

10 CFR 50.90

RS-07-117  
October 9, 2007U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Quad Cities Nuclear Power Station, Units 1 and 2  
Renewed Facility Operating License Nos. DPR-29 and DPR-30  
NRC Docket Nos. 50-254 and 50-265

**Subject:** Application for Technical Specification Change TSTF-423, Risk Informed Modification to Selected Required Action End States for BWR Plants, Using the Consolidated Line Item Improvement Process

**Reference:** TSTF-423, Revision 0, "Technical Specifications End States, NEDC-32988-A, Revision 2"

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," Exelon Generation Company, LLC (EGC) is requesting a change to the Technical Specifications (TS) of Renewed Facility Operating License Nos. DPR-29 and DPR-30 for Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2. The proposed amendment would modify TS to risk-inform requirements regarding selected Required Action End States as provided in the referenced document.

Attachment 1 provides a description of the proposed change, the requested confirmation of applicability, and plant-specific verifications. Attachment 2 provides the existing TS pages marked up to show the proposed change. Attachment 3 provides the existing TS Bases pages marked up to show the proposed change. The TS Bases pages are provided for information only and do not require NRC approval. Attachment 4 provides a summary of the regulatory commitments made in this submittal.

Changes to the TS are consistent with the changes outlined in the referenced document; minor deviations are discussed in Attachment 1. QCNPS Units 1 and 2 TS are based on NUREG-1433, "Standard Technical Specifications General Electric Plants, BWR/4," though it is not identical to this guidance. Therefore, an adaptation of the referenced document was required.

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EGC requests approval of the proposed license amendment by October 9, 2008, with implementation within 120 days of issuance.

This amendment request has been reviewed and approved by the QCNPS Plant Operations Review Committee and the Nuclear Safety Review Board in accordance with the requirements of the EGC Quality Assurance Program.

In accordance with 10 CFR 50.91, "Notice for public comment," EGC is notifying the State of Illinois of this application for amendment by transmitting a copy of this letter and its attachments to the designated State Official.

If you have any questions concerning this letter, please contact Ms. Michelle Yun at (630) 657-2818.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 9<sup>th</sup> day of October 2007.

Respectfully,



Jeffrey L. Hansen  
Manager – Licensing  
Exelon Generation Company, LLC

- Attachment 1: Description and Assessment
- Attachment 2: Mark-up of Proposed Technical Specification Changes
- Attachment 3: Mark-up of Technical Specification Bases Changes
- Attachment 4: List of Regulatory Commitments

**ATTACHMENT 1**  
Description and Assessment

Subject: Application for Technical Specification Change TSTF-423, Risk Informed Modification to Selected Required Action End States for BWR Plants, Using the Consolidated Line Item Improvement Process

1.0 DESCRIPTION

2.0 ASSESSMENT

2.1 Applicability of Topical Report, TSTF-423, and Published Safety Evaluation

2.2 Optional Changes and Variations

3.0 REGULATORY ANALYSIS

3.1 No Significant Hazards Consideration Determination

3.2 Verification and Commitments

4.0 ENVIRONMENTAL EVALUATION

5.0 IMPACT ON PREVIOUS SUBMITTALS

6.0 REFERENCES

**ATTACHMENT 1**  
Description and Assessment

**1.0 DESCRIPTION**

The proposed amendment would modify Technical Specifications (TS) to risk-informed requirements regarding selected Required Action End States.

The changes are consistent with the Nuclear Regulatory Commission (NRC) approved Industry/Technical Specification Task Force (TSTF) TSTF-423, Revision 0, "Technical Specifications End States, NEDC-32988-A," except as described in Section 2.2 below. The availability of this TS improvement was published in the *Federal Register* on March 23, 2006 as part of the Consolidated Line Item Improvement Process (CLIIP).

**2.0 ASSESSMENT**

**2.1 Applicability of Topical Report, TSTF-423, and Published Safety Evaluation**

Exelon Generation Company, LLC (EGC) has reviewed the General Electric (GE) topical report (i.e., Reference 1), TSTF-423 (i.e., Reference 2), and the NRC model Safety Evaluation (i.e., Reference 3) as part of the CLIIP. EGC has concluded that the information in the GE topical report and TSTF-423, as well as the safety evaluation prepared by the NRC, are applicable to Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2 and provide justification for the incorporation of the proposed changes into the QCNPS, Units 1 and 2 TS.

**2.2 Optional Changes and Variations**

EGC is proposing the following variations or deviations from the GE topical report, TS changes described in the TSTF-423, Revision 0, or the NRC's model safety evaluation, dated March 23, 2006.

TSTF-423 is based on NUREG-1433, "Standard Technical Specifications General Electric Plants, BWR/4." QCNPS, Units 1 and 2 TS are based on NUREG-1433, but are not identical to this guidance. As a result, an adaptation of TSTF-423 was required, in some cases, for implementation into the QCNPS, Units 1 and 2 TS due to the minor administrative differences in format (e.g., condition letter designation, etc).

Proposed changes made to STS 3.3.8.2, "RPS Electric Power Monitoring," already exist in QCNPS, Units 1 and 2 TS 3.3.8.2 and are therefore not included as a proposed change in this submittal.

STS 3.6.1.9, "Main Steam Isolation Valve (MSIV) Leakage Control System (LCS)," STS 3.7.2, "Plant Service Water (PSW) System and Ultimate Heat Sink (UHS)," and STS 3.8.7, "Inverters – Operating," do not exist in QCNPS, Units 1 and 2 TS and are therefore not included as a proposed change in this submittal. Therefore, the aforementioned TSTF changes are not part of this submittal.

**ATTACHMENT 1**  
Description and Assessment

**3.0 REGULATORY ANALYSIS**

**3.1 No Significant Hazards Consideration Determination**

Exelon Generation Company, LLC (EGC) has reviewed the proposed No Significant Hazards Consideration Determination (NSHCD) published in the *Federal Register* as part of the Consolidated Line Item Improvement Process (CLIP), (i.e., Reference 3). EGC has concluded that the proposed NSHCD presented in the *Federal Register* notice is applicable to Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2 and is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a), "Notice for public comment."

**3.2 Verification and Commitments**

As discussed in the notice of availability published in the *Federal Register* on March 23, 2006 for this TS improvement, plant-specific verifications were performed as follows.

EGC commits to the regulatory commitments in Attachment 4. In addition, EGC has proposed TS Bases consistent with the GE topical report and TSTF-423, which provide guidance and details on how to implement the new requirements. Implementation of TSTF-423 requires that risk be managed and assessed. EGC's configuration risk management program is adequate to satisfy this requirement. The risk assessment need not be quantified, but may be a qualitative assessment of the vulnerability of systems and components when one or more systems are not able to perform their associated function. Finally, EGC has a Bases Control Program consistent with Section 5.5 of the Standard Technical Specifications (STS).

**4.0 ENVIRONMENTAL EVALUATION**

The amendment changes requirements with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, "Standards for Protection Against Radiation." The NRC staff has determined that the amendment adopting TSTF-423, Revision 0, involves no significant increase in amounts of effluents that may be released offsite, no significant changes in the types of effluents that may be released offsite, and no significant increases in the individual or cumulative occupational radiation exposure. The NRC has previously issued a proposed finding that TSTF-423, Revision 0, involves no significant hazards considerations and there has been no public comment on the finding in the *Federal Register* Notice 70 FR 74037, December 14, 2005. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9), "Criterion for categorical exclusion." In accordance with 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

**ATTACHMENT 1**  
Description and Assessment

**5.0 IMPACT ON PREVIOUS SUBMITTALS**

This amendment seeks to execute changes on TS that currently has a pending amendment. The following TS has the associated amendment pending.

TSTF-448, Control Room Habitability	3.7.4 –1 B 3.7.4 – 2 B 3.7.4 – 4 to B 3.7.4 – 6	Submitted 4/12/07
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**6.0 REFERENCES**

1. NEDC-32988-A, Revision 2, "Technical Justification to Support Risk-Informed Modification to Selected Required Action End States for BWR Plants," December 2002
2. TSTF-423, Revision 0, "Technical Specifications End States, NEDC-32988-A"
3. Volume 71, Federal Register, Page 14726 (71FRN14726), "Notice of Availability of Model Application Concerning Technical Specifications for Boiling Water Reactor Plants to Risk-Inform Requirements Regarding Selected Required Action End States Using the Consolidated Line Item Improvement Process," dated March 23, 2006

## ATTACHMENT 2

### Mark-up of Proposed Technical Specification Page Changes

#### Revised Technical Specification Pages

3.4.3 -1  
3.5.1 -1  
3.5.1 -2  
3.5.1 -3  
3.5.3 -1  
3.6.1.1 -1  
3.6.1.6 -1  
3.6.1.7 -2  
3.6.1.8 -1  
3.6.2.3 -1  
3.6.2.4 -1  
3.6.4.1 -1  
3.6.4.3 -1  
3.6.4.3 -2  
3.7.1-1  
3.7.1 -2  
3.7.4 -1  
3.7.5 -1  
3.7.6 -1  
3.8.1 -5  
3.8.4 -3  
3.8.7 -2

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.3 Safety and Relief Valves

LC0 3.4.3 The safety function of 9 safety valves shall be OPERABLE.

AND

The relief function of 5 relief valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One relief valve inoperable.	A.1 Restore the relief valve to OPERABLE status.	14 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3.	12 hours
<del>OR</del>	<del>B.2 Be in MODE 4.</del>	<del>36 hours</del>
<input type="checkbox"/> C. Two or more relief valves inoperable.	C.1 Be in MODE 3.	12 hours
<u>OR</u>	AND	
One or more safety valves inoperable.	C.2 Be in MODE 4.	36 hours

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.1 ECCS-Operating

LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of five relief valves shall be OPERABLE.

APPLICABILITY: MODE 1,  
MODES 2 and 3, except high pressure coolant injection (HPCI) and ADS valves are not required to be OPERABLE with reactor steam dome pressure  $\leq$  150 psig.

ACTIONS

-----NOTE-----  
LCO 3.0.4.b is not applicable to HPCI.  
-----

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Low Pressure Coolant Injection (LPCI) pump inoperable.	A.1 Restore LPCI pump to OPERABLE status.	30 days
B. One LPCI subsystem inoperable for reasons other than Condition A.  <u>OR</u>  One Core Spray subsystem inoperable.	B.1 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	7 days
C. One LPCI pump in each subsystem inoperable.	C.1 Restore one LPCI pump to OPERABLE status.	7 days

(continued)

D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Be in MODE 3.	12 hours
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ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<del>D.</del> <b>E.</b> Two LPCI subsystems inoperable for reasons other than Condition C.	<del>D.1</del> <b>E.1</b> Restore one LPCI subsystem to OPERABLE status.	72 hours
<del>F.</del> <b>F.</b> Required Action and associated Completion Time of Condition <del>A</del> , <b>E</b> , <del>B</del> , <del>C</del> , or <del>D</del> not met.	<del>F.1</del> <b>F.1</b> Be in MODE 3. AND <del>F.2</del> <b>F.2</b> Be in MODE 4.	12 hours  36 hours
<b>G.</b> <del>F.</del> HPCI System inoperable.	<del>F.1</del> <b>G.1</b> Verify by administrative means RCIC System is OPERABLE. AND <del>F.2</del> <b>G.2</b> Restore HPCI System to OPERABLE status.	Immediately  14 days
<b>H.</b> <del>F.</del> One ADS valve inoperable.	<del>G.1</del> <b>H.1</b> Restore ADS valve to OPERABLE status.	14 days
<b>J.</b> <del>F.</del> Required Action and associated Completion Time of Condition <del>F</del> or <del>G</del> not met. <del>OR</del> Two or more ADS valves inoperable.	<del>H.1</del> <b>J.1</b> Be in MODE 3. AND <del>H.2</del> <b>J.2</b> Reduce reactor steam dome pressure to ≤ 150 psig.	12 hours  36 hours
(continued)		
<b>I.</b> Required Action and associated Completion Time of Condition <del>G</del> or <del>H</del> not met.	<b>I.1</b> Be in MODE 3.	12 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p><del>K.1</del> Two or more low pressure ECCS injection/spray subsystems inoperable for reasons other than Condition C or <del>D</del>. <u>E</u></p> <p><u>OR</u></p> <p>HPCI System and one or more ADS valves inoperable.</p> <p><u>OR</u></p> <p>One or more low pressure ECCS injection/spray subsystems inoperable and one or more ADS valves inoperable.</p> <p><u>OR</u></p> <p>HPCI System inoperable and either one low pressure ECCS injection/spray subsystem is inoperable or Condition C entered.</p>	<p><del>I.1</del></p> <p><u>K.1</u> Enter LCO 3.0.3</p>	<p>Immediately</p>

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.3 RCIC System

LCO 3.5.3 The RCIC System shall be OPERABLE.

