-31/2J/2K	568+0	TB2/OTT	DID	C

*2VA-FD070 is exempt from inspection requirements (SLC TR 16.9-5-5) for ALARA reasons

Table 16.9-5-3

HIGH SAFETY SIGNIFICANT (HSS) FIRE AREAS*

FIRE AREA	BLDG	ELEVATION	DESCRIPTION
6	AUX	560+0	Unit 1 Electrical Pen Room El 560
12	AUX	577+0	Unit 2 Electrical Pen Room El 577
13	AUX	577+0	Unit 1 Electrical Pen Room El 577
14	AUX	577+0	Unit 2 4160V Essential Swgr Room (2ETA)
15	AUX	577+0	Unit 1 4160V Essential Swgr Room (1ETA)
16	AUX	574+0	Unit 2 Cable Room El 574
17	AUX	574+0	Unit 1 Cable Room El 574
21	AUX	594+0	Main Control Room El 594

*High Safety Significant (HSS) Fire Areas are defined as the areas with HSS fire barrier features in accordance with the Catawba NFPA 805 Monitoring Program.

Table 16.9-5-4

FIRE AREAS AND SHUTDOWN TRAIN / METHOD

FIRE AREA	FIRE AREA DESCRIPTIONS	ASSURED SHUTDOWN TRAIN / METHOD
1	ND & NS Pump Room El 522 (Common)	SSS
2	Unit 2 CA Pump Room El 543	SSS
3	Unit 1 CA Pump Room El 543	SSS
4	Aux Bldg. Gen Area & NV Pump Room El 543 (Common)	SSS
5	Unit 2 Electrical Pen Room El 560	A
6	Unit 1 Electrical Pen Room El 560	A
7	Unit 2 4160V Essential SWGR Room El 560	A
8	Unit 1 4160V Essential SWGR Room El 560	A
9	Unit 2 Battery Room El 554	SSS
10	Unit 1 Battery Room El 554	SSS
11	Aux Bldg. Gen Area & U1 KC Pump Room El 560 (Common)	SSS
12	Unit 2 Electrical Pen Room El 577	B
13	Unit 1 Electrical Pen Room El 577	B
14	Unit 2 4160V Essential SWGR Room El 577	B
15	Unit 1 4160V Essential SWGR Room El 577	B
16	Unit 2 Cable Room El 574	SSS
17	Unit 1 Cable Room El 574	SSS
18	Aux Bldg. Gen Area & U2 KC Pump Room El 577 (Common)	SSS
19	Unit 2 Electrical Pen Room El 594	A
20	Unit 1 Electrical Pen Room El 594	A
21	Control Room El 594 (Common)	SSS
22	Aux Bldg. Gen Area El 594 (Common)	SSS
23	Unit 2 Fuel Storage Area El 605	A
24	Unit 1 Fuel Storage Area El 605	A
25	Diesel Generator Bldg. 1A El 556	B
25A	Diesel Generator Bldg. 1A Stairwell	B
26	Diesel Generator Bldg. 1B El 556	A
26B	Diesel Generator Bldg. 1B Stairwell	A
27	Diesel Generator Bldg. 2A El 556	B
27A	Diesel Generator Bldg. 2A Stairwell	B
28	Diesel Generator Bldg. 2B El 556	A
28B	Diesel Generator Bldg. 2B Stairwell	A
29	Train A RN Pump Structure El 600 (Common)	B
30	Train B RN Pump Structure El 600 (Common)	A
31	Unit 2 Train A Aux Shutdown Panel El 543	B
32	Unit 1 Train A Aux Shutdown Panel El 543	B
33	Unit 2 Train B Aux Shutdown Panel El 543	A
34	Unit 1 Train B Aux Shutdown Panel El 543	A
35	Control Room Tagout Area El 594	A or B
36	Unit 2 Turbine Driven CA Pump Control Panel Room El 543	B
37	Unit 1 Turbine Driven CA Pump Control Panel Room El 543	B
38	Unit 1 Fuel Storage Area HVAC Room El 631	A or B

(continued)

