

Tuesday, August 12, 2003

TSTF-03-02

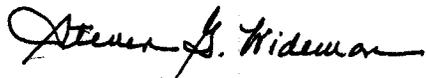
Dr. William D. Beckner, Director
Operating Reactor Improvements Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Dr. Beckner:

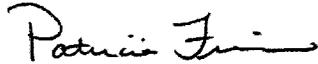
Enclosed for NRC consideration is Technical Specification Task Force Traveler TSTF-423, Revision 0, "Technical Specifications End States, NEI DC-32988-A." This Traveler supports NEI Risk Informed Technical Specification Task Force Initiative 1, "Technical Specification Required Actions Preferred End States."

We request that NRC review of the Traveler be granted a fee waiver pursuant to the provisions of 10 CFR 170.11. Specifically, the request is to support NRC generic regulatory improvements (risk management technical specifications), in accordance with 10 CFR 170.11(a)(1)(iii). This request is consistent with the NRC letter to A. R. Pietrangelo on this subject dated January 10, 2003.

Should you have any questions, please do not hesitate to contact us.



Steve Wideman (WOG)



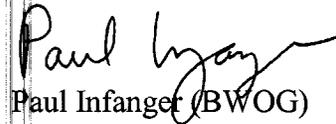
Patricia Furio (CEOG)

Enclosure

cc: A.R. Pietrangelo, NEI



Tom Silko (BWROG)



Paul Infanger (BWOG)

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Administered by EXCEL Services Corporation



Bcc: Steve Wideman (WOG)
Patricia Furio (CEOG)
Tom Silko (BWROG)
Ken Putnam (BWROG)
Paul Infanger (BWOOG)
Donald Hoffman (EXCEL)
Brian Mann (EXCEL)

Technical Specification Task Force Improved Standard Technical Specifications Change Traveler

Technical Specifications End States, NEDC-32988-A

NUREGs Affected: 1430 1431 1432 1433 1434

Classification: 1) Technical Change

Recommended for CLIIP?: Yes

Correction or Improvement: Improvement

Industry Contact: Tom Silko, (802) 258-4146, tsilko@entergy.com

See Attached.

Revision History

OG Revision 0

Revision Status: Active

Revision Proposed by: BWROG

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 29-May-03

Owners Group Comments:
(No Comments)

Owners Group Resolution: Approved Date: 21-Jul-03

TSTF Review Information

TSTF Received Date: 23-Jul-03 Date Distributed for Review: 23-Jul-03

OG Review Completed: BWOG WOG CEOG BWROG

TSTF Comments:
(No Comments)

TSTF Resolution: Approved Date: 08-Aug-03

NRC Review Information

NRC Received Date: 15-Aug-03

Affected Technical Specifications

Ref. 3.3.8.2 Bases

RPS Electric Power Monitorin

NUREG(s)- 1433 Only

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Action 3.3.8.2.C	RPS Electric Power Monitorin	NUREG(s)- 1433 Only
Action 3.3.8.2.C Bases	RPS Electric Power Monitorin	NUREG(s)- 1433 Only
Ref. 3.4.3 Bases	S/RVs	NUREG(s)- 1433 Only
Action 3.4.3.B	S/RVs	NUREG(s)- 1433 Only
Action 3.4.3.B Bases	S/RVs	NUREG(s)- 1433 Only
Action 3.4.3.C	S/RVs Change Description: New Action	NUREG(s)- 1433 Only
Action 3.4.3.C Bases	S/RVs Change Description: New Action	NUREG(s)- 1433 Only
SR 3.4.3.2 Bases	S/RVs	NUREG(s)- 1433 Only
Ref. 3.5.1 Bases	ECCS - Operating	NUREG(s)- 1433 Only
Action 3.5.1.B	ECCS - Operating	NUREG(s)- 1433 Only
Action 3.5.1.B Bases	ECCS - Operating	NUREG(s)- 1433 Only
Action 3.5.1.E Bases	ECCS - Operating	NUREG(s)- 1433 Only
Action 3.5.1.G	ECCS - Operating Change Description: New Action	NUREG(s)- 1433 Only
Action 3.5.1.G	ECCS - Operating Change Description: Renumbered to H and revised	NUREG(s)- 1433 Only
Action 3.5.1.G Bases	ECCS - Operating Change Description: Renumbered to H and revised	NUREG(s)- 1433 Only
Action 3.5.1.G Bases	ECCS - Operating Change Description: New Action	NUREG(s)- 1433 Only
Action 3.5.1.H	ECCS - Operating Change Description: Renumbered to I	NUREG(s)- 1433 Only
Action 3.5.1.H Bases	ECCS - Operating Change Description: Renumbered to I	NUREG(s)- 1433 Only
Ref. 3.5.3 Bases	RCIC System	NUREG(s)- 1433 Only
Action 3.5.3.B	RCIC System	NUREG(s)- 1433 Only
Action 3.5.3.B Bases	RCIC System	NUREG(s)- 1433 Only
Ref. 3.6.1.1 Bases	Primary Containment	NUREG(s)- 1433 Only
Action 3.6.1.1.B	Primary Containment	NUREG(s)- 1433 Only

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Action	3.6.1.1.B Bases	Primary Containment	NUREG(s)- 1433 Only
Ref.	3.6.1.6 Bases	LLS Valves	NUREG(s)- 1433 Only
Action	3.6.1.6.B	LLS Valves	NUREG(s)- 1433 Only
Action	3.6.1.6.B Bases	LLS Valves	NUREG(s)- 1433 Only
Action	3.6.1.6.C	LLS Valves Change Description: New Action	NUREG(s)- 1433 Only
Action	3.6.1.6.C Bases	LLS Valves Change Description: New Action	NUREG(s)- 1433 Only
SR	3.6.1.6.1 Bases	LLS Valves	NUREG(s)- 1433 Only
Ref.	3.6.1.7 Bases	Reactor Building-to-Suppression Chamber Vacuum Breakers	NUREG(s)- 1433 Only
Action	3.6.1.7.D	Reactor Building-to-Suppression Chamber Vacuum Breakers Change Description: New Action	NUREG(s)- 1433 Only
Action	3.6.1.7.D	Reactor Building-to-Suppression Chamber Vacuum Breakers Change Description: Renumbered to E	NUREG(s)- 1433 Only
Action	3.6.1.7.D Bases	Reactor Building-to-Suppression Chamber Vacuum Breakers Change Description: Renumbered to E	NUREG(s)- 1433 Only
Action	3.6.1.7.D Bases	Reactor Building-to-Suppression Chamber Vacuum Breakers Change Description: New Action	NUREG(s)- 1433 Only
Action	3.6.1.7.E	Reactor Building-to-Suppression Chamber Vacuum Breakers Change Description: Renumbered to F and Revised	NUREG(s)- 1433 Only
Action	3.6.1.7.E Bases	Reactor Building-to-Suppression Chamber Vacuum Breakers Change Description: Renumbered to F and Revised	NUREG(s)- 1433 Only
Ref.	3.6.1.8 Bases	Suppression Chamber-to-Drywell Vacuum Breakers	NUREG(s)- 1433 Only
Action	3.6.1.8.B	Suppression Chamber-to-Drywell Vacuum Breakers Change Description: New Action	NUREG(s)- 1433 Only
Action	3.6.1.8.B	Suppression Chamber-to-Drywell Vacuum Breakers Change Description: Renumbered to C	NUREG(s)- 1433 Only
Action	3.6.1.8.B Bases	Suppression Chamber-to-Drywell Vacuum Breakers Change Description: New Action	NUREG(s)- 1433 Only
Action	3.6.1.8.B Bases	Suppression Chamber-to-Drywell Vacuum Breakers Change Description: Renumbered to C	NUREG(s)- 1433 Only
Action	3.6.1.8.C	Suppression Chamber-to-Drywell Vacuum Breakers Change Description: Renumbered to D and Revised	NUREG(s)- 1433 Only