APPLICABILITY: MODE 1,  
MODES 2 and 3 with reactor steam dome pressure > 150 psig.

ACTIONS

-----NOTE-----  
LCO 3.0.4.b is not applicable to RCIC.  
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CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCIC System inoperable.	A.1 Verify by administrative means High Pressure Coolant Injection System is OPERABLE.	Immediately
	<u>AND</u> A.2 Restore RCIC System to OPERABLE status.	14 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours
	<del>B.2 Reduce reactor steam dome pressure to <math>\leq</math> 150 psig.</del>	<del>36 hours</del>

3.6 CONTAINMENT SYSTEMS

3.6.1.1 Primary Containment

LCO 3.6.1.1 Primary containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Primary containment inoperable.	A.1 Restore primary containment to OPERABLE status.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours
	<del>B.2 Be in MODE 4.</del>	<del>36 hours</del>

3.6 CONTAINMENT SYSTEMS

3.6.1.6 Low Set Relief Valves

LC0 3.6.1.6 The low set relief function of two relief valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One low set relief valve inoperable.	A.1 Restore low set relief valve to OPERABLE status.	14 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3.	12 hours
	<del>B.2 Be in MODE 4.</del>	<del>36 hours</del>
<del>OR</del>		
C. Two low set relief valves inoperable.	C.1 Be in MODE 3.	12 hours
	C.2 Be in MODE 4.	36 hours

Reactor Building-to-Suppression Chamber Vacuum Breakers  
3.6.1.7

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">E. 0.</div> Two lines with one or more reactor building-to-suppression chamber vacuum breakers inoperable for opening.	<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">0.1</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">E.</div> Restore all vacuum breakers in one line to OPERABLE status.	1 hour
<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">F. 1.</div> Required Action and Associated Completion Time not met.	<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">F.1</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">AND</div> <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">F.2</div> Be in MODE 3. Be in MODE 4.	12 hours 36 hours
<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">D.</div> Required Action and Associated Completion Time of Condition C not met.	<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">D.1</div> Be in MODE 3.	12 hours

of Conditions A, B or E

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.1.7.1	-----NOTES----- 1. Not required to be met for vacuum breakers that are open during Surveillances.  2. Not required to be met for vacuum breakers open when performing their intended function.  -----  Verify each vacuum breaker is closed.	14 days
SR 3.6.1.7.2	Perform a functional test of each vacuum breaker.	92 days

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.1.8 Suppression Chamber-to-Drywell Vacuum Breakers

LC0 3.6.1.8 Nine suppression chamber-to-drywell vacuum breakers shall be OPERABLE for opening.

AND

Twelve suppression chamber-to-drywell vacuum breakers shall be closed.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required suppression chamber-to-drywell vacuum breaker inoperable for opening.	A.1 Restore one vacuum breaker to OPERABLE status.	72 hours
<input checked="" type="checkbox"/> C. One suppression chamber-to-drywell vacuum breaker not closed.	<del>B.1</del> <input checked="" type="checkbox"/> C.1 Close the open vacuum breaker.	4 hours
<input checked="" type="checkbox"/> D. Required Action and associated Completion Time not met. <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-left: 20px;">of Condition C</div>	<del>C.1</del> <input checked="" type="checkbox"/> D.1 Be in MODE 3.	12 hours
	<del>C.2</del> <input checked="" type="checkbox"/> D.2 Be in MODE 4.	36 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3	12 hours

3.6 CONTAINMENT SYSTEMS

3.6.2.3 Residual Heat Removal (RHR) Suppression Pool Cooling

LCO 3.6.2.3 Two RHR suppression pool cooling subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR suppression pool cooling subsystem inoperable.	A.1 Restore RHR suppression pool cooling subsystem to OPERABLE status.	7 days
<input checked="" type="checkbox"/> <del>B.</del> Two RHR suppression pool cooling subsystems inoperable.	<input checked="" type="checkbox"/> <del>B.1</del> Restore one RHR suppression pool cooling subsystem to OPERABLE status.	8 hours
<input checked="" type="checkbox"/> <del>D.</del> Required Action and associated Completion Time not met. ↑ <input type="checkbox"/> of Condition C	<input checked="" type="checkbox"/> <del>D.1</del> Be in MODE 3.	12 hours
	<input checked="" type="checkbox"/> <del>D.2</del> Be in MODE 4.	36 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3	12 hours

3.6 CONTAINMENT SYSTEMS

3.6.2.4 Residual Heat Removal (RHR) Suppression Pool Spray

LCO 3.6.2.4 Two RHR suppression pool spray subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR suppression pool spray subsystem inoperable.	A.1 Restore RHR suppression pool spray subsystem to OPERABLE status.	7 days
B. Two RHR suppression pool spray subsystems inoperable.	B.1 Restore one RHR suppression pool spray subsystem to OPERABLE status.	8 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. <del>AND</del> <del>C.2 Be in MODE 4.</del>	12 hours <del>36 hours</del>

3.6 CONTAINMENT SYSTEMS

3.6.4.1 Secondary Containment

LCO 3.6.4.1 The secondary containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,  
During movement of recently irradiated fuel assemblies in  
the secondary containment,  
During operations with a potential for draining the reactor  
vessel (OPDRVs).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Secondary containment inoperable in MODE 1, 2, or 3.	A.1 Restore secondary containment to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3.	12 hours
	<del>AND</del> <del>B.2 Be in MODE 4.</del>	<del>36 hours</del>
C. Secondary containment inoperable during movement of recently irradiated fuel assemblies in the secondary containment or during OPDRVs.	C.1 -----NOTE----- LCO 3.0.3 is not applicable. ----- Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately
	<del>AND</del> C.2 Initiate action to suspend OPDRVs.	Immediately

3.6 CONTAINMENT SYSTEMS

3.6.4.3 Standby Gas Treatment (SGT) System

LCO 3.6.4.3 Two SGT subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,  
During movement of recently irradiated fuel assemblies in  
the secondary containment,  
During operations with a potential for draining the reactor  
vessel (OPDRVs).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SGT subsystem inoperable.	A.1 Restore SGT subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, or 3.	B.1 Be in MODE 3.	12 hours
	<del>B.2 Be in MODE 4.</del>	<del>36 hours</del>
C. Required Action and associated Completion Time of Condition A not met during movement of recently irradiated fuel assemblies in the secondary containment or during OPDRVs.	-----NOTE----- LCO 3.0.3 is not applicable. -----	Immediately
	C.1 Place OPERABLE SGT subsystem in operation.  <u>OR</u>	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2.1 Suspend movement of recently irradiated fuel assemblies in secondary containment.	Immediately
	<p style="text-align: center;"><u>AND</u></p> C.2.2 Initiate action to suspend OPDRVs.	Immediately
D. Two SGT subsystems inoperable in MODE 1, 2, or 3.	D.1 Restore one SGT subsystem to OPERABLE status.	1 hour
E. Required Action and associated Completion Time of Condition D not met.	E.1 Be in MODE 3.	12 hours
	<p style="text-align: center;"><del>AND</del></p> <del>E.2 Be in MODE 4.</del>	<del>36 hours</del>
F. Two SGT subsystems inoperable during movement of recently irradiated fuel assemblies in the secondary containment or during OPDRVs.	F.1 -----NOTE----- LCO 3.0.3 is not applicable. ----- Suspend movement of recently irradiated fuel assemblies in secondary containment.	Immediately
	<p style="text-align: center;"><u>AND</u></p> F.2 Initiate action to suspend OPDRVs.	Immediately

3.7 PLANT SYSTEMS

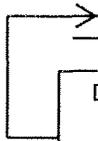
3.7.1 Residual Heat Removal Service Water (RHRSW) System

LCO 3.7.1 Two RHRSW subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHRSW pump inoperable.	A.1 Restore RHRSW pump to OPERABLE status.	30 days
B. One RHRSW pump in each subsystem inoperable.	B.1 Restore one RHRSW pump to OPERABLE status.	7 days
C. One RHRSW subsystem inoperable for reasons other than Condition A.	C.1 -----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.4.7, "Residual Heat Removal (RHR) Shutdown Cooling System—Hot Shutdown," for RHR shutdown cooling subsystem made inoperable by RHRSW System. ----- Restore RHRSW subsystem to OPERABLE status.	7 days
(continued)		
D. Required Action and associated Completion Time of Conditions A, B, or C not met.	D.1 Be in MODE 3.	12 hours



ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p><del>E</del>. Both RHRSW subsystems inoperable for reasons other than Condition B.</p>	<p><del>E</del>.1 <del>E</del> -----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.4.7 for RHR shutdown cooling subsystems made inoperable by RHRSW System. ----- Restore one RHRSW subsystem to OPERABLE status.</p>	<p>8 hours</p>
<p><del>F</del>. Required Action and associated Completion Time not met. ↑ <span style="border: 1px solid black; padding: 2px;">of Condition E</span></p>	<p><del>F</del>.1 <del>F</del> Be in MODE 3. AND <del>F</del>.2 <del>F</del> Be in MODE 4.</p>	<p>12 hours  36 hours</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.7.1.1 Verify each RHRSW manual and power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position or can be aligned to the correct position.</p>	<p>31 days</p>



3.7 PLANT SYSTEMS

3.7.5 Control Room Emergency Ventilation Air Conditioning (AC) System

LCO 3.7.5 The Control Room Emergency Ventilation AC System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,  
During movement of recently irradiated fuel assemblies in the secondary containment,  
During operations with a potential for draining the reactor vessel (OPDRVs).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Control Room Emergency Ventilation AC System inoperable in MODE 1, 2, or 3.	A.1 Restore Control Room Emergency Ventilation AC System to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, or 3.	B.1 Be in MODE 3.	12 hours
	<del>AND</del> <del>B.2 Be in MODE 4.</del>	<del>36 hours</del>
C. Control Room Emergency Ventilation AC System inoperable during movement of recently irradiated fuel assemblies in the secondary containment or during OPDRVs.	-----NOTE----- LCO 3.0.3 is not applicable. -----	
	C.1 Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately
	<u>AND</u> C.2 Initiate action to suspend OPDRVs.	Immediately

3.7 PLANT SYSTEMS

3.7.6 Main Condenser Offgas

LCO 3.7.6 The gross gamma activity rate of the noble gases measured prior to the offgas holdup line shall be  $\leq 251,100 \mu\text{Ci/second}$  after decay of 30 minutes.

APPLICABILITY: MODE 1, MODES 2 and 3 with any main steam line not isolated and steam jet air ejector (SJAE) in operation.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Gross gamma activity rate of the noble gases not within limit.	A.1 Restore gross gamma activity rate of the noble gases to within limit.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Isolate all main steam lines.	12 hours
	<u>OR</u>	
	B.2 Isolate SJAE.	12 hours
	<u>OR</u>	
	B.3 <del>1</del> Be in MODE 3.	12 hours
	<del>AND</del>	
	<del>B.3.2 Be in MODE 4.</del>	<del>36 hours</del>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met.	F.1 Be in MODE 3. <del>AND</del> <del>F.2 Be in MODE 4.</del>	12 hours  <del>36 hours</del>
G. Three or more required AC sources inoperable.	G.1 Enter LCO 3.0.3.	Immediately



ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. One or more DC electrical power distribution subsystems inoperable.</p>	<p>B.1 Restore DC electrical power distribution subsystems to OPERABLE status.</p>	<p>2 hours <u>AND</u> 16 hours from discovery of failure to meet LCO 3.8.7.a</p>
<p>C. One or more required opposite unit AC or DC electrical power distribution subsystems inoperable.</p>	<p>-----NOTE----- Enter applicable Condition and Required Actions of LCO 3.8.1 when Condition C results in the inoperability of a required offsite circuit. ----- C.1 Restore required opposite unit AC and DC electrical power distribution subsystems to OPERABLE status.</p>	<p>7 days</p>
<p>D. Required Action and associated Completion Time of Condition A, B, or C not met.</p>	<p>D.1 Be in MODE 3. <del>AND</del> <del>D.2 Be in MODE 4.</del></p>	<p>12 hours <del>36 hours</del></p>
<p>E. Two or more electrical power distribution subsystems inoperable that, in combination, result in a loss of function.</p>	<p>E.1 Enter LCO 3.0.3.</p>	<p>Immediately</p>

**ATTACHMENT 3**  
Mark-up of Technical Specification Bases Page Changes  
(For Information Only)

**Revised Bases Pages**  
**(Provided for Information Only)**

B 3.4.3 -4 to B 3.4.3 -7  
B 3.5.1 -8 to B 3.5.1 -10  
B 3.5.1 -18  
B 3.5.3 -4  
B 3.5.3 -7  
B 3.6.1.1 -3  
B 3.6.1.1 -5  
B 3.6.1.6 -3 to B 3.6.1.6 -5  
B 3.6.1.7 -5  
B 3.6.1.7 -6  
B 3.6.1.8 -4 to B 3.6.1.8 -6  
B 3.6.2.3 -2 to B 3.6.2.3 -4  
B 3.6.2.4 -3  
B 3.6.2.4 -4  
B 3.6.4.1 -3  
B 3.6.4.1 -6  
B 3.6.4.3 -3 to B 3.6.4.3 -5  
B 3.6.4.3 -7  
B 3.7.1 -4 to B 3.7.1 -6  
B 3.7.4 -2  
B 3.7.4 -4 to B 3.7.4 -6  
B 3.7.5 -3  
B 3.7.5 -5  
B 3.7.6 -2  
B 3.7.6 -3  
B 3.8.1-16 to B 3.8.1 -20  
B 3.8.1 -22  
B 3.8.1 -24 to B 3.8.1 -28  
B 3.8.1 -30 to B 3.8.1 -34  
B 3.8.4 -10  
B 3.8.4 -12  
B 3.8.4 -14  
B 3.8.4 -15  
B 3.8.7 -9  
B 3.8.7 -10

BASES (continued)

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APPLICABILITY In MODES 1, 2, and 3, all safety and relief valves must be OPERABLE, since considerable energy may be in the reactor core and the limiting design basis transients are assumed to occur in these MODES. The safety and relief valves may be required to provide pressure relief to discharge energy from the core until such time that the Residual Heat Removal (RHR) System is capable of dissipating the core heat.