Table 16.9-5-4

FIRE AREAS AND SHUTDOWN TRAIN / METHOD

FIRE AREA	FIRE AREA DESCRIPTIONS	ASSURED SHUTDOWN TRAIN / METHOD
39	Unit 2 Turbine Driven CA Pump Pit El 543	B
40	Unit 1 Turbine Driven CA Pump Pit El 543	B
41	DG1A Sequencer Tunnel El 556	B
42	DG1B Sequencer Tunnel El 556	A
43	DG2A Sequencer Tunnel El 556	B
44	DG2B Sequencer Tunnel El 556	A
45	Unit 1 Cable Room Corridor El 574	B
46	Unit 2 Cable Room Corridor El 574	B
47	Unit 2 Fuel Storage Area HVAC Room El 631	A or B
48	Unit 2 Interior Doghouse	A and B
49	Unit 1 Interior Doghouse	A and B
50	Unit 2 Exterior Doghouse	A and B
51	Unit 1 Exterior Doghouse	A and B
ASB	Auxiliary Service Building	A or B
RB1	Unit 1 Reactor Building	A and B
RB2	Unit 2 Reactor Building	A and B
SRV	Service Building	B
SSF	Standby Shutdown Facility	A or B
STAIR*	Stairway	See Note
TB1	Unit 1 Turbine Building	A or B
TB2	Unit 2 Turbine Building	A or B
YRD**	Yard Area	A or B

* IF the barrier in a stairway is adjacent to a HSS Fire Area (see Table 16.9-5-3), enter CONDITION A; otherwise enter CONDITION C.
** Exterior walls that interface with the YRD do not require entry into a CONDITION statement and therefore do not have a REQUIRED ACTION.

A = A TRAIN
B = B TRAIN
SSS = STANDBY SHUTDOWN SYSTEM

BASES

The functional integrity of the Fire Rated Assemblies and associated sealing devices ensures that fires will be confined or adequately retarded so as not to spread between fire areas/compartments.

The fire barriers and associated penetration seals are passive elements in the facility fire protection program and are subject to periodic inspections.

Risk-informed insights from the Fire PRA process can apply to compensatory actions. The safety significance of the fire area can provide relief for required compensatory actions. In addition, the presence of functional fire detection can reduce the required compensatory actions. Functional fire detection in the area provides early warning of a fire for fire brigade response. Fire detection can provide a compensatory action equivalent to or better than fire watch.

Fire barrier penetration seals, including cable/pipe penetration seals and fire dampers, are considered FUNCTIONAL when the visually observed condition indicates no abnormal change or abnormal degradation. An evaluation is performed to determine the cause of any identified fire barrier penetration seal abnormal change in appearance or abnormal degradation and the effect of this change on the ability of the fire barrier penetration seal to perform its function. Based on this evaluation additional inspections may be performed.

Access to Fire Damper 2VA-FD070 is in a locked Hi-Rad area. Due to ALARA reasons, this damper is exempt from inspection requirements (SLC TR 16.9-5-5). The technical justification for excluding this damper from inspection is in calculation CNC-1435.00-00-0035.

During periods of time when a barrier is not FUNCTIONAL, either:

(1) Perform the recommended fire watch in accordance with the criteria in the remedial actions, or

(2) a licensee may choose to implement a different required action or a combination of actions (e.g., additional administrative controls, operator briefings, temporary procedures, interim shutdown strategies, operator manual actions, temporary fire barriers, temporary detection or suppression systems). Such a change must be made to the approved Fire Protection Plan (FPP). However, the licensee must complete a documented evaluation of the impact of the proposed required action to the FPP. The evaluation must demonstrate that the required actions would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. Any change to the FPP must maintain compliance with the General Design Criteria and 10 CFR 50.48(a).

The evaluation of the required action should incorporate risk insights regarding the location, quantity, and type of combustible material in the fire area; the presence of ignition sources and their likelihood of occurrence; the automatic fire suppression and the fire detection capability in the fire area; the manual fire suppression capability in the fire area; and the human error probability where applicable.

BASES (continued)

The expectation is to promptly complete the corrective action at the first available opportunity and eliminate the reliance on the required action.

This SLC is part of the Catawba Fire Protection Program and therefore subject to the provisions of Section 2.C.(5) of the Catawba Renewed Facility Operating Licenses.

REFERENCES

1. Catawba UFSAR, Section 9.5.1.
2. Catawba Nuclear Station 10 CFR 50.48(c) Fire Protection Safety Evaluation (SE).
3. Catawba Plant Design Basis Specification for Fire Protection, CNS-1465.00-00-0006, as revised.
4. Catawba UFSAR, Section 18.2.8.
5. Catawba License Renewal Commitments, CNS-1274.00-00-0016, Section 4.12.2.
6. NRC Regulatory Issue Summary 2005-07, Compensatory Measures to Satisfy the Fire Protection Program Requirements, April 19, 2005.
7. Catawba Renewed Facility Operating License Conditions 2.C.(5).
8. CNC-1435.00-00-0084, Catawba NFPA 805 Monitoring Program.
9. CNC-1435.00-00-0044, Fire Protection Nuclear Safety Capability Assessment.
10. CNC-1435.00-00-0035, Penetration Seal Data Base and 86-10 Evaluations.
11. CN-1209.10 series drawings.
12. CN-1105 series drawings.