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Action 3.6.1.8.C Bases	Suppression Chamber-to-Drywell Vacuum Breakers Change Description: Renumbered to D and Revised	NUREG(s)- 1433 Only
Ref. 3.6.1.9 Bases	MSIV LCS	NUREG(s)- 1433 Only
Action 3.6.1.9.C	MSIV LCS	NUREG(s)- 1433 Only
Action 3.6.1.9.C Bases	MSIV LCS	NUREG(s)- 1433 Only
Ref. 3.6.2.3 Bases	RHR Suppression Pool Cooling	NUREG(s)- 1433 Only
Action 3.6.2.3.B	RHR Suppression Pool Cooling Change Description: New Action	NUREG(s)- 1433 Only
Action 3.6.2.3.B	RHR Suppression Pool Cooling Change Description: Renumbered to C	NUREG(s)- 1433 Only
Action 3.6.2.3.B Bases	RHR Suppression Pool Cooling Change Description: Renumbered to C	NUREG(s)- 1433 Only
Action 3.6.2.3.B Bases	RHR Suppression Pool Cooling Change Description: New Action	NUREG(s)- 1433 Only
Action 3.6.2.3.C	RHR Suppression Pool Cooling Change Description: Renumbered to D and Revised	NUREG(s)- 1433 Only
Action 3.6.2.3.C Bases	RHR Suppression Pool Cooling Change Description: Renumbered to D and Revised	NUREG(s)- 1433 Only
SR 3.6.2.3.2 Bases	RHR Suppression Pool Cooling	NUREG(s)- 1433 Only
Ref. 3.6.2.4 Bases	RHR Suppression Pool Spray	NUREG(s)- 1433 Only
Action 3.6.2.4.C	RHR Suppression Pool Spray	NUREG(s)- 1433 Only
Action 3.6.2.4.C Bases	RHR Suppression Pool Spray	NUREG(s)- 1433 Only
SR 3.6.2.4.1 Bases	RHR Suppression Pool Spray	NUREG(s)- 1433 Only
Ref. 3.6.4.1 Bases	Secondary Containment	NUREG(s)- 1433 Only
Action 3.6.4.1.B	Secondary Containment	NUREG(s)- 1433 Only
Action 3.6.4.1.B Bases	Secondary Containment	NUREG(s)- 1433 Only
Ref. 3.6.4.3 Bases	SGT System	NUREG(s)- 1433 Only
Action 3.6.4.3.B	SGT System	NUREG(s)- 1433 Only
Action 3.6.4.3.B Bases	SGT System	NUREG(s)- 1433 Only
Action 3.6.4.3.D	SGT System	NUREG(s)- 1433 Only

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Action 3.6.4.3.D Bases	SGT System	NUREG(s)- 1433 Only
Ref. 3.7.1 Bases	RHRWS System	NUREG(s)- 1433 Only
Action 3.7.1.D	RHRWS System Change Description: Renumbered to E	NUREG(s)- 1433 Only
Action 3.7.1.D	RHRWS System Change Description: New Action	NUREG(s)- 1433 Only
Action 3.7.1.D Bases	RHRWS System Change Description: Renumbered to E	NUREG(s)- 1433 Only
Action 3.7.1.D Bases	RHRWS System Change Description: New Action	NUREG(s)- 1433 Only
Action 3.7.1.E	RHRWS System Change Description: Renumbered to F	NUREG(s)- 1433 Only
Action 3.7.1.E Bases	RHRWS System Change Description: Renumbered to F	NUREG(s)- 1433 Only
Ref. 3.7.2 Bases	PSW System and UHS	NUREG(s)- 1433 Only
Action 3.7.2.C	PSW System and UHS Change Description: Renumbered to D	NUREG(s)- 1433 Only
Action 3.7.2.C	PSW System and UHS Change Description: New Action	NUREG(s)- 1433 Only
Action 3.7.2.C Bases	PSW System and UHS Change Description: New Action	NUREG(s)- 1433 Only
Action 3.7.2.C Bases	PSW System and UHS Change Description: Renumbered to D	NUREG(s)- 1433 Only
Action 3.7.2.D	PSW System and UHS Change Description: Renumbered to E	NUREG(s)- 1433 Only
Action 3.7.2.D Bases	PSW System and UHS Change Description: Renumbered to E	NUREG(s)- 1433 Only
Action 3.7.2.E	PSW System and UHS Change Description: Renumbered to F	NUREG(s)- 1433 Only
Action 3.7.2.E Bases	PSW System and UHS Change Description: Renumbered to F	NUREG(s)- 1433 Only
Action 3.7.2.F	PSW System and UHS Change Description: Renumbered to G and Revised	NUREG(s)- 1433 Only
Action 3.7.2.F Bases	PSW System and UHS Change Description: Renumbered to G and Revised	NUREG(s)- 1433 Only

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Ref. 3.7.4 Bases	MCREC System	NUREG(s)- 1433 Only
Action 3.7.4.C	MCREC System	NUREG(s)- 1433 Only
Action 3.7.4.C Bases	MCREC System	NUREG(s)- 1433 Only
Action 3.7.4.E	MCREC System	NUREG(s)- 1433 Only
Action 3.7.4.E Bases	MCREC System	NUREG(s)- 1433 Only
SR 3.7.4.3 Bases	MCREC System	NUREG(s)- 1433 Only
Ref. 3.7.5 Bases	Control Room AC System	NUREG(s)- 1433 Only
Action 3.7.5.B	Control Room AC System	NUREG(s)- 1433 Only
Action 3.7.5.B Bases	Control Room AC System	NUREG(s)- 1433 Only
Action 3.7.5.D	Control Room AC System	NUREG(s)- 1433 Only
Action 3.7.5.D Bases	Control Room AC System	NUREG(s)- 1433 Only
Ref. 3.7.6 Bases	Main Condenser Offgas	NUREG(s)- 1433 Only
Action 3.7.6.B	Main Condenser Offgas	NUREG(s)- 1433 Only
Action 3.7.6.B Bases	Main Condenser Offgas	NUREG(s)- 1433 Only
SR 3.8.1 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
Ref. 3.8.1 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
Action 3.8.1.G	AC Sources - Operating	NUREG(s)- 1433 Only
Action 3.8.1.G Bases	AC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.1.2 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.1.5 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.1.6 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.1.9 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.1.10 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.1.11 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.1.14 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.1.15 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.1.16 Bases	AC Sources - Operating	NUREG(s)- 1433 Only