In MODE 4, decay heat is low enough for the RHR System to provide adequate cooling, and reactor pressure is low enough that the overpressure and MCPR limits are unlikely to be approached by assumed operational transients or accidents. In MODE 5, the reactor vessel head is unbolted or removed and the reactor is at atmospheric pressure. The safety and relief functions are not needed during these conditions.

---

ACTIONS

A.1

With the relief function of one relief valve (or S/RV) inoperable, the remaining OPERABLE relief valves are capable of providing the necessary protection. However, the overall reliability of the pressure relief system is reduced because additional failures in the remaining OPERABLE relief valves could result in failure to adequately relieve pressure during a limiting event. For this reason, continued operation is permitted for a limited time only.

The 14 day Completion Time to restore the inoperable required relief valve to OPERABLE status is based on the relief capability of the remaining relief valves, the low probability of an event requiring relief valve actuation, and a reasonable time to complete the Required Action.

Insert 1

→ C  
C ~~A.1 and A.2~~

With less than the minimum number of required safety valves OPERABLE, a transient may result in the violation of the ASME Code limit on reactor pressure. ~~If the relief function of the inoperable relief valves cannot be restored to OPERABLE status within the associated Completion Time of Required Action A.1, or if the relief function of two or more relief valves are inoperable, or if the safety function~~

(continued)

BASES

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ACTIONS

<sup>C</sup>~~B.1~~ and <sup>C</sup>~~B.2~~ (continued)

of one or more safety valves is inoperable, 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 MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

---

SURVEILLANCE  
REQUIREMENTS

SR 3.4.3.1

This Surveillance requires that the safety valves, including the S/RV, will open at the pressures assumed in the safety analysis of Reference 1. The demonstration of the safety valve and S/RV safety lift settings must be performed during shutdown, since this is a bench test, to be done in accordance with the Inservice Testing Program. The lift setting pressure shall correspond to ambient conditions of the valves at nominal operating temperatures and pressures. The safety valve and S/RV setpoints are  $\pm 1\%$  for OPERABILITY.

SR 3.4.3.2

The actuator of each of the Electromatic relief valves (ERVs) and the dual function safety/relief valves (S/RVs) is stroked to verify that the pilot valve strokes when manually actuated. For the S/RVs, the actuator test is performed by energizing a solenoid that pneumatically actuates a plunger located within the main valve body. The plunger is connected to the second stage disc. When steam pressure actuates the plunger during plant operation, this allows pressure to be vented from the top of the main valve piston, allowing reactor pressure to lift the main valve piston, which opens the main valve disc. The test will verify movement of the plunger in accordance with vendor recommendations. However, since this test is performed prior to establishing the reactor pressure needed to overcome main valve closure forces, the main valve disc will not stroke during the test.

(continued)

BASES

SURVEILLANCE  
REQUIREMENTS

SR 3.4.3.2 (continued)

For the ERVs, the actuator test is performed with the pilot valve actuator mounted in its normal position. This will allow testing of the manual actuation electrical circuitry, solenoid actuator, pilot operating lever, and pilot plunger. This test will verify pilot valve movement. However, since this test is performed prior to establishing the reactor pressure needed to overcome main valve closure spring force, the main valve will not stroke during the test.

This SR, together with the valve testing performed as required by the ASME Code for pressure relieving devices (ASME OM Code-1998 through 2000 Addenda), verify the capability of each relief valve to perform its function.

Valve testing will be performed at a steam test facility, where the valve (i.e., main valve and pilot valve) and an actuator representative of the actuator used at the plant will be installed on a steam header in the same orientation as the plant installation. The test conditions in the test facility will be similar to those in the plant installation, including ambient temperature, valve insulation, and steam conditions. The valve will then be leak tested, functionally tested to ensure the valve is capable of opening and closing (including stroke time), and leak tested a final time. Valve seat tightness will be verified by a cold bar test, and if not free of fog, leakage will be measured and verified to be below design limits. In addition, for the safety mode of S/RVs, an as-found setpoint verification and as-found leak check are performed, followed by verification of set pressure, and delay. The valve will then be shipped to the plant without any disassembly or alteration of the main valve or pilot valve components.

The combination of the valve testing and the valve actuator testing provide a complete check of the capability of the valves to open and close, such that full functionality is demonstrated through overlapping tests, without cycling the valves.

The 24 month Frequency ensures that each solenoid for each relief valve is tested. The 24 month Frequency was developed based on the relief valve tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. ~~5~~ **6**). Operating experience has shown that these components usually

(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.4.3.2 (continued)

pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.4.3.3

The relief valves, including the S/RV, are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to verify that the mechanical portions (i.e., solenoids) of the relief valve operate as designed when initiated either by an actual or simulated automatic initiation signal. The LOGIC SYSTEM FUNCTIONAL TESTs in LCO 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation," and LCO 3.3.6.3, "Relief Valve Instrumentation," overlap this SR to provide complete testing of the safety function.

The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by a Note that excludes valve actuation since the valves are individually tested in accordance with SR 3.4.3.2.

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REFERENCES

1. UFSAR, Section 5.2.2.1.
2. UFSAR, Section 15.2.3.1.
3. UFSAR, Section 15.2.2.1.
4. UFSAR, Chapter 15.
5. ASME, Boiler and Pressure Vessel Code, Section XI.

Insert 2

6

BASES

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ACTIONS            C.1 (continued)

evaluated the impact on ECCS availability, assuming various components and subsystems were taken out of service. The results were used to calculate the average availability of ECCS equipment needed to mitigate the consequences of a LOCA as a function of allowed outage times (i.e., Completion Times).

D.1

If two LPCI subsystems are inoperable for reasons other than Condition C, one inoperable subsystem must be restored to OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE CS subsystems provide adequate core cooling during a LOCA. However, overall ECCS reliability is reduced, because a single failure in one of the remaining CS subsystems, concurrent with a LOCA, may result in ECCS not being able to perform its intended safety function. The 72 hour Completion Time is based on a reliability study cited in Reference 10 that evaluated the impact on ECCS availability, assuming various components and subsystems were taken out of service. The results were used to calculate the average availability of ECCS equipment needed to mitigate the consequences of a LOCA as a function of allowable repair times (i.e., Completion Times).

E.1 and E.2

the

▽  
If ~~any~~ Required Action and associated Completion Time of Condition ~~A, B, C, or~~ D is not met, 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 12 hours and to MODE 4 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.

(continued)

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BASES

ACTIONS  
(continued)

F.1 and F.2

If the HPCI System is inoperable and the RCIC System is verified to be OPERABLE, the HPCI System must be restored to OPERABLE status within 14 days. In this Condition, adequate core cooling is ensured by the OPERABILITY of the redundant and diverse low pressure ECCS injection/spray subsystems in conjunction with ADS. Also, the RCIC System will automatically provide makeup water at most reactor operating pressures. Verification of RCIC OPERABILITY is therefore required immediately when HPCI is inoperable. This may be performed as an administrative check by examining logs or other information to determine if RCIC is out of service for maintenance or other reasons. It does not mean to perform the Surveillances needed to demonstrate the OPERABILITY of the RCIC System. If the OPERABILITY of the RCIC System cannot be verified, however, Condition H must be immediately entered. In the event of component failures concurrent with a design basis LOCA, there is a potential, depending on the specific failures, that the minimum required ECCS equipment will not be available. A 14 day Completion Time is based on a reliability study cited in Reference 10 and has been found to be acceptable through operating experience.

G.1

The LCO requires five ADS valves to be OPERABLE in order to provide the ADS function. With one ADS valve out of service, the overall reliability of the ADS is reduced, because a single failure in the OPERABLE ADS valves could result in a reduction in depressurization capability. Therefore, operation is only allowed for a limited time. The 14 day Completion Time is based on a reliability study cited in Reference 10 and has been found to be acceptable through operating experience.

Insert 1

~~F.1 and F.2~~

there is a reduction in the depressurization capability. The plant

~~If any Required Action and associated Completion Time of Condition F or G is not met, or if two or more required ADS valves are inoperable, the plant must be brought to a condition in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and reactor steam dome pressure reduced to~~

(continued)

BASES

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ACTIONS

~~I~~.1 and  ~~I~~.2 (continued)

≤ 150 psig 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.

~~J~~.1

When multiple ECCS subsystems are inoperable, as stated in Condition I, the plant is in a condition outside of the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

---

SURVEILLANCE  
REQUIREMENTS

SR 3.5.1.1

The flow path piping has the potential to develop voids and pockets of entrained air. Maintaining the pump discharge lines of the HPCI System, CS System, and LPCI subsystems full of water ensures that the ECCS will perform properly, injecting its full capacity into the RCS upon demand. This will also prevent a water hammer following an ECCS initiation signal. One acceptable method of ensuring that the lines are full is to vent at the high points. The 31 day Frequency is based on the gradual nature of void buildup in the ECCS piping, the procedural controls governing system operation, and operating experience.

(continued)

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BASES (continued)

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- REFERENCES
1. UFSAR, Section 6.3.2.1.
  2. UFSAR, Section 6.3.2.2.
  3. UFSAR, Section 6.3.2.3.
  4. UFSAR, Section 6.3.2.4.
  5. UFSAR, Section 15.6.4.
  6. UFSAR, Section 15.6.5.
  7. 10 CFR 50, Appendix K.
  8. UFSAR, Section 6.3.3.
  9. 10 CFR 50.46.
  10. Memorandum from R.L. Baer (NRC) to V. Stello, Jr. (NRC), "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.

Insert 2



BASES

ACTIONS  
(continued)

B.1 and B.2

overall plant risk is minimized.

Insert 1

is →

If the RCIC System cannot be restored to OPERABLE status within the associated Completion Time, or if the HPCI System is simultaneously inoperable, the plant must be brought to a condition in which the ~~LCO does not apply~~. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours ~~and reactor steam dome pressure reduced to < 150 psig within 36 hours~~. ~~The allowed Completion Times~~ <sup>is</sup> 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 3.5.3.1

The flow path piping has the potential to develop voids and pockets of entrained air. Maintaining the pump discharge line of the RCIC System full of water ensures that the system will perform properly, injecting its full capacity into the Reactor Coolant System upon demand. This will also prevent a water hammer following an initiation signal. One acceptable method of ensuring the line is full is to vent at the high points. The 31 day Frequency is based on the gradual nature of void buildup in the RCIC piping, the procedural controls governing system operation, and operating experience.

SR 3.5.3.2

Verifying the correct alignment for manual, power operated, and automatic valves (including the RCIC pump flow controller) in the RCIC flow path provides assurance that the proper flow path will exist for RCIC operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an initiation signal is allowed to be in a nonaccident position provided the valve will automatically reposition in the proper stroke time. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR does not apply to valves that

(continued)

BASES

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SURVEILLANCE      SR 3.5.3.5 (continued)  
REQUIREMENTS

This SR is modified by a Note that excludes vessel injection during the Surveillance. Since all active components are testable and full flow can be demonstrated by recirculation through the test line, coolant injection into the RPV is not required during the Surveillance.

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- REFERENCES
1. UFSAR, Section 5.4.6.
  2. Memorandum from R.L. Baer (NRC) to V. Stello, Jr. (NRC), "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.

Insert 2



BASES

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LCO  
(continued) ensure the primary containment pressure and temperature does not exceed design limits. Compliance with this LCO will ensure a primary containment configuration, including equipment hatches, that is structurally sound and that will limit leakage to those leakage rates assumed in the safety analyses.

Individual leakage rates specified for the primary containment air lock are addressed in LCO 3.6.1.2.

---

APPLICABILITY In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, primary containment is not required to be OPERABLE in MODES 4 and 5 to prevent leakage of radioactive material from primary containment.

---

ACTIONS

A.1

In the event primary containment is inoperable, primary containment must be restored to OPERABLE status within 1 hour. The 1 hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining primary containment OPERABILITY during MODES 1, 2, and 3. This time period also ensures that the probability of an accident (requiring primary containment OPERABILITY) occurring during periods where primary containment is inoperable is minimal.

~~B.1 and B.2~~

overall plant risk is minimized.

is

If primary containment 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 Insert 1 MODE 3 within 12 hours ~~and to MODE 4 within 36 hours.~~ is The allowed Completion Times ~~are~~ <sup>are</sup> reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

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(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.1.1.2 (continued)

fact that component failures that might have affected this test are identified by other primary containment SRs. Two consecutive test failures, however, would indicate unexpected primary containment degradation, in this event, the Note indicates, increasing the Frequency to once every 12 months is required until the situation is remedied as evidenced by passing two consecutive tests.

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REFERENCES

1. UFSAR, Section 6.2.1.
2. UFSAR, Section 15.6.5.
3. 10 CFR 50, Appendix J, Option B.

Insert 2



BASES

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ACTIONS  
(continued)

~~B.1 and B.2~~

If ~~two low set relief valves are inoperable or if the inoperable low set relief valve 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 12 hours ~~and to MODE 4 within 36 hours.~~ The allowed Completion Times ~~are~~ <sup>is</sup> reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

overall plant risk is minimized.

Insert 1

is

Insert 2

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.1.6.1

The actuator of each of the Electromatic low set relief valves (ERVs) is stroked to verify that the pilot valve strokes when manually actuated. For the ERVs, the actuator test is performed with the pilot valve actuator mounted in its normal position. This will allow testing of the manual actuation electrical circuitry, solenoid actuator, pilot operating lever, and pilot plunger. This test will verify pilot valve movement. However, since this test is performed prior to establishing the reactor pressure needed to overcome main valve closure spring force, the main valve will not stroke during the test.

This SR, together with the valve testing performed as required by the ASME Code for pressure relieving devices (ASME OM Code -1998 through 2000 Addenda), verify the capability of each relief valve to perform its function.

Valve testing will be performed at a steam test facility, where the valve (i.e., main valve and pilot valve) and an actuator representative of the actuator used at the plant will be installed on a steam header in the same orientation as the plant installation. The test conditions in the test facility will be similar to those in the plant installation, including ambient temperature, valve insulation, and steam conditions. The valve will then be leak tested, functionally tested to ensure the valve is capable of opening and closing (including stroke time), and leak tested a final time. Valve seat tightness will be verified by a cold bar test, and if not free of fog, leakage will be measured and verified to be below design limits. In addition, for the safety mode of S/RVs, an as-found setpoint

(continued)

BASES

SURVEILLANCE  
REQUIREMENTS

SR 3.6.1.6.1 (continued)

verification and as-found leak check are performed, followed by verification of set pressure, and delay. The valve will then be shipped to the plant without any disassembly or alteration of the main valve or pilot valve components.

The combination of the valve testing and the valve actuator testing provide a complete check of the capability of the valves to open and close, such that full functionality is demonstrated through overlapping tests, without cycling the valves.

3 The 24 month Frequency was based on the relief valve tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 2). The Frequency of 24 months ensures that each solenoid for each low set relief valve is tested. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.1.6.2

The low set relief designated relief valves are required to actuate automatically upon receipt of specific initiation signals. A system functional test is performed to verify that the mechanical portions (i.e., solenoids) of the low set relief function operate as designed when initiated either by an actual or simulated automatic initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in LCO 3.3.6.3, "Low Set Relief Valve Instrumentation," overlaps this SR to provide complete testing of the safety function.

The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by a Note that excludes valve actuation. This prevents a reactor pressure vessel pressure blowdown.

(continued)

BASES (continued)

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REFERENCES

Insert 3

1.

UFSAR, Section 6.2.1.3.4.2.

3

2.

ASME, Boiler and Pressure Vessel Code, Section XI.

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BASES

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ACTIONS C.1 (continued)

are not OPERABLE. Therefore, the inoperable vacuum breaker must be restored to OPERABLE status within 7 days. This is consistent with the Completion Time for Condition A and the fact that the leak tight primary containment boundary is being maintained.

Insert 1 →

~~E B.1~~

With two lines with one or more vacuum breakers inoperable for opening, the primary containment boundary is intact. However, in the event of a containment depressurization, the function of the vacuum breakers is lost. Therefore, all vacuum breakers in one line must be restored to OPERABLE status within 1 hour. This Completion Time is consistent with the ACTIONS of LCO 3.6.1.1, which requires that primary containment be restored to OPERABLE status within 1 hour.

~~F F  
E.1 and E.2~~

of Condition A, B, or E

If ~~any~~ Required Action and associated Completion time can not be met, 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 12 hours and to MODE 4 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.

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SURVEILLANCE REQUIREMENTS SR 3.6.1.7.1

Each vacuum breaker is verified to be closed to ensure that a potential breach in the primary containment boundary is not present. This Surveillance is performed by observing local or control room indications of vacuum breaker position. The 14 day Frequency is based on engineering judgment, is considered adequate in view of other indications of vacuum breaker status available to operations personnel, and has been shown to be acceptable through operating experience.

(continued)

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.1.7.1 (continued)

Two Notes are added to this SR. The first Note allows reactor-to-suppression chamber vacuum breakers opened in conjunction with the performance of a Surveillance to not be considered as failing this SR. These periods of opening vacuum breakers are controlled by plant procedures and do not represent inoperable vacuum breakers. The second Note is included to clarify that vacuum breakers open due to an actual differential pressure are not considered as failing this SR.

SR 3.6.1.7.2

Each vacuum breaker must be cycled to ensure that it opens properly to perform its design function and returns to its fully closed position. This ensures that the safety analysis assumptions are valid. The 92 day Frequency of this SR was developed based upon Inservice Testing Program requirements to perform valve testing at least once every 92 days.

SR 3.6.1.7.3

Demonstration of vacuum breaker opening setpoint is necessary to ensure that the safety analysis assumption regarding vacuum breaker full open differential pressure of  $\leq 0.5$  psid is valid. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. For this plant, the 24 month Frequency has been shown to be acceptable, based on operating experience, and is further justified because of other surveillances performed at shorter Frequencies that convey the proper functioning status of each vacuum breaker.

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REFERENCES

1. UFSAR, Sections 6.2.1.3.3 and 6.3.3.2.9.
2. UFSAR, Section 6.2.1.2.4.1.

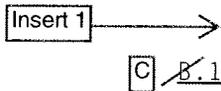
Insert 2 →

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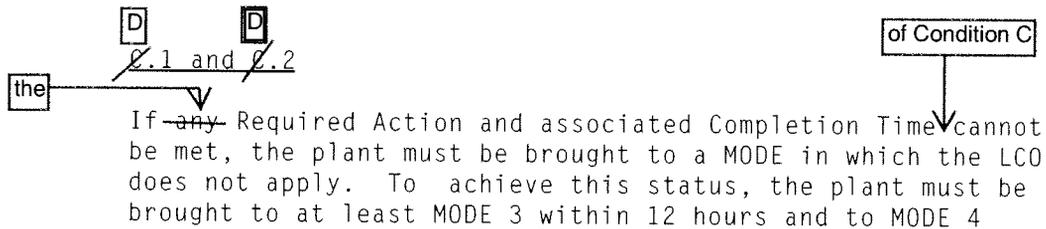
BASES

ACTIONS A.1 (continued)

would not function as designed during an event that depressurized the drywell), the remaining eight OPERABLE vacuum breakers are capable of providing the vacuum relief function. However, overall system reliability is reduced because additional failures in the remaining vacuum breakers could result in an excessive suppression chamber-to-drywell differential pressure during a DBA. Therefore, with one of the nine required vacuum breakers inoperable, 72 hours is allowed to restore at least one of the inoperable vacuum breakers to OPERABLE status so that plant conditions are consistent with the LCO requirements. The 72 hour Completion Time is considered acceptable due to the low probability of an event in which the remaining vacuum breaker capability would not be adequate.



With one vacuum breaker not closed, communication between the drywell and suppression chamber airspace exists, and, as a result, there is the potential for primary containment overpressurization due to this bypass leakage if a LOCA were to occur. Therefore, the open vacuum breaker must be closed. A short time is allowed to close the vacuum breaker due to the low probability of an event that would pressurize primary containment. If vacuum breaker position indication is not reliable, an alternate method of verifying that the vacuum breakers are closed is to verify that a differential pressure of 0.5 psid between the suppression chamber and drywell is maintained for 1 hour without makeup. The required 4 hour Completion Time is considered adequate to perform this test.



(continued)

BASES

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ACTIONS D ~~C.1~~ and D ~~C.2~~ (continued)

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.

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.1.8.1

Each vacuum breaker is verified closed to ensure that this potential large bypass leakage path is not present. This Surveillance is performed by observing the vacuum breaker position indication or by verifying that a differential pressure of 0.5 psid between the suppression chamber and drywell is maintained for 1 hour. The 14 day Frequency is based on engineering judgment, is considered adequate in view of other indications of vacuum breaker status available to operations personnel, and has been shown to be acceptable through operating experience.

Two Notes are added to this SR. The first Note allows suppression chamber-to-drywell vacuum breakers opened in conjunction with the performance of a Surveillance to not be considered as failing this SR. These periods of opening vacuum breakers are controlled by plant procedures and do not represent inoperable vacuum breakers. The second Note is included to clarify that vacuum breakers open due to an actual differential pressure are not considered as failing this SR.

SR 3.6.1.8.2

Each required vacuum breaker must be cycled to ensure that it opens adequately to perform its design function and returns to the fully closed position. This ensures that the safety analysis assumptions are valid. The 31 day Frequency of this SR was developed, based on Inservice Testing Program requirements to perform valve testing at least once every 92 days. A 31 day Frequency was chosen to provide additional assurance that the vacuum breakers are OPERABLE. In addition, this functional test is required within 12 hours after a discharge of steam to the suppression chamber from the relief valves.

(continued)

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.1.8.3

(continued)

Verification of the vacuum breaker opening setpoint from the closed position is necessary to ensure that the safety analysis assumption regarding vacuum breaker full open differential pressure of  $\leq 0.5$  psid is valid. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 24 month Frequency has been shown to be acceptable, based on operating experience, and is further justified because of other surveillances performed at shorter Frequencies that convey the proper functioning status of each vacuum breaker.

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REFERENCES

1. UFSAR, Section 6.2.1.2.4.1.
2. UFSAR, Table 6.2-1.

Insert 2



BASES

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APPLICABLE SAFETY ANALYSES (continued) primary containment conditions within design limits. The suppression pool temperature is calculated to remain below the design limit.

The RHR Suppression Pool Cooling System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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LCO During a DBA, a minimum of one RHR suppression pool cooling subsystem is required to maintain the primary containment peak pressure and temperature below design limits (Ref. 1). To ensure that these requirements are met, two RHR suppression pool cooling subsystems must be OPERABLE with power from two safety related independent power supplies. Therefore, in the event of an accident, at least one subsystem is OPERABLE assuming the worst case single active failure. An RHR suppression pool cooling subsystem is OPERABLE when one of the pumps, the heat exchanger, and associated piping, valves, instrumentation, and controls are OPERABLE.

---

APPLICABILITY In MODES 1, 2, and 3, a DBA could cause both a release of radioactive material to primary containment and a heatup and pressurization of primary containment. In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, the RHR Suppression Pool Cooling System is not required to be OPERABLE in MODE 4 or 5.

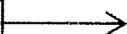
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ACTIONS

A.1

With one RHR suppression pool cooling subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this condition, the remaining OPERABLE RHR suppression pool cooling subsystem is adequate to perform the primary containment cooling function. However, the overall reliability is reduced because a single failure in the OPERABLE subsystem could result in reduced primary containment cooling capability. The 7 day Completion Time is acceptable in light of the redundant RHR suppression pool cooling capabilities afforded by the OPERABLE subsystem and the low probability of a DBA occurring during this period.