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SR 3.8.1.17 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.1.18 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.1.20 Bases	AC Sources - Operating	NUREG(s)- 1433 Only
Ref. 3.8.4 Bases	DC Sources - Operating	NUREG(s)- 1433 Only
Action 3.8.4.D	DC Sources - Operating	NUREG(s)- 1433 Only
Action 3.8.4.D Bases	DC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.4.1 Bases	DC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.4.2 Bases	DC Sources - Operating	NUREG(s)- 1433 Only
SR 3.8.4.3 Bases	DC Sources - Operating	NUREG(s)- 1433 Only
Ref. 3.8.7 Bases	Inverters - Operating	NUREG(s)- 1433 Only
Action 3.8.7.B	Inverters - Operating	NUREG(s)- 1433 Only
Action 3.8.7.B Bases	Inverters - Operating	NUREG(s)- 1433 Only
Ref. 3.8.9	Distribution Systems - Operating	NUREG(s)- 1433 Only
Action 3.8.9.D	Distribution Systems - Operating	NUREG(s)- 1433 Only
Action 3.8.9.D	Distribution Systems - Operating	NUREG(s)- 1433 Only
Ref. 3.3.8.2 Bases	RPS Electric Power Monitoring	NUREG(s)- 1434 Only
Action 3.3.8.2.C	RPS Electric Power Monitoring	NUREG(s)- 1434 Only
Action 3.3.8.2.C Bases	RPS Electric Power Monitoring	NUREG(s)- 1434 Only
SR 3.3.8.2.1 Bases	RPS Electric Power Monitoring	NUREG(s)- 1434 Only
Ref. 3.4.4 Bases	S/RVs	NUREG(s)- 1434 Only
Action 3.4.4.B	S/RVs	NUREG(s)- 1434 Only
Action 3.4.4.B Bases	S/RVs	NUREG(s)- 1434 Only
Action 3.4.4.C	S/RVs Change Description: New Action	NUREG(s)- 1434 Only
Action 3.4.4.C Bases	S/RVs Change Description: New Action	NUREG(s)- 1434 Only
Ref. 3.5.1 Bases	ECCS - Operating	NUREG(s)- 1434 Only
Action 3.5.1.D	ECCS - Operating	NUREG(s)- 1434 Only

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Action 3.5.1.D Bases	ECCS - Operating	NUREG(s)- 1434 Only
Action 3.5.1.E Bases	ECCS - Operating	NUREG(s)- 1434 Only
Action 3.5.1.G	ECCS - Operating	NUREG(s)- 1434 Only
Action 3.5.1.G Bases	ECCS - Operating	NUREG(s)- 1434 Only
SR 3.5.1.3 Bases	ECCS - Operating	NUREG(s)- 1434 Only
Ref. 3.6.1.1 Bases	Primary Containment	NUREG(s)- 1434 Only
Action 3.6.1.1.B	Primary Containment	NUREG(s)- 1434 Only
Action 3.6.1.1.B Bases	Primary Containment	NUREG(s)- 1434 Only
SR 3.6.1.1.2 Bases	Primary Containment	NUREG(s)- 1434 Only
Ref. 3.6.1.6 Bases	LLS Valves	NUREG(s)- 1434 Only
Action 3.6.1.6.B	LLS Valves	NUREG(s)- 1434 Only
Action 3.6.1.6.B	LLS Valves	NUREG(s)- 1434 Only
Action 3.6.1.6.C	LLS Valves Change Description: New Action	NUREG(s)- 1434 Only
Action 3.6.1.6.C Bases	LLS Valves Change Description: New Action	NUREG(s)- 1434 Only
SR 3.6.1.6.1 Bases	LLS Valves	NUREG(s)- 1434 Only
Ref. 3.6.1.7 Bases	RHR Containment Spray System	NUREG(s)- 1434 Only
Action 3.6.1.7.C	RHR Containment Spray System	NUREG(s)- 1434 Only
Action 3.6.1.7.C Bases	RHR Containment Spray System	NUREG(s)- 1434 Only
SR 3.6.1.7.2 Bases	RHR Containment Spray System	NUREG(s)- 1434 Only
Ref. 3.6.1.8 Bases	PVLCS	NUREG(s)- 1434 Only
Action 3.6.1.8.C	PVLCS	NUREG(s)- 1434 Only
Action 3.6.1.8.C Bases	PVLCS	NUREG(s)- 1434 Only
Ref. 3.6.1.9 Bases	MSIV LCS	NUREG(s)- 1434 Only
Action 3.6.1.9.C	MSIV LCS	NUREG(s)- 1434 Only
Action 3.6.1.9.C Bases	MSIV LCS	NUREG(s)- 1434 Only
Ref. 3.6.2.3 Bases	RHR Suppression Pool Cooling	NUREG(s)- 1434 Only

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Action 3.6.2.3.B	RHR Suppression Pool Cooling Change Description: Renumbered to C	NUREG(s)- 1434 Only
Action 3.6.2.3.B	RHR Suppression Pool Cooling Change Description: New Action	NUREG(s)- 1434 Only
Action 3.6.2.3.B	RHR Suppression Pool Cooling Change Description: New Action	NUREG(s)- 1434 Only
Action 3.6.2.3.B Bases	RHR Suppression Pool Cooling Change Description: Renumbered to C	NUREG(s)- 1434 Only
Action 3.6.2.3.C	RHR Suppression Pool Cooling Change Description: Renumbered to D and Revised	NUREG(s)- 1434 Only
Action 3.6.2.3.C Bases	RHR Suppression Pool Cooling Change Description: Renumbered to D and Revised	NUREG(s)- 1434 Only
SR 3.6.2.3.2 Bases	RHR Suppression Pool Cooling	NUREG(s)- 1434 Only
Ref. 3.6.4.1 Bases	Secondary Containment	NUREG(s)- 1434 Only
Action 3.6.4.1.B	Secondary Containment	NUREG(s)- 1434 Only
Action 3.6.4.1.B Bases	Secondary Containment	NUREG(s)- 1434 Only
Ref. 3.6.4.3 Bases	SGT System	NUREG(s)- 1434 Only
Action 3.6.4.3.B	SGT System	NUREG(s)- 1434 Only
Action 3.6.4.3.B Bases	SGT System	NUREG(s)- 1434 Only
Action 3.6.4.3.D	SGT System	NUREG(s)- 1434 Only
Action 3.6.4.3.D Bases	SGT System	NUREG(s)- 1434 Only
Ref. 3.6.5.6 Bases	Drywell Vacuum Relief System	NUREG(s)- 1434 Only
Action 3.6.5.6.D	Drywell Vacuum Relief System Change Description: Renumbered to E	NUREG(s)- 1434 Only
Action 3.6.5.6.D	Drywell Vacuum Relief System Change Description: New Action	NUREG(s)- 1434 Only
Action 3.6.5.6.D Bases	Drywell Vacuum Relief System Change Description: Renumbered to E	NUREG(s)- 1434 Only
Action 3.6.5.6.D Bases	Drywell Vacuum Relief System Change Description: New Action	NUREG(s)- 1434 Only
Action 3.6.5.6.E	Drywell Vacuum Relief System Change Description: Renumbered to F	NUREG(s)- 1434 Only