Insert 1



(continued)

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BASES

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ACTIONS  
(continued)

C ~~B.1~~

With two RHR suppression pool cooling subsystems inoperable, one subsystem must be restored to OPERABLE status within 8 hours. In this condition, there is a substantial loss of the primary containment pressure and temperature mitigation function. The 8 hour Completion Time is based on this loss of function and is considered acceptable due to the low probability of a DBA and the potential avoidance of a plant shutdown transient that could result in the need for the RHR suppression pool cooling subsystems to operate.

D ~~C.1~~ and D ~~C.2~~  
the

of Condition C

If ~~any~~ Required Action and associated Completion Time cannot be met, 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 12 hours and to MODE 4 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.

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.2.3.1

Verifying the correct alignment for manual and power operated valves in the RHR suppression pool cooling mode flow path provides assurance that the proper flow path exists for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the accident analysis. This is acceptable since the RHR suppression pool cooling mode is manually initiated. 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.

(continued)

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.2.3.1 (continued)

The Frequency of 31 days is justified because the valves are operated under procedural control, improper valve position would affect only a single subsystem, the probability of an event requiring initiation of the system is low, and the system is a manually initiated system. This Frequency has been shown to be acceptable based on operating experience.

SR 3.6.2.3.2

Verifying that each required RHR pump develops a flow rate  $\geq 5000$  gpm while operating in the suppression pool cooling mode with flow through the associated heat exchanger ensures that the primary containment peak pressure and temperature can be maintained below the design limits during a DBA (Ref. 1). The flow is a normal test of centrifugal pump performance required by ASME Code, Section XI (Ref. 2). This test confirms one point on the pump design curve, and the results are indicative of overall performance. Such inservice tests confirm component OPERABILITY, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

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REFERENCES

1. UFSAR, Section 6.2.

Insert 2 →  
3

2. ASME, Boiler and Pressure Vessel Code, Section XI.

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BASES

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ACTIONS

A.1 (continued)

However, the overall reliability is reduced because a single failure in the OPERABLE subsystem could result in reduced primary containment bypass mitigation capability. The 7 day Completion Time was chosen in light of the redundant RHR suppression pool spray capabilities afforded by the OPERABLE subsystem and the low probability of a DBA occurring during this period.

B.1

With both RHR suppression pool spray subsystems inoperable, at least one subsystem must be restored to OPERABLE status within 8 hours. In this condition, there is a substantial loss of the primary containment bypass leakage mitigation function. The 8 hour Completion Time is based on this loss of function and is considered acceptable due to the low probability of a DBA and because alternative methods to reduce pressure in the primary containment are available.

~~C.1 and C.2~~

If any Required Action and associated Completion Time cannot be met, the plant must be brought to a MODE in which the ~~TCO does not apply~~. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours, ~~and MODE 4 within 36 hours.~~ The allowed Completion Time ~~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.

overall plant risk is minimized.

Insert 1

is

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.2.4.1

Verifying the correct alignment for manual and power operated valves in the RHR suppression pool spray mode flow path provides assurance that the proper flow path exists for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position provided it can be aligned to the accident position within the time assumed in the

(continued)

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.2.4.1 (continued)

accident analysis. This is acceptable since the RHR suppression pool spray mode is manually initiated. 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.

The Frequency of 31 days is justified because the valves are operated under procedural control, improper valve position would affect only a single subsystem, the probability of an event requiring initiation of the system is low, and the system is a manually initiated system. This Frequency has been shown to be acceptable based on operating experience.

SR 3.6.2.4.2

This Surveillance is performed every 10 years to verify that the spray nozzles are not obstructed and that spray flow will be provided when required. The 10 year Frequency is adequate to detect degradation in performance due to the passive nozzle design and has been shown to be acceptable through operating experience.

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REFERENCES

1. UFSAR, Section 6.2.2.2.

← Insert 2

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BASES (continued)

ACTIONS

A.1

If secondary containment is inoperable, it must be restored to OPERABLE status within 4 hours. The 4 hour Completion Time provides a period of time to correct the problem that is commensurate with the importance of maintaining secondary containment during MODES 1, 2, and 3. This time period also ensures that the probability of an accident (requiring secondary containment OPERABILITY) occurring during periods where secondary containment is inoperable is minimal.

B.1 and B.2

overall plant risk is minimized.

If secondary containment 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 12 hours and to MODE 4 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.

Insert 1

C.1 and C.2

Movement of recently irradiated fuel assemblies in the secondary containment and OPDRVs can be postulated to cause significant fission product release to the secondary containment. In such cases, the secondary containment is the only barrier to release of fission products to the environment. Therefore, movement of recently irradiated fuel assemblies must be immediately suspended if the secondary containment is inoperable.

Suspension of this activity shall not preclude completing an action that involves moving a component to a safe position.

Also, action must be immediately initiated to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.

Required Action C.1 has been modified by a Note stating that LCO 3.0.3 is not applicable. If moving recently irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving recently irradiated fuel

(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.6.4.1.3 (continued)

addition to the requirements of LCO 3.6.4.3, either SGT subsystem will perform this test. The inoperability of the SGT System does not necessarily constitute a failure of this Surveillance relative to secondary containment OPERABILITY. Operating experience has shown the secondary containment boundary usually passes the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

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REFERENCES

1. UFSAR, Section 15.6.5.
2. UFSAR, Section 9.1.4.3.2.
3. NRC Safety Evaluation Report for the Holtec International HI-STORM 100 Storage System (Docket Number 72-1014, Certificate Number 1014, Amendment 2).

Insert 2



BASES

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LCO  
(continued) releases. Meeting the LCO requirements for two OPERABLE subsystems ensures operation of at least one SGT subsystem in the event of a single active failure. OPERABILITY of a subsystem also requires the associated cooling air damper remain OPERABLE.

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APPLICABILITY In MODES 1, 2, and 3, a DBA could lead to a fission product release to primary containment that leaks to secondary containment. Therefore, SGT System OPERABILITY is required during these MODES.

In MODES 4 and 5, the probability and consequences of these events are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining the SGT System in OPERABLE status is not required in MODE 4 or 5, except for other situations under which significant releases of radioactive material can be postulated, such as during operations with a potential for draining the reactor vessel (OPDRVs) or during movement of recently irradiated fuel assemblies in the secondary containment. Due to radioactive decay, the SGT System 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 24 hours).

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ACTIONS

A.1

With one SGT subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status in 7 days. In this condition, the remaining OPERABLE SGT subsystem is adequate to perform the required radioactivity release control function. However, the overall system reliability is reduced because a single failure in the OPERABLE subsystem could result in the radioactivity release control function not being adequately performed. The 7 day Completion Time is based on consideration of such factors as the availability of the OPERABLE redundant SGT System and the low probability of a DBA occurring during this period.

B.1 and B.2

If the SGT subsystem cannot be restored to OPERABLE status within the required Completion Time in MODE 1, 2, or 3, 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 12 hours ~~and to MODE 4 within~~

overall plant risk is minimized.

(continued)

BASES

ACTIONS

~~B.1 and B.2~~ (continued)

Insert 1

~~36 hours.~~ The allowed Completion Times <sup>is</sup> 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.

C.1, C.2.1, and C.2.2

During movement of recently irradiated fuel assemblies, in the secondary containment or during OPDRVs, when Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE SGT subsystem should immediately be placed in operation. This action ensures that the remaining subsystem is OPERABLE, that no failures that could prevent automatic actuation will occur, and that any other failure would be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that represent a potential for releasing a significant amount of radioactive material to the secondary containment, thus placing the plant in a condition that minimizes risk. If applicable, movement of recently irradiated fuel assemblies must immediately be suspended. Suspension of this activity must not preclude completion of movement of a component to a safe position. Also, if applicable, actions must immediately be initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.

The Required Actions of Condition C have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving recently irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving recently irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of recently irradiated fuel assemblies would not be a sufficient reason to require a reactor shutdown.

D.1

If both SGTS subsystems are inoperable in MODE 1, 2, or 3, the SGT system may not be capable of supporting the required correct the problem that is commensurate with the importance

(continued)

BASES

ACTIONS

D.1 (continued)

of supporting the required radioactivity release control radioactivity release control function. Therefore, one SGT subsystem must be restored to OPERABLE status within 1 hour.

The 1 hour Completion Time provides a period of time to function in MODES 1, 2, and 3. This time period also ensures that the probability of an accident (requiring the SGT System) occurring during periods where the required radioactivity release control function may not be maintained is minimal.

~~E.1 and E.2~~

If one SGT subsystem cannot be restored to OPERABLE status within the required Completion Time in MODE 1, 2, or 3, 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 12 hours and to MODE 4 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.

overall plant risk is minimized.

Insert 2

is

F.1 and F.2

When two SGT subsystems are inoperable, if applicable, movement of recently irradiated fuel assemblies in secondary containment must immediately be suspended. Suspension of this activity shall not preclude completion of movement of a component to a safe position. Also, if applicable, action must immediately be initiated to suspend OPDRVs in order to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until OPDRVs are suspended.

Required Action F.1 has been modified by a Note stating that LCO 3.0.3 is not applicable. If moving recently irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving recently irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of recently irradiated fuel assemblies would not be a sufficient reason to require a reactor shutdown.

(continued)

BASES (continued)

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- REFERENCES
1. UFSAR, Section 3.1.9.1.
  2. UFSAR, Section 6.5.1.1.
  3. UFSAR, Section 15.6.2.
  4. UFSAR, Section 15.6.5.
  5. Regulatory Guide 1.52, Rev. 2. |
  6. UFSAR, Section 9.1.4.3.2. |
  7. NRC Safety Evaluation Report for the Holtec  
International HI-STORM 100 Storage System (Docket  
Number 72-1014, Certificate Number 1014, Amendment 2). |

Insert 3 →

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BASES

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ACTIONS

A.1 (continued)

failure in the OPERABLE subsystem could result in reduced RHRSW capability. The 30 day Completion Time is based on the remaining RHRSW heat removal capability and the low probability of a DBA with concurrent worst case single failure.

B.1

With one RHRSW pump inoperable in each subsystem, the remaining OPERABLE pump in each subsystem can provide adequate heat removal capacity following a design basis LOCA with concurrent worst case single failure. One inoperable pump is required to be restored to OPERABLE status within 7 days. The 7 day Completion Time for restoring one inoperable RHRSW pump to OPERABLE status is based on engineering judgment, considering the level of redundancy provided and low probability of an event occurring requiring RHRSW during this time period.

C.1

Required Action C.1 is intended to handle the inoperability of one RHRSW subsystem for reasons other than Condition A. The Completion Time of 7 days is allowed to restore the RHRSW subsystem to OPERABLE status. With the unit in this condition, the remaining OPERABLE RHRSW subsystem is adequate to perform the RHRSW heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE RHRSW subsystem could result in loss of RHRSW function. The Completion Time is based on the redundant RHRSW capabilities afforded by the OPERABLE subsystem and the low probability of an event occurring requiring RHRSW during this period.

The Required Action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7, be entered and Required Actions taken if the inoperable RHRSW subsystem results in an inoperable RHR shutdown cooling subsystem. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

Insert 1 →

(continued)

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BASES

ACTIONS  
(continued)

**E** ~~3.1~~

With both RHR SW subsystems inoperable for reasons other than Condition B (e.g., both subsystems with inoperable flow paths, or one subsystem with an inoperable pump and one subsystem with an inoperable flow path), the RHR SW System is not capable of performing its intended function. At least one subsystem must be restored to OPERABLE status within 8 hours. The 8 hour Completion Time for restoring one RHR SW subsystem to OPERABLE status, is based on the Completion Times provided for the RHR suppression pool cooling and spray functions.

The Required Action is modified by a Note indicating that the applicable Conditions of LCO 3.4.7, be entered and Required Actions taken if an inoperable RHR SW subsystem results in an inoperable RHR shutdown cooling subsystem. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

**F** ~~3.1 and 3.2~~ **F** **E** **is**

the

If ~~any~~ Required Action and associated Completion Time of Conditions ~~A, B, C, or D~~ are not met, 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 12 hours and in MODE 4 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.

SURVEILLANCE  
REQUIREMENTS

SR 3.7.1.1

Verifying the correct alignment for each manual and power operated valve in each RHR SW subsystem flow path provides assurance that the proper flow paths will exist for RHR SW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. A valve is also allowed to be in the nonaccident position, and yet

(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.7.1.1 (continued)

considered in the correct position, provided it can be realigned to its accident position. This is acceptable because the RHRWS System is a manually initiated system.

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.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

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REFERENCES

1. UFSAR, Section 9.2.1.
2. UFSAR, Section 9.2.5.
3. UFSAR, Section 6.2.
4. UFSAR, Section 6.2.1.3.3.

Insert 2 →

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BASES

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BACKGROUND  
(continued)

The CREV System is designed to maintain the control room emergency zone environment for a 30 day continuous occupancy after a DBA without exceeding 5 rem whole body dose or its equivalent to any part of the body. The CREV System will pressurize the control room emergency zone to about 0.125 inches water gauge to minimize infiltration of air from adjacent zones. CREV System operation in maintaining control room habitability is discussed in the UFSAR, Sections 6.4, 9.4, and 15.6.5 (Refs. 1, 2, and 3, respectively).

Movement of a Spent Fuel Cask containing Spent Nuclear Fuel in a sealed Multi-Purpose Canister (MPC) and using a single failure-proof crane is not considered to be "movement of irradiated fuel assemblies in secondary containment" (Refs.

4 and 5 ~~5 and 6~~).

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APPLICABLE  
SAFETY ANALYSES

The ability of the CREV System to maintain the habitability of the control room emergency zone is an explicit assumption for the safety analyses presented in the UFSAR, Sections 6.4 and 15.6.5 (Refs. 1 and 3, respectively). The isolation of the control room emergency zone is assumed to operate following a loss of coolant accident, fuel handling accident, main steam line break, and control rod drop accident, as discussed in the UFSAR, Section 6.4 (Ref. 1). The radiological doses to control room personnel as a result of the various DBAs are summarized in Reference 3.

The CREV System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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LCO

The CREV System is required to be OPERABLE. Total system failure could result in exceeding a dose of 5 rem to the control room operators in the event of a DBA.

The CREV System is considered OPERABLE when the individual components necessary to control operator exposure are OPERABLE. The system is considered OPERABLE when its associated:

- a. AFU is OPERABLE,
- b. Train B air handling unit (fan portion only) is OPERABLE, including the ductwork, to maintain air circulation to and from the control room emergency

(continued)

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BASES

ACTIONS  
(continued)

B.1 and B.2

In MODE 1, 2, or 3, if the inoperable CREV System cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE that minimizes risk. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 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.

is

overall plant

Insert 1

C.1, C.2, and C.3

LCO 3.0.3 is not applicable while in MODE 4 or 5. However, since irradiated fuel movement can occur in MODE 1, 2, or 3, the Required Actions of Condition C are modified by a Note indicating that LCO 3.0.3 does not apply. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Entering LCO 3.0.3 while in MODE 1, 2, or 3 would require the unit to be shutdown, but would not require immediate suspension of movement of irradiated fuel assemblies. The NOTE to the ACTIONS, "LCO 3.0.3 is not applicable," ensures that the actions for immediate suspension of irradiated fuel assembly movement are not postponed due to entry into LCO 3.0.3.

With the CREV System inoperable, during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs, action must be taken immediately to suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk.

If applicable, CORE ALTERATIONS and movement of irradiated fuel assemblies in the secondary containment must be suspended immediately. Suspension of these activities shall not preclude completion of movement of a component to a safe position. Also, if applicable, action must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Action must continue until the OPDRVs are suspended.

(continued)

BASES (continued)

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SURVEILLANCE  
REQUIREMENTS

SR 3.7.4.1

This SR verifies that the CREV System in a standby mode starts from the control room and continues to operate. This SR includes initiating flow through the HEPA filters and charcoal adsorbers. Standby systems should be checked periodically to ensure that they start and function properly. As the environmental and normal operating conditions of this system are not severe, testing the system once every month provides an adequate check on this system. Monthly heater operation for  $\geq 10$  continuous hours, during system operation dries out any moisture that has accumulated in the charcoal as a result of humidity in the ambient air. Furthermore, the 31 day Frequency is based on the known reliability of the equipment.

SR 3.7.4.2

This SR verifies that the required CREV testing is performed in accordance with Specification 5.5.7, "Ventilation Filter Testing Program (VFTP)." The CREV filter tests are in accordance with Regulatory Guide 1.52 (Ref. ~~4~~). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, system flow rate, and the physical properties of the activated charcoal (general use and following specific operations). Specific test frequencies and additional information are discussed in detail in the VFTP.

6

SR 3.7.4.3

This SR verifies that on an actual or simulated initiation signal, the CREV System isolation dampers close. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.7.1.6 overlaps this SR to provide complete testing of the safety function. Operating experience has shown that these components normally pass the SR when performed at the 24 month Frequency. Therefore, the Frequency was found to be acceptable from a reliability standpoint.

(continued)

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.7.4.4

(continued)

This SR verifies the integrity of the control room emergency zone and the assumed inleakage rates of potentially contaminated air. The control room emergency zone positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper function of the CREV System. During the emergency pressurization mode of operation, the CREV System is designed to slightly pressurize the control room emergency zone  $\geq 0.125$  inches water gauge positive pressure with respect to the adjacent areas to minimize unfiltered inleakage. The CREV System is designed to maintain this positive pressure at a flow rate of  $\leq 2000$  scfm to the control room emergency zone in the pressurization mode. The Frequency of 24 months is consistent with industry practice and other filtration systems SRs.

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REFERENCES

1. UFSAR, Section 6.4.
2. UFSAR, Section 9.4.
3. UFSAR, Section 15.6.5.

~~4. Regulatory Guide 1.52, Revision 2, March 1978.~~

4 ~~5.~~ UFSAR, Section 9.1.4.3.2.

5 ~~6.~~ NRC Safety Evaluation Report for the Holtec International HI-STORM 100 Storage System (Docket Number 72-1014, Certificate Number 1014, Amendment 2).

Insert 2  $\longrightarrow$

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BASES

APPLICABILITY  
(continued)

emergency zone temperature will not exceed equipment OPERABILITY limits following control room emergency zone isolation.

In MODES 4 and 5, the probability and consequences of a Design Basis Accident are reduced due to the pressure and temperature limitations in these MODES. Therefore, maintaining the Control Room Emergency Ventilation AC System OPERABLE is not required in MODE 4 or 5, except for the following situations under which significant radioactive releases can be postulated:

- a. During movement of recently irradiated fuel assemblies in the secondary containment; and
- b. During operations with a potential for draining the reactor vessel (OPDRVs).

Due to radioactive decay, the Control Room Emergency Ventilation AC System 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 24 hours).

ACTIONS

A.1

With the Control Room Emergency Ventilation AC System inoperable in MODE 1, 2, or 3, the system must be restored to OPERABLE status within 30 days. The 30 day Completion Time is based on the low probability of an event occurring requiring control room emergency zone isolation and the availability of alternate nonsafety cooling methods.

~~B.1 and B.2~~

In MODE 1, 2, or 3, if the inoperable Control Room Emergency Ventilation AC System cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE that minimizes risk. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 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.

overall plant

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Insert 1

(continued)

BASES (continued)

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- REFERENCES
1. UFSAR, Section 6.4.
  2. UFSAR, Section 9.1.4.3.2.
  3. NRC Safety Evaluation Report for the Holtec International HI-STORM 100 Storage System (Docket Number 72-1014, Certificate Number 1014, Amendment 2).

Insert 2 →

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BASES (continued)

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APPLICABILITY The LCO is applicable when steam is being exhausted to the main condenser and the resulting noncondensibles are being processed via the Main Condenser Offgas System. This occurs during MODE 1, and during MODES 2 and 3 with any main steam line not isolated and the SJAE in operation. In MODES 4 and 5, main steam is not being exhausted to the main condenser and the requirements are not applicable.

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ACTIONS

A.1

If the offgas radioactivity rate limit is exceeded, 72 hours is allowed to restore the gross gamma activity rate to within the limit. The 72 hour Completion Time is reasonable, based on engineering judgment, the time required to complete the Required Action, the large margins associated with permissible dose and exposure limits, and the low probability of a Main Condenser Offgas System rupture.

and  
B.1, B.2, B.3.1, and B.3.2

If the gross gamma activity rate is not restored to within the limits in the associated Completion Time, all main steam lines or the SJAE must be isolated. This isolates the Main Condenser Offgas System from significant sources of radioactive steam. The main steam lines are considered isolated if at least one main steam isolation valve in each main steam line is closed, and at least one main steam line drain valve in each drain line is closed. The 12 hour Completion Time is reasonable, based on operating experience, to perform the actions from full power conditions in an orderly manner and without challenging unit systems.

An alternative to Required Actions B.1 and B.2 is to place the unit 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 12 hours and in MODE 4 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.

overall plant risk is minimized.

is Insert 1

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(continued)

BASES (continued)

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SURVEILLANCE  
REQUIREMENTS

SR 3.7.6.1

This SR, on a 31 day Frequency, requires an isotopic analysis of a representative offgas sample (taken at the recombiner outlet or the SJAE outlet if the recombiner is bypassed) to ensure that the required limits are satisfied. The noble gases to be sampled are Xe-133, Xe-135, Xe-138, Kr-85M, Kr-87, and Kr-88. If the measured rate of radioactivity increases significantly as indicated by the radiation monitors located prior to the offgas holdup line (by  $\geq 50\%$  after correcting for expected increases due to changes in THERMAL POWER), an isotopic analysis is also performed within 4 hours after the increase is noted, to ensure that the increase is not indicative of a sustained increase in the radioactivity rate. The 31 day Frequency is adequate in view of other instrumentation that continuously monitor the offgas, and is acceptable, based on operating experience.

This SR is modified by a Note indicating that the SR is not required to be performed until 31 days after any main steam line is not isolated and the SJAE is in operation. Only in this condition can radioactive fission gases be in the Main Condenser Offgas System at significant rates.

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REFERENCES

1. Letter E-DAS-023-00 from D. A. Studley (Sciencetech-NUS) to R. Tsai (ComEd), dated January 24, 2000.
2. 10 CFR 50.67.

Insert 2 

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BASES

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ACTIONS D.1 and D.2 (continued)

capability of the remaining AC sources, reasonable time for repairs, and the low probability of a DBA occurring during this period.

E.1

With two required DGs inoperable, there is no more than one remaining standby AC source. Thus, with an assumed loss of offsite electrical power, sufficient standby AC sources may not be available to power the minimum required ESF functions. Since the offsite electrical power system is the only source of AC power for the majority of ESF equipment at 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 unit 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 Regulatory Guide 1.93 (Ref. 8), with both DGs inoperable, operation may continue for a period that should not exceed 2 hours. The Completion Time assumes complete loss of onsite (DG) AC capability to power the minimum loads needed to respond to analyzed events.

~~F.1 and F.2~~

If the inoperable AC electrical power sources cannot be restored to OPERABLE status within the associated Completion Time, the unit must be brought to a MODE in which the ~~LC0~~ does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours ~~and to MODE 4 within 36 hours.~~ The allowed Completion Times are ← is

reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

overall plant risk is minimized.

Insert 1

(continued)

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BASES

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ACTIONS  
(continued)

G.1

Condition G corresponds to a level of degradation in which all redundancy in the 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.

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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 UFSAR, Section 8.3.1.6.5 (Ref. ~~V8~~). 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 consistent with the recommendations of Regulatory Guide 1.9 (Ref. ~~V10~~), Regulatory Guide 1.108 (Ref. ~~V11~~), and Regulatory Guide 1.137 (Ref. ~~V12~~), as addressed in the UFSAR.

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The Surveillances are modified by two Notes to clearly identify how the Surveillances apply to the given unit and the opposite unit AC electrical power sources. Note 1 states that SR 3.8.1.1 through 3.8.1.20 are applicable only to the given unit AC electrical power sources and Note 2 states that SR 3.8.1.21 is applicable to the opposite unit AC electrical power sources. These Notes are necessary since the opposite unit AC electrical power sources are not required to meet all of the requirements of the given unit AC electrical power sources (e.g., the opposite unit's DG is not required to start on the opposite unit's ECCS initiation signal to support the OPERABILITY of the given unit).

Where the SRs discussed herein specify voltage and frequency tolerances, the following summary is applicable. The minimum steady state output voltage of 3952 V is approximately 95% of the nominal 4160 V output voltage. This value, which is specified in ANSI C84.1 (Ref. ~~V13~~), 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

14

(continued)

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BASES

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SURVEILLANCE  
REQUIREMENTS  
(continued)

operating voltage is also usually specified as 90% of name plate rating. The specified maximum steady state output voltage of 4368 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  $\pm 2\%$  of the 60 Hz nominal frequency and are derived from the recommendations found in Regulatory Guide 1.9 (Ref. ~~10~~).



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 7 day Frequency is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room.

SR 3.8.1.2 and SR 3.8.1.8

These SRs help to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and 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 have been modified by a Note (Note 1 for SR 3.8.1.2 and Note 1 for SR 3.8.1.8) to indicate that all DG starts for these Surveillances may be preceded by an engine prelube period and followed by a warmup prior to loading.