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Action 3.6.5.6.E Bases	Drywell Vacuum Relief System Change Description: Renumbered to F	NUREG(s)- 1434 Only
Action 3.6.5.6.F	Drywell Vacuum Relief System Change Description: Renumbered to G and Revised	NUREG(s)- 1434 Only
Action 3.6.5.6.F Bases	Drywell Vacuum Relief System Change Description: Renumbered to G and Revised	NUREG(s)- 1434 Only
Action 3.6.5.6.G	Drywell Vacuum Relief System Change Description: Renumbered to H	NUREG(s)- 1434 Only
Action 3.6.5.6.G Bases	Drywell Vacuum Relief System Change Description: Renumbered to H	NUREG(s)- 1434 Only
Ref. 3.7.1 Bases	SSW System and UHS	NUREG(s)- 1434 Only
Action 3.7.1.B	SSW System and UHS Change Description: Renumbered to D	NUREG(s)- 1434 Only
Action 3.7.1.B Bases	SSW System and UHS Change Description: Renumbered to D	NUREG(s)- 1434 Only
Action 3.7.1.C	SSW System and UHS Change Description: Renumbered to B	NUREG(s)- 1434 Only
Action 3.7.1.C	SSW System and UHS Change Description: New Action	NUREG(s)- 1434 Only
Action 3.7.1.C Bases	SSW System and UHS Change Description: New Action	NUREG(s)- 1434 Only
Action 3.7.1.C Bases	SSW System and UHS Change Description: Renumbered to B	NUREG(s)- 1434 Only
Action 3.7.1.D	SSW System and UHS Change Description: Renumbered to E	NUREG(s)- 1434 Only
Action 3.7.1.D Bases	SSW System and UHS Change Description: Renumbered to E	NUREG(s)- 1434 Only
Ref. 3.7.3 Bases	CRFA System	NUREG(s)- 1434 Only
Action 3.7.3.C	CRFA System	NUREG(s)- 1434 Only
Action 3.7.3.C Bases	CRFA System	NUREG(s)- 1434 Only
Action 3.7.3.E	CRFA System	NUREG(s)- 1434 Only
Action 3.7.3.E Bases	CRFA System	NUREG(s)- 1434 Only
SR 3.7.3.3 Bases	CRFA System	NUREG(s)- 1434 Only
Ref. 3.7.4 Bases	Control Room AC System	NUREG(s)- 1434 Only

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Action 3.7.4.B	Control Room AC System	NUREG(s)- 1434 Only
Action 3.7.4.B Bases	Control Room AC System	NUREG(s)- 1434 Only
Action 3.7.4.D	Control Room AC System	NUREG(s)- 1434 Only
Action 3.7.4.D Bases	Control Room AC System	NUREG(s)- 1434 Only
Ref. 3.7.5 Bases	Main Condenser Offgas	NUREG(s)- 1434 Only
Action 3.7.5.B	Main Condenser Offgas	NUREG(s)- 1434 Only
Action 3.7.5.B Bases	Main Condenser Offgas	NUREG(s)- 1434 Only
SR 3.8.1 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
Ref. 3.8.1 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
Action 3.8.1.G	AC Sources - Operating	NUREG(s)- 1434 Only
Action 3.8.1.G Bases	AC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.1.2 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.1.5 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.1.6 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.1.9 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.1.10 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.1.11 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.1.14 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.1.15 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.1.16 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.1.17 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.1.18 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.1.20 Bases	AC Sources - Operating	NUREG(s)- 1434 Only
Ref. 3.8.4 Bases	DC Sources - Operating	NUREG(s)- 1434 Only
Action 3.8.4.D	DC Sources - Operating Change Description: New Action	NUREG(s)- 1434 Only
Action 3.8.4.D	DC Sources - Operating Change Description: Renumbered to E	NUREG(s)- 1434 Only

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Action 3.8.4.D Bases	DC Sources - Operating Change Description: New Action	NUREG(s)- 1434 Only
Action 3.8.4.D Bases	DC Sources - Operating Change Description: Renumbered to E	NUREG(s)- 1434 Only
Action 3.8.4.E	DC Sources - Operating Change Description: Renumbered to F and Revised	NUREG(s)- 1434 Only
Action 3.8.4.E Bases	DC Sources - Operating Change Description: Renumbered to F and Revised	NUREG(s)- 1434 Only
SR 3.8.4.1 Bases	DC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.4.2 Bases	DC Sources - Operating	NUREG(s)- 1434 Only
SR 3.8.4.3 Bases	DC Sources - Operating	NUREG(s)- 1434 Only
Ref. 3.8.7 Bases	Inverters - Operating	NUREG(s)- 1434 Only
Action 3.8.7.B	Inverters - Operating Change Description: Renumbered to C	NUREG(s)- 1434 Only
Action 3.8.7.B	Inverters - Operating Change Description: New Action	NUREG(s)- 1434 Only
Action 3.8.7.B Bases	Inverters - Operating Change Description: Renumbered to C	NUREG(s)- 1434 Only
Action 3.8.7.B Bases	Inverters - Operating Change Description: New Action	NUREG(s)- 1434 Only
Action 3.8.7.C	Inverters - Operating Change Description: Renumbered to D and Revised	NUREG(s)- 1434 Only
Action 3.8.7.C Bases	Inverters - Operating Change Description: Renumbered to D and Revised	NUREG(s)- 1434 Only
Ref. 3.8.9 Bases	Distribution Systems - Operating	NUREG(s)- 1434 Only
Action 3.8.9.D	Distribution Systems - Operating	NUREG(s)- 1434 Only
Action 3.8.9.D Bases	Distribution Systems - Operating	NUREG(s)- 1434 Only

11-Aug-03

1.0 Description

Topical Report NEDC-32988-A, “Technical Justification to Support Risk-Informed Modification to Selected Required Action End States for BWR Plants,” Revision 2, December 2002, (Reference 1) justified modifying the Technical Specifications end state for selected Required Actions in NUREG-1433, “Standard Technical Specifications for BWR/4 Plants,” and NUREG-1434, “Standard Technical Specifications for BWR/6 Plants.” These Required Actions are modified to allow the plant to stay in MODE 3. The Topical Report was approved in a letter from the NRC to Jack Gray, Chairman of the BWR Owners Group, dated September 27, 2002, entitled, “Safety Evaluation of Topical Report NEDC-32988, Rev. 2, ‘Technical Justification to Support Risk-Informed Modification to Selected Required Action End States for BWR Plants,’ (TAC No. MB1054)” (Reference 2).

This Traveler implements the changes justified in the Topical Report and approved in the Safety Evaluation.

2.0 Proposed Change

The Topical Report and Safety Evaluation describe changes to 22 Technical Specifications in NUREG-1433, which apply to BWR/4 plants, and 20 Technical Specifications in NUREG-1434, which apply to BWR/6 plants. The affected Specifications are listed in Table 1. Appropriate Bases changes are also made to reflect the changes to the Specifications.

As new references are added to the Bases, existing references are renumbered as necessary so that the numeric order of the references in the “References” subsection matches the order of their discussion in the text. This is consistent with Section 4.2.1.g of NEI 01-03, “Writer’s Guide for the Improved Standard Technical Specifications.”

3.0 Background

NEDC-32988-A justified the modification of 42 Technical Specifications Required Action end states. The modified end states allow the plant to remain in MODE 3 instead of going to MODE 4 or to MODE 3 with steam dome pressure ≤ 150 psig.

4.0 Technical Analysis

The Topical Report provides a systematic review of the risks associated with all Required Actions in Technical Specifications ending in placing the unit in cold shutdown (MODE 4). Cold shutdown is normally required when an inoperable system or train cannot be restored to an OPERABLE status within the allowed time. However, going to cold shutdown results in the loss of steam-driven core cooling systems, challenges the shutdown heat removal systems, and requires restarting the plant over a greater range of plant conditions. A more preferred operational MODE is one that maintains adequate risk levels while repairs are completed without causing unnecessary challenges to plant equipment during shutdown and startup transitions. The Topical Report analysis considered hot shutdown (MODE 3) as a preferred alternative to cold shutdown.