For the purposes of this testing, the DGs are started from standby conditions. 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.

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.8 (continued)

In order to reduce stress and wear on diesel engines, the manufacturer has recommended 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 2 of SR 3.8.1.2.

SR 3.8.1.8 requires that, at a 184 day Frequency, the DG starts from standby conditions and achieves required voltage and frequency within 13 seconds. The 13 second start requirement supports the assumptions in the design basis LOCA analysis of UFSAR, Section 6.3 (Ref. ~~V14~~). The 13 second start requirement is not applicable to SR 3.8.1.2 (see Note 2 of SR 3.8.1.2), when a modified start procedure as described above is used. If a modified start is not used, the 13 second start requirement of SR 3.8.1.8 applies. 15

Since SR 3.8.1.8 does require a 13 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.

In addition, the DG is required to maintain proper voltage and frequency limits after steady state is achieved. The voltage and frequency limits are normally achieved within 13 seconds. The time for the DG to reach steady state operation, unless the modified DG start method is employed, is periodically monitored and the trend evaluated to identify degradation of governor and voltage regulator performance.

To minimize testing of the common DG, Note 3 of SR 3.8.1.2 and Note 2 of SR 3.8.1.8 allow a single test of the common DG (instead of two tests, one for each unit) to satisfy the requirements for both units. This is allowed since the main purpose of the Surveillance can be met by performing the test on either unit. However, to the extent practicable, the tests should be alternated between units. If the DG fails one of these Surveillances, the DG should be considered inoperable on both units, unless the cause of the failure can be directly related to only one unit.

11 The 31 day Frequency for SR 3.8.1.2 is consistent with Regulatory Guide 1.9 (Ref. ~~V10~~). The 184 day Frequency for

(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.2 and SR 3.8.1.8 (continued)

SR 3.8.1.8 is a reduction in cold testing consistent with Generic Letter 84-15 (Ref. 7). These Frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.

SR 3.8.1.3

This Surveillance verifies that the DGs are capable of synchronizing and accepting a load approximately equivalent to that corresponding to the continuous rating. 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 when running synchronized with the grid. The 0.8 power factor value is the design rating of the machine at a particular kVA. The 1.0 power factor value is an operational condition where the reactive power component is zero, which minimizes the reactive heating of the generator. Operating the generator at a power factor between 0.8 lagging and 1.0 avoids adverse conditions associated with underexciting the generator and more closely represents the generator operating requirements when performing its safety function (running isolated on its associated 4160 V ESS bus). 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 31 day Frequency for this Surveillance is consistent with Regulatory Guide 1.9 (Ref. ~~V10~~). 11

Note 1 modifies this Surveillance to indicate 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.

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.4 (continued)

provided and facility operators would be aware of any large uses of fuel oil during this period.

SR 3.8.1.5 and SR 3.8.1.7

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 tank once every 31 days eliminates the necessary environment for bacterial survival. This is accomplished by draining a portion of the contents from the bottom of the day tank to the top of the storage tank. Checking for and removal of any accumulated water from the bulk storage tank once every 92 days also 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 provides data regarding the watertight integrity of the fuel oil system. The Surveillance Frequencies are established by Regulatory Guide 1.137 (Ref. ~~V12~~). This SR is for preventive maintenance. The presence of water does not necessarily represent a failure of this SR provided that accumulated water is removed during performance of this Surveillance.

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SR 3.8.1.6

This Surveillance demonstrates that each fuel oil transfer pump operates and automatically transfers fuel oil from its associated storage tank to its associated day tank. It is required to support continuous operation of standby power sources. This Surveillance provides assurance that each

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BASES

SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.10 (continued)

a residual heat removal service water pump (722 kW). The specified load value conservatively bounds the expected kW rating of the single largest loads under accident conditions. 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;
- b. Tripping its associated single largest post-accident load with the DG solely supplying the bus.

Consistent with Regulatory Guide 1.9 (Ref. ~~10~~), the load rejection test is acceptable if the diesel speed does not exceed the nominal (synchronous) speed plus 75% of the difference between nominal speed and the overspeed trip setpoint, or 115% of nominal speed, whichever is lower. This corresponds to 66.73 Hz, which is the nominal speed plus 75% of the difference between nominal speed and the overspeed trip setpoint.

The time, voltage, and frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. ~~10~~) recommendations for response during load sequence intervals. The 3 seconds specified in SR 3.8.1.10.b is equal to 60% of the 5 second load sequence interval associated with sequencing the ECCS low pressure pumps during an undervoltage on the bus concurrent with a LOCA. The 4 seconds specified in SR 3.8.1.10.c is equal to 80% of the 5 second load sequence interval associated with sequencing the ECCS low pressure pumps during an undervoltage on the bus concurrent with a LOCA. The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.10.a corresponds to the maximum frequency excursion, while SR 3.8.1.10.b and SR 3.8.1.10.c are steady state voltage and frequency values to which the system must recover following load rejection. The 24 month Frequency takes into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.10 (continued)

This SR is modified by a Note. The reason for the Note is to minimize testing of the common DG and allow a single test of the common DG (instead of two tests, one for each unit) to satisfy the requirements for both units. This is allowed since the main purpose of the Surveillance can be met by performing the test on either unit. If the DG fails one of these Surveillances, the DG should be considered inoperable on both units, unless the cause of the failure can be directly related to only one unit.

SR 3.8.1.11

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Consistent with Regulatory Guide 1.9 (Ref. ~~10~~), paragraph C.2.2.8, 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 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.

In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, a load band (90% to 100%) has been specified based on Regulatory Guide 1.9 (Ref. ~~10~~). 11

The 24 month Frequency takes into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

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BASES

SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.11 (continued)

This SR is modified by two Notes. To minimize testing of the common DG, Note 1 allows a single test of the common DG (instead of two tests, one for each unit) to satisfy the requirements for both units. This is allowed since the main purpose of the Surveillance can be met by performing the test on either unit. If the DG fails one of these Surveillances, the DG should be considered inoperable on both units, unless the cause of the failure can be directly related to only one unit. Note 2 modifies this Surveillance by stating that momentary transients outside the voltage limit do not invalidate this test.

SR 3.8.1.12



Consistent with Regulatory Guide 1.9 (Ref. ~~10~~), paragraph C.2.2.4, 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.

15

The DG auto-start and energization of permanently connected loads time of 13 seconds is derived from requirements of the accident analysis for responding to a design basis large break LOCA (Ref. ~~V14~~). The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved.

The requirement to verify the connection and power supply of permanently connected 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, a component or system may be out-of-service and closure of its

(continued)

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.12 (continued)

associated breaker during this test may damage the component or system. In lieu of actual demonstration of the connection and loading of these 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 Frequency of 24 months takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

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 shall be started from standby conditions, that is, with the engine coolant and oil being continuously circulated and temperature maintained consistent with manufacturer recommendations.

SR 3.8.1.13

11



Consistent with Regulatory Guide 1.9 (Ref. ~~10~~), paragraph C.2.2.5, this Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time (13 seconds) from the design basis actuation signal (LOCA signal). In addition, the DG is required to maintain proper voltage and frequency limits after steady state is achieved. The time for the DG to reach the steady state voltage and frequency limits is periodically monitored and the trend evaluated to identify degradation of governor and voltage regulator performance. The DG is required to operate for  $\geq 5$  minutes. The 5 minute period provides sufficient time to demonstrate stability.

The Frequency of 24 months takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with the expected fuel cycle lengths.

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.13 (continued)

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 being continuously circulated and temperature maintained consistent with manufacturer recommendations.

SR 3.8.1.14



Consistent with Regulatory Guide 1.9 (Ref. ~~10~~) paragraph C.2.2.12, this Surveillance demonstrates that DG non-critical protective functions (e.g., high jacket water temperature) are bypassed on an ECCS initiation test signal and critical protective functions (engine overspeed and generator differential current) trip the DG to avert substantial damage to the DG unit. The non-critical 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.

The 24 month Frequency is based on engineering judgment, takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

SR 3.8.1.15



Regulatory Guide 1.9 (Ref. ~~10~~), paragraph C.2.2.9, requires demonstration that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, 22 hours of which is at a load equivalent to 90% to 100% of the continuous rating of the DG and 2 hours of which is at a load equivalent to 105% to 110% of the continuous rating of the DG. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelube 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.

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BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.15 (continued)

purpose of the Surveillance can be met by performing the test on either unit. If the DG fails one of these Surveillances, the DG should be considered inoperable on both units, unless the cause of the failure can be directly related to only one unit.

SR 3.8.1.16

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 13 seconds. The 13 second time is derived from the requirements of the accident analysis for responding to a design basis large break LOCA (Ref. ~~V14~~). In addition, the DG is required to maintain proper voltage and frequency limits after steady state is achieved. The time for the DG to reach the steady state voltage and frequency limits is periodically monitored and the trend evaluated to identify degradation of governor and voltage regulator performance.

15

The 24 month Frequency takes into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with the expected fuel cycle lengths.

This SR is modified by three Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The requirement that the diesel has operated for at least 2 hours at approximately full load conditions prior to performance of this Surveillance is based on 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. To minimize testing of the common DG, Note 3 allows a single test of the common DG (instead of two tests, one for each unit) to satisfy the requirements for both units. This is allowed since the main purpose of

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.16 (continued)

the Surveillance can be met by performing the test on either unit. If the DG fails one of these Surveillances, the DG should be considered inoperable on both units, unless the cause of the failure can be directly related to only one unit.

SR 3.8.1.17

11



Consistent with Regulatory Guide 1.9 (Ref. ~~10~~), paragraph C.2.2.11, this Surveillance ensures that the manual synchronization and load transfer from the DG to the offsite source can be made and that the DG can be returned to ready-to-load status when offsite power is restored. It also ensures that the auto-start logic is reset to allow the DG to reload if a subsequent loss of offsite power occurs. The DG is considered to be in ready-to-load status when the DG is at rated speed and voltage, the output breaker is open and can receive an auto-close signal on bus undervoltage, and the individual load timers are reset.

The Frequency of 24 months takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

SR 3.8.1.18

Under accident conditions with loss of offsite power loads are sequentially connected to the bus by the automatic load sequence time delay relays. 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 -10% load sequence time interval limit ensures that a sufficient time interval exists for the DG to restore frequency and voltage prior to applying the next load. There is no upper limit for the load sequence time interval since, for a single load interval (i.e., the time between two load blocks), the capability of the DG to restore frequency and voltage prior to applying the second load is not negatively affected by a longer than designed load interval, and if there are additional load blocks (i.e., the design includes multiple load intervals), then

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.18 (continued)

the lower limit requirements (-10%) will ensure that sufficient time exists for the DG to restore frequency and voltage prior to applying the remaining load blocks (i.e., all load intervals must be  $\geq 90\%$  of the design interval). Reference V14 provides a summary of the automatic loading of ESS buses.

15

The Frequency of 24 months takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

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 DG operation, as discussed in the Bases for SR 3.8.1.12, during a loss of offsite power actuation test signal in conjunction with an ECCS initiation 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 Frequency of 24 months takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

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 being continuously circulated and temperature maintained consistent with manufacturer recommendations.

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BASES

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SURVEILLANCE  
REQUIREMENTS

(continued)

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 frequency and voltage within the specified time when the DGs are started simultaneously.

The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. ~~V10~~).

11

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.

SR 3.8.1.21

With the exception of this Surveillance, all other Surveillances of this Specification (SR 3.8.1.1 through SR 3.8.1.20) are applied only to the given unit AC sources. This Surveillance is provided to direct that appropriate Surveillances for the required opposite unit AC sources are governed by the applicable opposite unit Technical Specifications. Performance of the applicable opposite unit Surveillances will satisfy the opposite unit requirements, as well as satisfying the given unit Surveillance Requirement. Exceptions are noted to the opposite unit SRs of LCO 3.8.1. SR 3.8.1.9 and SR 3.8.1.20 are excepted since only one opposite unit offsite circuit and DG is required by the given unit's Specification. SR 3.8.1.13, SR 3.8.1.18, and SR 3.8.1.19 are excepted since these SRs test the opposite unit's ECCS initiation signal, which is not needed for the AC electrical power sources to be OPERABLE on the given unit.

The Frequency required by the applicable opposite unit SR also governs performance of that SR for the given unit.

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.1.21 (continued)

As Noted, if the opposite unit is in MODE 4 or 5, or moving recently irradiated fuel assemblies in the secondary containment, SR 3.8.1.3, SR 3.8.1.10 through SR 3.8.1.12, and SR 3.8.1.14 through SR 3.8.1.17 are not required to be performed. This ensures that a given unit SR will not require an opposite unit SR to be performed, when the opposite unit Technical Specifications exempts performance of an opposite unit SR (however, as stated in the opposite unit SR 3.8.2.1 Note 1, while performance of an SR is exempted, the SR must still be met).