The risks during the two MODES of operation were evaluated using the Probabilistic Safety Analysis (PSA) for a typical BWR-4 plant, but the results are applicable for all the BWR models (BWR-2 through 6). The plant-specific PSA model was modified to evaluate the core damage frequency (CDF) during MODE 3 and MODE 4 operations. This allowed a comparison of the risks between the two shutdown MODES for various inoperable conditions specified in Technical Specifications. In addition to the quantitative analysis, the two MODES of operation were evaluated based on defense-in-depth considerations.

The Topical Report demonstrates that, for the modified conditions, remaining in MODE 3 is appropriate for the primary purpose of performing the short-duration repairs needed to correct the failure which necessitated exiting the original operating MODE. In response to the Staffs' questions, the BWROG stated that "The BWRs are most likely to stay in hot shutdown for no more than 2 to 3 days and definitely, not more than a week." In the Safety Evaluation, the staff stated that they expect that the licensees will follow this guidance.

The proposed changes to NUREG-1433 and NUREG-1434 are consistent with the justification presented in the Topical Report as approved by the Safety Evaluation. In some cases, there are editorial differences between the changes described in the Topical Report and Safety Evaluation and the changes made to NUREG-1433 and NUREG-1434. These differences are described in Notes to Table 1. In all cases, the changes made to NUREG-1433 and NUREG-1434 are consistent with the justification presented in the Topical Report and the approval in the Safety Evaluation.

The letter transmitting the Safety Evaluation (Reference 2) states, "Licensees requesting a license amendment to revise their end states must include in their amendment requests plant-specific information addressing the stipulations identified in Section 7.0 of the SE." These stipulations have been addressed in this Traveler as discussed in Table 2.

5.0 Regulatory Analysis

5.1 No Significant Hazards Consideration

The Technical Specification Task Force (TSTF) has evaluated whether or not a significant hazards consideration is involved with the proposed generic change by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

Required Actions are not an initiator of any accident previously evaluated. Therefore, the proposed changes do not affect the probability of any accident previously evaluated. NEDC-32988-A demonstrated that the proposed changes in the required end state do not significantly increase the consequences of any accidents previously evaluated.

Therefore, it is concluded that this change does not significantly increase the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. In addition, the changes do not impose any significant new or different requirements. The changes do not alter assumptions made in the safety analysis.

Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

NEDC-32988-A demonstrated that the changed end states represent a condition of equal or lower risk than the original end states.

Therefore, it is concluded that this change does not involve a significant reduction in the margin of safety.

Based on the above, the TSTF concludes that the proposed change presents no significant hazards considerations under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of “no significant hazards consideration” is justified.

5.2 Applicable Regulatory Requirements/Criteria

Required Actions are not specified by any regulatory requirement or criteria. The Limiting Conditions for Operation, which are based on accident analysis assumptions and regulatory requirements, are not affected by this change. Therefore, no regulatory requirements or criteria are affected by this change.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission’s regulations, and (3) the approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

6.0 Environmental Consideration

A review has determined that the proposed change would not change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would not change an inspection or surveillance requirement. The proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

7.0 References

1. Topical Report NEDC-32988-A, "Technical Justification to Support Risk-Informed Modification to Selected Required Action End States for BWR Plants," Revision 2, December 2002.
2. Letter from the NRC to Jack Gray, Chairman of the BWR Owners Group, dated September 27, 2002, entitled, "Safety Evaluation of Topical Report NEDC-32988, Rev. 2, 'Technical Justification to Support Risk-Informed Modification to Selected Required Action End States for BWR Plants,' (TAC No. MB1054)."

Table 1
Deviation from the Topical Report or Safety Evaluation

Design	Specification	Title	Topical Report Section	Safety Evaluation Section	Deviations from the Topical Report or Safety Evaluation
BWR/4	3.3.8.2	RPS Electric Power Monitoring	4.5.1.1	6.5	None
BWR/4	3.4.3	Safety / Relief Valves	4.5.1.2	6.1	None
BWR/4	3.5.1	ECCS - Operating	4.5.1.3	6.2	None
BWR/4	3.5.3	RCIC System	4.5.1.4	6.3	None
BWR/4	3.6.1.1	Primary Containment	4.5.1.5	6.10	See Note 11.
BWR/4	3.6.1.6	LLS Valves	4.5.1.6	6.4	None
BWR/4	3.6.1.7	Reactor Building-to-Suppression Chamber Vacuum Breakers	4.5.1.7	6.11	See Note 1.
BWR/4	3.6.1.8	Suppression Chamber-to-Drywell Vacuum Breakers	4.5.1.8	6.12	See Note 1.
BWR/4	3.6.1.9	MSIV LCS	4.5.1.9	6.13	None
BWR/4	3.6.2.3	RHR Suppression Pool Cooling	4.5.1.10	6.24	See Note 10.
BWR/4	3.6.2.4	RHR Suppression Pool Spray	4.5.1.11	6.14	None
BWR/4	3.6.4.1	Secondary Containment	4.5.1.12	6.15	See Note 11.
BWR/4	3.6.4.3	SGT System	4.5.1.13	6.16	None
BWR/4	3.7.1	RHRSW System	4.5.1.14	6.17	None
BWR/4	3.7.2	PSW System and UHS	4.5.1.15	6.18	See Notes 1 and 2.
BWR/4	3.7.4	MCREC System	4.5.1.16	6.19	See Note 3.
BWR/4	3.7.5	Control Room AC System	4.5.1.17	6.20	None
BWR/4	3.7.6	Main Condenser Offgas	4.5.1.18	6.21	See Note 4.
BWR/4	3.8.1	AC Sources - Operating	4.5.1.19	6.6	None
BWR/4	3.8.4	DC Sources - Operating	4.5.1.20	6.7	See Note 5.
BWR/4	3.8.7	Inverters - Operating	4.5.1.21	6.8	None
BWR/4	3.8.9	Distribution Systems - Operating	4.5.1.22	6.9	None

Design	Specification	Title	Topical Report Section	Safety Evaluation Section	Deviations from the Topical Report or Safety Evaluation
BWR/6	3.3.8.2	RPS Electric Power Monitoring	4.5.2.1	6.5	None
BWR/6	3.4.4	Safety / Relief Valves	4.5.2.2	6.1	None
BWR/6	3.5.1	ECCS - Operating	4.5.2.3	6.2	None
BWR/6	3.6.1.1	Primary Containment	4.5.2.4	6.10	See Note 11.
BWR/6	3.6.1.6	LLS Valves	4.5.2.5	6.4	None
BWR/6	3.6.1.7	RHR Containment Spray	4.5.2.6	6.22	None
BWR/6	3.6.1.8	Penetration Valve Leakage Control System	4.5.2.7	6.23	None
BWR/6	3.6.1.9	MSIV LCS	4.5.2.8	6.13	None
BWR/6	3.6.2.3	RHR Suppression Pool Cooling	4.5.2.9	6.24	See Note 6.
BWR/6	3.6.4.1	Secondary Containment	4.5.2.10	6.15	See Note 11.
BWR/6	3.6.4.3	SGT System	4.5.2.11	6.16	None
BWR/6	3.6.5.6	Drywell Vacuum Relief System	4.5.2.12	6.25	See Note 1.
BWR/6	3.7.1	SSW System and UHS	4.5.2.13	6.26	See Note 7.
BWR/6	3.7.3	CRFA System	4.5.2.14	6.27	See Note 8.
BWR/6	3.7.4	CRAC System	4.5.2.15	6.28	None
BWR/6	3.7.5	Main Condenser Offgas	4.5.2.16	6.29	See Note 4.
BWR/6	3.8.1	AC Sources - Operating	4.5.2.17	6.6	None
BWR/6	3.8.4	DC Sources - Operating	4.5.2.18	6.7	See Note 9.
BWR/6	3.8.7	Inverters - Operating	4.5.2.19	6.8	None
BWR/6	3.8.9	Distribution Systems - Operating	4.5.2.20	6.9	None

Notes:

- 1) The order of the Conditions is changed from that described in the Topical Report and Safety Evaluation. According to NEI 01-03, Writer's Guide for the ISTS, Section 4.1.6.i.5, Conditions stating "Required Action and associated Completion Time not met," should follow after the last Condition to which it applies. Therefore, the new MODE 3 End State Condition is inserted after the applicable Condition and the subsequent Conditions are renumbered. This does not affect the justification.

- 2) The changes described in the Topical Report and the Safety Evaluation are based on Revision 1 of NUREG-1433. In Revision 2, there is an additional Action (Action D). This additional Action does not affect the justification, but does affect the numbering of the Actions that are revised.
- 3) The changes described in the Topical Report and the Safety Evaluation are based on Revision 1 of NUREG-1433. In Revision 2, there is an additional Action (Action B). This Action applies when two MCREC subsystems are inoperable due to an inoperable control room boundary in MODE 1, 2, or 3. Since the Topical Report and the Safety Evaluation justify remaining in MODE 3 when two MCREC subsystems are inoperable for any reason, the MODE 3 end state also is applied to not meeting the Required Action and associated Completion Times of Condition B.
- 4) No deviations from the Topical Report or the Safety Evaluation. However, deletion of Required Action B.3.2 necessitates the additional change of renaming Required Action B.3.1 to B.3.
- 5) The changes described in the Topical Report and the Safety Evaluation are based on Revision 1 of NUREG-1433. In Revision 2, Condition A (one DC electrical power subsystem inoperable) is divided into three Conditions (A - one or two battery chargers in one division inoperable, B - one or two batteries on one division inoperable, and C - one DC electrical power subsystems inoperable for reasons other than Condition A or B). Since the Topical Report and the Safety Evaluation justify remaining in MODE 3 when one DC electrical power subsystem is inoperable for any reason, the MODE 3 end state is applied to not meeting the Required Action and associated Completion Time of Condition A, B, or C.
- 6) The changes described in the Topical Report and the Safety Evaluation are based on Revision 1 of NUREG-1434. Condition A applies on one inoperable RHR suppression pool cooling subsystem and Condition B applies to two inoperable subsystems. Condition C applies when the Required Actions and associated Completion Times are not met. Therefore, the changes corresponding to the justification given in the Topical and the Safety Evaluation are the addition of a new Condition B which applies when the Required Actions and associated Completion Time of Condition A are not met. Condition B requires being in MODE 3 in 12 hours. Condition C (now D) is modified to only apply to two inoperable RHR suppression pool cooling subsystems (now Condition C). These changes do not affect the justification.
- 7) The changes described in the Topical Report and the Safety Evaluation are based on Revision 1 of NUREG-1434. In Revision 2, there is a new Condition B which applies when the UHS temperature is water temperature is $> 90^{\circ}\text{F}$ and less than a plant-specific limit. In order to implement the end state change and follow the guidance in NEI 01-03, Condition B is moved to Condition D and Condition C is moved to Condition B. A new Condition C is added which applies when the Required Action and associated Completion Time of Condition A or B are not met. This change does not affect the justification.
- 8) The changes described in the Topical Report and the Safety Evaluation are based on Revision 1 of NUREG-1434. In Revision 2, there is an additional Action (Action B). This Action

applies when two CRFA subsystems are inoperable due to an inoperable control room boundary in MODE 1, 2, or 3. Since the Topical Report and the Safety Evaluation justify remaining in MODE 3 when two CRFA subsystems are inoperable for any reason, the MODE 3 end state is applied to not meeting the Required Action and associated Completion Times of Condition B.

- 9) The changes described in the Topical Report and the Safety Evaluation are based on Revision 1 of NUREG-1434. In Revision 2, Condition A (Division 1 or 2 DC electrical power subsystem inoperable) is divided into three Conditions (A - one or two battery chargers in one division inoperable, B - one or two batteries on one division inoperable, and C - one Division 1 or 2 DC electrical power subsystems inoperable for reasons other than Condition A or B). Since the Topical Report and the Safety Evaluation justify remaining in MODE 3 when one Division 1 or 2 DC electrical power subsystem is inoperable for any reason, the MODE 3 end state is applied to not meeting the Required Action and associated Completion Times of Condition A, B, or C. Modifications are made to apply the MODE 4 end state to a Division 3 DC electrical power subsystem inoperable for any reason. This presentation is consistent with the justification in the Topical Report and the Safety Evaluation.
- 10) The changes described in the Topical Report and the Safety Evaluation are based on Revision 1 of NUREG-1433. In Revision 2, there is an additional Action (Action B). This additional Action does not affect the justification, but does affect the numbering of the Actions that are revised.
- 11) The Safety Evaluation finding for these changes referenced the availability of other systems to maintain defense in depth. These specific references to the availability of other systems are not included in the Traveler. The purpose of the new MODE 3 end state is to allow for performance of maintenance to restore the inoperable system or component. For this situation, 10 CFR 50.65(a)(4) requires that risk impacts of maintenance activity be assessed and managed, and this assessment includes consideration of both the system or component undergoing maintenance and other systems that may be inoperable. Guidance for 10 CFR 50.65(a)(4) risk assessments is provided in Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants," which endorses the guidance in Section 11 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Since application of 10 CFR 50.65(a)(4) risk assessments include consideration of the system undergoing maintenance and the operability of other systems, it is not necessary to explicitly reference the other systems referenced in the SER.

Table 2
Implementation of Section 7.0 Stipulations from the Safety Evaluation

Section 7.0 of the Safety Evaluation, “Commitments Needed to Implement the TSs Related to Topical Report NEDC-32988,” states,

Any licensee requesting the TS changes to operate a plant in accordance with this BWROG topical report, must commit to implement the following stipulations in the TS or its associated Bases. The following stipulations assure that the implementation of this topical report will be consistent with staff’s safety evaluation:

Each of the stipulations provided in the Safety Evaluation will be implemented by licensees requesting to adopt the Traveler. However, as discussed below, the Technical Specifications or Bases are not always the appropriate documents to implement the stipulations. The implementation of each of the stipulations is described below.

1. *Entry into the shutdown modes approved in this SE shall be for the primary purpose of accomplishing short-duration repairs which necessitated exiting the original operating mode. In response to the staffs questions, the BWROG stated that "The BWRs are most likely to stay in hot shutdown for no more than 2 to 3 days and definitely, not more than a week." The staff expects that the licensees will follow this guidance.*

Implementation

The Bases for each modified Required Action which allows remaining in MODE 3 is modified to include the following statement, “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 and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short.” Regarding the specific time limits, a BWR in MODE 3 only generates sufficient decay heat to remain in MODE 3 for 2 to 3 days, and for not more than a week. Therefore, this is not an administrative limitation, but a physical limitation. As a result, there is no need for a licensee to incorporate these specific times in the Technical Specifications or Bases.