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REFERENCES

1. UFSAR, Section 3.1.7.3.
  2. UFSAR, Section 8.2.
  3. UFSAR, Section 8.3.1.6.4.
  4. Safety Guide 9.
  5. UFSAR, Chapter 6.
  6. UFSAR, Chapter 15.
  7. Generic Letter 84-15, July 2, 1984.
  8. Regulatory Guide 1.93, Revision 0, December 1974.
  -  ~~10.~~ UFSAR, Section 8.3.1.6.5.
  - ~~11.~~ 10. Regulatory Guide 1.9, Revision 3, July 1993.
  - ~~12.~~ 11. Regulatory Guide 1.108, Revision 1, August 1977.
  - ~~13.~~ 12. Regulatory Guide 1.137, Revision 1, October 1979.
  - ~~14.~~ 13. ANSI C84.1, 1982.
  - ~~15.~~ 14. UFSAR, Section 6.3.
  - ~~16.~~ 15. IEEE Standard 308, 1980.
-

BASES

ACTIONS  
(continued)

~~F.1 and F.2~~

overall plant risk  
is minimized

If the DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, 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 12 hours and to MODE 4 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. The Completion Time to bring the unit to MODE 4 is consistent with the time required in Regulatory Guide 1.93 (Ref. 6).

Insert 1

is

SURVEILLANCE  
REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. The 7 day Frequency is conservative when compared with manufacturers recommendations and IEEE-450 (Ref. 7).

8

SR 3.8.4.2

Visual inspection to detect corrosion of the battery cells and connections, or measurement of the resistance of each intercell and terminal connection, provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance.

The connection resistance limits established for this SR are within the values established by industry practice. The connection resistance limits of this SR are related to the resistance of individual bolted connections and do not include the resistance of conductive components (e.g., cables or conductors located between cells, racks, or tiers).

(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.4.4 and SR 3.8.4.5 (continued)

The connection resistance limits established for this SR are within the values established by industry practice. The connection resistance limits of this SR are related to the resistance of individual bolted connections and do not include the resistance of conductive components (e.g., cables or conductors located between cells, racks, or tiers).

The 24 month Frequency for the Surveillance is based on engineering judgement. Operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.8.4.6

9

Battery charger capability requirements are based on the design capacity of the chargers (Ref. 1). According to Regulatory Guide 1.32 (Ref. ~~18~~), the battery charger supply is required to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

The Frequency is acceptable given the administrative controls existing to ensure adequate charger performance during these 24 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

SR 3.8.4.7

A battery service test is a special test of the battery's capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The test can be performed using simulated or actual loads. The discharge rate and test length corresponds to the design duty cycle requirements as specified in Reference 1.

(continued)

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BASES

SURVEILLANCE  
REQUIREMENTS

SR 3.8.4.8 (continued)

A modified performance discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle). This will often confirm the battery's ability to meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a service test when the modified performance discharge test is performed in lieu of the service test. Either the battery performance discharge test or the modified performance discharge test is acceptable for satisfying SR 3.8.4.8; however, only the modified performance discharge test may be used to satisfy SR 3.8.4.8 while satisfying the requirements of SR 3.8.4.7 at the same time.

For the 125 VDC battery, the acceptance criteria for this Surveillance is consistent with IEEE-450 (Ref. ~~V7~~) and IEEE-485 (Ref. ~~V8~~). These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer's rating, since IEEE-485 (Ref. ~~V8~~) recommends using an aging factor of 125% in the battery size calculation. A capacity of 80% shows that the battery rate of deterioration is increasing, even if there is ample capacity to meet the load requirements. However, since the 250 VDC batteries are not sized consistent with IEEE-485 (Ref. ~~V8~~), they must be replaced when their actual capacity is below the minimum acceptable battery capacity based on the load profile, which is a value greater than 80% of the manufacturer's rating.

The Frequency for this test is normally 60 months. If the battery shows degradation, or if the battery has reached 85% of its expected life and capacity is < 100% of the manufacturer's rating, the Surveillance Frequency is reduced to 12 months. However, if the battery shows no degradation but has reached 85% of its expected life, the Surveillance Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's rating. Degradation is indicated, consistent with IEEE-450 (Ref. ~~V7~~), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is

(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.4.8 (continued)

8 ~~\_\_\_\_\_~~  $\geq 10\%$  below the manufacturer's rating. The 12 month and 60 month Frequencies are consistent with the recommendations in IEEE-450 (Ref. ~~V7~~). The 24 month Frequency is derived from the recommendations of IEEE-450 (Ref. ~~V7~~). 8

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REFERENCES

1. UFSAR, Section 8.3.2.
  2. Safety Guide 6, March 10, 1971.
  3. IEEE Standard 308, 1978.
  4. UFSAR, Chapter 6.
  5. UFSAR, Chapter 15.
  6. ~~Regulatory Guide 1.93, Revision 0, December 1974.~~
  7. IEEE Standard 450, 1987.
  8. Regulatory Guide 1.32, Revision 2, February 1977.
  9. IEEE Standard 485, 1978.
- 

Insert 1



BASES

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ACTIONS

C.1 (continued)

systems are powered only from Unit 1, an inoperable Unit 1 AC electrical power distribution subsystem could result in a loss of the CREV System and Control Room Emergency Ventilation AC System functions (for both units).

With a standby gas treatment (SGT) subsystem inoperable, LCO 3.6.4.3 requires restoration of the inoperable SGT subsystem to OPERABLE status in 7 days. Similarly, with the CREV System inoperable, LCO 3.7.4 requires restoration of the inoperable CREV System to OPERABLE status within 7 days. With the Control Room Emergency Ventilation AC System inoperable, LCO 3.7.5 requires restoration of the inoperable Control Room Emergency Ventilation AC System to OPERABLE status in 30 days. Therefore, a 7 day Completion Time is provided to restore the required opposite unit AC and DC electrical power subsystems to OPERABLE status. The 7 day Completion Time is based on consideration of such factors as the availability of the OPERABLE redundant system(s) and the low probability of a DBA occurring during this time period.

The Required Action is modified by a Note indicating that the applicable Conditions of LCO 3.8.1 be entered and Required Actions taken if the inoperable opposite unit AC electrical power distribution subsystem results in an inoperable required offsite circuit. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

~~D.1 and D.2~~

If the inoperable distribution subsystem cannot be restored to OPERABLE status within the associated Completion Time, the unit 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 12 hours and to MODE 4 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.

overall plant risk is minimized →

Insert 1

is

(continued)

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BASES

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ACTIONS  
(continued)

E.1

Condition E corresponds to a level of degradation in the electrical power distribution system that causes a required safety function to be lost. When the inoperability of two or more AC or DC electrical power distribution subsystems, in combination, results in the loss of a required function, the plant is in a condition outside the accident analysis. Therefore, no additional time is justified for continued operation. LCO 3.0.3 must be entered immediately to commence a controlled shutdown. The term "in combination" means that the loss of function must result from the inoperability of two or more AC and DC electrical power distribution subsystems; a loss of function solely due to a single AC or DC electrical power distribution subsystem inoperability even with another AC or DC electrical power distribution subsystem concurrently inoperable, does not require entry into Condition E.

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.7.1

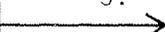
This Surveillance verifies that the AC and DC electrical power distribution subsystems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical divisions are maintained, and the appropriate voltage is available to each required bus. The verification of proper voltage availability on the buses ensures that the required voltage is readily available for motive as well as control functions for critical system loads connected to these buses. The 7 day Frequency takes into account the redundant capability of the AC and DC electrical power distribution subsystems, redundant power supplies available to the essential service and instrument 120 VAC buses, and other indications available in the control room that alert the operator to bus and subsystem malfunctions.

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REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. Regulatory Guide 1.93, December 1974.

Insert 2



LCO 3.4.3 Safety and Relief Valves

**Insert 1**

B.1

If the relief function of the inoperable relief valve or S/RV cannot be restored to OPERABLE status within the associated Completion Time of Required Action A.1, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant must be brought to MODE 3 within 12 hours. Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 5) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state. The allowed Completion Time is reasonable, based on operating experience, to reach required, plant conditions from full power conditions in an orderly manner and without challenging plant systems.

**Insert 2**

5. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

LCO 3.5.1 ECCS – Operating

**Insert 1**

H.1

If any required Action and associated Completion Time of Condition A, B, C, F or G is not met, the plant must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 11) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state. The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

**Insert 2**

11. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

### LCO 3.5.3 Reactor Core Isolation Cooling (RCIC) System

#### **Insert 1**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 3) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

#### **Insert 2**

3. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

### LCO 3.6.1.1 Primary Containment

#### **Insert 1**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 4), because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

#### **Insert 2**

4. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

### LCO 3.6.1.6 Low Set Relief Valves

#### **Insert 1**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 2) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

#### **Insert 2**

#### C.1 and C.2

If two low set relief valves are inoperable, there could be excessive short duration S/RV cycling during an overpressure event and 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 12 hours and MODE 4 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.

### **Insert 3**

2. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

#### LCO 3.6.1.7 Reactor Building-to-Suppression Chamber Vacuum Breakers

### **Insert 1**

#### D.1

If one line has one or more reactor building-to-suppression chamber vacuum breakers inoperable for opening and they are not restored within the Completion Time in Condition C, the remaining breakers in the remaining lines can provide the opening function. The plant must be brought to a condition in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 3) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state. The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant system.

### **Insert 2**

3. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

#### LCO 3.6.1.8 Suppression Chamber-to-Drywell Vacuum Breakers

### **Insert 1**

#### B.1

If a required suppression chamber-to-drywell vacuum breaker is inoperable for opening and is not restored to OPERABLE status within the required Completion Time, the plant must be brought to a condition in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 3) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state. The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

## **Insert 2**

3. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

### LCO 3.6.2.3 RHR Suppression Pool Cooling

#### **Insert 1**

##### B.1

If one RHR suppression pool cooling subsystem is inoperable and is not restored to OPERABLE status within the required Completion Time, the plant must be brought to a condition in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 2) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state. The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

2. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

### LCO 3.6.2.4 RHR Suppression Pool Spray

#### **Insert 1**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 2) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

#### **Insert 2**

2. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

### LCO 3.6.4.1 Secondary Containment

#### **Insert 1**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 4), because the time spent in

MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

**Insert 2**

4. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

LCO 3.6.4.3 Standby Gas Treatment (SGT) System

**Insert 1**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 9) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

**Insert 2**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk of MODE 4 (Ref. 8) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

**Insert 3**

8. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

LCO 3.7.1 Residual Heat Removal Service Water System

**Insert 1**

D.1

If one RHRSW subsystem is inoperable or one RHRSW pump in one or two subsystems is inoperable and not restored within the provided Completion Time, the plant must be brought to a condition in which the overall plant risk is minimized. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 5) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state. The allowed Completion Time is reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

## **Insert 2**

5. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

### LCO 3.7.4 Control Room Emergency Ventilation (CREV) System

## **Insert 1**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 7) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

## **Insert 2**

6. Regulatory Guide 1.52, Revision 2, March 1978.
7. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

### LCO 3.7.5 Control Room AC System

## **Insert 1**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 4) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

## **Insert 2**

4. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

### LCO 3.7.6 Main Condenser Offgas

## **Insert 1**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 3) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

## **Insert 2**

3. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

### LCO 3.8.1 AC Sources – Operating

## **Insert 1**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 9) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

## **Insert 2**

9. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

### LCO 3.8.4 DC Sources – Operating

## **Insert 1**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 6) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

## **Insert 2**

6. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

### LCO 3.8.7 Distribution Systems – Operating

## **Insert 1**

Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 4) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.

**Insert 2**

4. NEDC-32988-A, Revision 2, Technical Justification to Support Risk-Informed Modification to Selected Required End States for BWR Plants, December 2002.

**ATTACHMENT 4**  
List of Regulatory Commitments

The following table identifies those actions committed to by Exelon Generation Company, LLC (EGC) in this document. Any other statements in the submittal are provided for information purposes and are not considered to be regulatory commitments.

COMMITMENT	COMMITTED DATE	COMMITMENT TYPE	
		ONE-TIME ACTION (Yes/No)	PROGRAMMATIC (Yes/No)
EGC will follow the guidance established in Section 11 of NUMARC 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Nuclear Management and Resource Council, Revision 3, July 2000.	Ongoing	No	Yes
EGC will follow the guidance established in TSTF-IG-05-02, "Implementation Guidance for TSTF-423, Revision 0, 'Technical Specifications End States, NEDC-32988-A,'" Revision 1, March 2007.	Implement with amendment	No	Yes