2. *Appropriate plant procedures and administrative controls will be used when the plant is operated in the proposed end states.*

Implementation

Licensees will implement appropriate plant procedures and administrative controls to be used when the plant is operated in the proposed end states as required by Technical Specification 5.4, “Procedures,” and 10 CFR 50, Appendix B. Appropriate plant procedures and administrative controls must be used when the plant is operated in any plant operating MODE. The MODE 3 end states are not unique in this regard. Therefore, this stipulation is not appropriate for inclusion in the Technical Specifications or Bases as it does not provide guidance to the operator that is unique to the conditions to be entered.

3. *Entry into and use of the proposed end states shall be in accordance with the requirements of 10 CFR 50.65(b)(4). The licensee should do a risk assessment with respect to performance of the key shutdown safety functions, as described in Section 4 of this SE.*

(There is no 10 CFR 50.65(b)(4); it is assumed that the reference was to 10 CFR 50.65(a)(4).)

Implementation

Use of the new MODE 3 end states will be accompanied by the performance of maintenance to restore the inoperable system or component. When performing maintenance, licensees are required to perform a risk assessment by 10 CFR 50.65(a)(4). This risk assessment is in accordance with the plant procedures in place to implement 10 CFR 50.65(a)(4) and envelopes the situation where entering a MODE or other specified condition in the applicability is contemplated with plant equipment inoperable. Those plant procedures will follow the guidance in NUMARC 93-01, "Assessment of Resulting from Performance of Maintenance Activities," Section 11, as revised in February 2000 and as endorsed by NRC Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants." The risk evaluations performed in accordance with these documents consider the key shutdown safety functions. Therefore, implementation of these end state changes imposes no new requirements with regard to implementation of 10 CFR 50.65(a)(4). As a result, this stipulation is not appropriate for inclusion in the Technical Specifications or Bases as it is contrary to the content and format of the Improved Standard Technical Specifications to repeat regulatory requirements in the Technical Specifications.

4. *The purpose of the BWROG request is to allow corrective maintenance in a safe operating mode after an CT has been exceeded and minimize the corrective action time so that the plant can be restored to power operation. Ordinarily the failures result in a degraded plant condition. Consequently, with respect to additional licensee outage activities that could affect the safe conduct of operations and that are not directly required for correction of the failure or failures that caused the CT to be exceeded, a licensee must make two commitments:*
 - a. *The licensee will perform a safety assessment in accordance with the maintenance rule prior to undertaking such additional activities.*
 - b. *If conditions change so that the safety assessment is no longer valid, the licensee will suspend all such additional activities via a process consistent with safety until the assessment has been revalidated. The staff expects the licensee to make a contingency plan to address this situation. The contingency plan may require such actions as (1) suspending the activity until conditions are again appropriate, (2) terminating the activity and starting over when conditions are again appropriate, and (3) continuing the activity if safety is best ensured by completing the activity. The staff recognizes that such decisions may have to be made on the basis of engineering judgment should an unforeseen situation arise.*

Implementation

Use of the new MODE 3 end states will be accompanied by the performance of maintenance to restore the inoperable system or component. When performing maintenance licensees are required to perform a risk assessment by 10 CFR 50.65(a)(4). This risk assessment must consider all maintenance being performed, regardless of whether the maintenance is related to restoring the inoperable equipment which lead to the use of the new MODE 3 end state. Therefore, the inclusion of stipulation 4.a in the Technical Specifications or Bases is not needed as it is unnecessary for a licensee to commit to follow the requirements in 10 CFR 50.65(a)(4). The requirements of 10 CFR 50 are imposed by regulation.

If plant conditions change during performance of maintenance, 10 CFR 50.65(a)(4) requires the new condition to be evaluated, and if necessary, risk management actions to be taken. The actions may include stopping the maintenance activity, taking other risk management actions, or completing the activity. These actions are implemented in plant procedures. Therefore, inclusion of stipulation 4.b in the Technical Specifications or Bases is not needed as it is unnecessary for a licensee to commit to having a contingency plan to follow the requirements in 10 CFR 50.65(a)(4). The requirements of 10 CFR 50 are already imposed by regulation.

In addition, it is contrary to the content and format of the Improved Standard Technical Specifications to repeat regulatory requirements in the Technical Specifications.

5. *The requested end state changes do not prohibit licensees from entering cold shutdown if they wish to do so for operational reasons or maintenance requirements. In such cases, the specific requirements associated with the requested end state changes do not apply.*

Implementation

The Bases for each modified Required Action which allows remaining in MODE 3 is modified to include the following statement, “Voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state.” As stated above, the specific requirements associated with the MODE 3 end states are not unique to implementation of this change. Therefore, it is not necessary to implement the qualification that these requirements do not apply if cold shutdown is entered. Once MODE 4 is entered, the subject Technical Specifications do not apply. Therefore, any requirements associated with the modified Required Actions are not applicable. As a result, it is not necessary to implement this stipulation in the Technical Specifications or Bases.

BWR/4 LCO 3.3.8.2 RPS Electric Power Monitoring

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.

3.3 INSTRUMENTATION

3.3.8.2 Reactor Protection System (RPS) Electric Power Monitoring

LCO 3.3.8.2 Two RPS electric power monitoring assemblies shall be OPERABLE for each inservice RPS motor generator set or alternate power supply.

APPLICABILITY: MODES 1, 2, and 3,
MODES 4 and 5 [with any control rod withdrawn from a core cell containing one or more fuel assemblies].

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or both inservice power supplies with one electric power monitoring assembly inoperable.	A.1 Remove associated inservice power supply(s) from service.	72 hours
B. One or both inservice power supplies with both electric power monitoring assemblies inoperable.	B.1 Remove associated inservice power supply(s) from service.	1 hour
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 Be in MODE 3.	12 hours
	C.2 Be in MODE 4.	36 hours
D. Required Action and associated Completion Time of Condition A or B not met in MODE 4 or 5 [with any control rod withdrawn from a core cell containing one or more fuel assemblies].	D.1 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. <u>AND</u>	Immediately

BASES

ACTIONS (continued)

an event requiring RPS electric power monitoring protection occurring during this period. It allows time for plant operations personnel to take corrective actions or to place the plant in the required condition in an orderly manner and without challenging plant systems.

Alternately, if it is not desired to remove the power supply from service (e.g., as in the case where removing the power supply(s) from service would result in a scram or isolation), Condition C or D, as applicable, must be entered and its Required Actions taken.

B.1

If both power monitoring assemblies for an inservice power supply (MG set or alternate) are inoperable or both power monitoring assemblies in each inservice power supply are inoperable, the system protective function is lost. In this condition, 1 hour is allowed to restore one assembly to OPERABLE status for each inservice power supply. If one inoperable assembly for each inservice power supply cannot be restored to OPERABLE status, the associated power supply(s) must be removed from service within 1 hour (Required Action B.1). An alternate power supply with OPERABLE assemblies may then be used to power one RPS bus. The 1 hour Completion Time is sufficient for the plant operations personnel to take corrective actions and is acceptable because it minimizes risk while allowing time for restoration or removal from service of the electric power monitoring assemblies.

Alternately, if it is not desired to remove the power supply(s) from service (e.g., as in the case where removing the power supply(s) from service would result in a scram or isolation), Condition C or D, as applicable, must be entered and its Required Actions taken.

C.1 (and C.2)

If any Required Action and associated Completion Time of Condition A or B are not met in MODE 1, 2, or 3, a plant shutdown must be performed. This places the plant in a condition where minimal equipment, powered through the inoperable RPS electric power monitoring assembly(s), is required and ensures that the safety function of the RPS (e.g., scram of control rods) is not required. The plant shutdown is accomplished by placing the plant in 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 is

the plant must be brought to a MODE in which overall plant risk is minimized

Insert 1

BASES

SURVEILLANCE REQUIREMENTS (continued)

indicate an outage of sufficient duration to allow for scheduling and proper performance of the Surveillance.

The 184 day Frequency and the Note in the Surveillance are based on guidance provided in Generic Letter 91-09 (Ref. 2).

③

SR 3.3.8.2.2

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.8.2.3

Performance of a system functional test demonstrates that, with a required system actuation (simulated or actual) signal, the logic of the system will automatically trip open the associated power monitoring assembly. Only one signal per power monitoring assembly is required to be tested. This Surveillance overlaps with the CHANNEL CALIBRATION to provide complete testing of the safety function. The system functional test of the Class 1E circuit breakers is included as part of this test to provide complete testing of the safety function. If the breakers are incapable of operating, the associated electric power monitoring assembly would be inoperable.

The 18 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 that these components usually pass the Surveillance when performed at the 18 month Frequency.

REFERENCES

1. FSAR, Section [8.3.1.1.4.B].

← Insert 2

BASES

REFERENCES (continued)

3. NRC Generic Letter 91-09, "Modification of Surveillance Interval for the Electrical Protective Assemblies in Power Supplies for the Reactor Protection System."
-

BWR/4 LCO 3.4.3 Safety / 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. 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

C.1 and C.2

If [three] or more [required] S/RVs are inoperable, a transient may result in the violation of the ASME Code limit on reactor pressure. 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.

INSERT 3

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

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.3 Safety/Relief Valves (S/RVs)

LCO 3.4.3 The safety function of [11] S/RVs shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. [One [or two] [required] S/RV[s] inoperable.	A.1 Restore the [required] S/RV[s] to OPERABLE status.	14 days]
B. [Required Action and associated Completion Time of Condition A not met.] OR	B.1 Be in MODE 3.	12 hours
	B.2 Be in MODE 4.	36 hours
C. [Three] or more [required] S/RVs inoperable.	C.1 Be in MODE 3,	12 hours
	<u>AND</u> C.2 Be in MODE 4,	36 hours

BASES

ACTIONS

[A.1

With the safety function of one [or two] [required] S/RV[s] inoperable, the remaining OPERABLE S/RVs are capable of providing the necessary overpressure protection. Because of additional design margin, the ASME Code limits for the RCPB can also be satisfied with two S/RVs inoperable. However, the overall reliability of the pressure relief system is reduced because additional failures in the remaining OPERABLE S/RVs 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 S/RVs to OPERABLE status is based on the relief capability of the remaining S/RVs, the low probability of an event requiring S/RV actuation, and a reasonable time to complete the Required Action.]

B.1 and B.2

With less than the minimum number of required S/RVs OPERABLE a transient may result in the violation of the ASME Code limit on reactor pressure. If the safety function of the inoperable required S/RVs cannot be restored to OPERABLE status within the associated Completion Time of Required Action A.1, or if the safety function of three or more [required] S/RVs 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.

overall plant risk is minimized

Insert 1

Insert 2

SURVEILLANCE REQUIREMENTS

SR 3.4.3.1

This Surveillance requires that the [required] S/RVs will open at the pressures assumed in the safety analysis of Reference 1. The demonstration of the S/RV safe 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 S/RV setpoint is ± [3]% for OPERABILITY; however, the valves are reset to ± 1% during the Surveillance to allow for drift. [A Note is provided to allow up to [two] of the required [11] S/RVs to be physically replaced with S/RVs with lower setpoints. This provides operational flexibility which maintains the assumptions in the over-pressure analysis.]

BASES

SURVEILLANCE REQUIREMENTS (continued)

The 18 month Frequency was selected because this Surveillance must be performed during shutdown conditions and is based on the time between refuelings.

SR 3.4.3.2

A manual actuation of each [required] S/RV is performed to verify that, mechanically, the valve is functioning properly and no blockage exists in the valve discharge line. This can be demonstrated by the response of the turbine control valves or bypass valves, by a change in the measured steam flow, or by any other method suitable to verify steam flow.

Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve. Also, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the S/RVs divert steam flow upon opening. Sufficient time is therefore allowed after the required pressure and flow are achieved to perform this test. Adequate pressure at which this test is to be performed is [920] psig (the pressure recommended by the valve manufacturer). Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow $\geq 10^6$ lb/hr]. Plant startup is allowed prior to performing this test because valve OPERABILITY and the setpoints for overpressure protection are verified, per ASME Code requirements, prior to valve installation. Therefore, this SR is modified by a Note that states the Surveillance is not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. The 12 hours allowed for manual actuation after the required pressure is reached is sufficient to achieve stable conditions for testing and provides a reasonable time to complete the SR. If a valve fails to actuate due only to the failure of the solenoid but is capable of opening on overpressure, the safety function of the S/RV is considered OPERABLE.

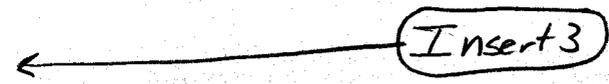
The [18] month on a STAGGERED TEST BASIS Frequency ensures that each solenoid for each S/RV is alternately tested. The 18 month Frequency was developed based on the S/RV tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. ④). Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

BASES

REFERENCES

1. FSAR, Section [5.2.2.2.4].
2. FSAR, Section [15].
- ~~4~~. ASME, Boiler and Pressure Vessel Code, Section XI.

Insert 3



BWR/4 LCO 3.5.1 ECCS - 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. 13) 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

H.1 and H.2

If two or more ADS valves are inoperable, there is a reduction in the depressurization capability. 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 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

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

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

3.5.1 ECCS - Operating

LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of [seven] safety/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

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One low pressure ECCS injection/spray subsystem inoperable.</p> <p><u>OR</u></p> <p>One LPCI pump in both LPCI subsystems inoperable.</p>	<p>A.1 Restore low pressure ECCS injection/spray subsystem(s) to OPERABLE status.</p>	7 days
<p>B. Required Action and associated Completion Time of Condition A not met.</p>	<p>B.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>B.2 Be in MODE 4.</p>	<p>12 hours</p> <p>36 hours</p>
<p>C. HPCI System inoperable.</p>	<p>C.1 Verify by administrative means RCIC System is OPERABLE.</p> <p><u>AND</u></p> <p>C.2 Restore HPCI System to OPERABLE status.</p>	<p>Immediately</p> <p>14 days</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. HPCI System inoperable. <u>AND</u> Condition A entered.	D.1 Restore HPCI System to OPERABLE status. <u>OR</u> D.2 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours 72 hours
E. One ADS valve inoperable.	E.1 Restore ADS valve to OPERABLE status.	14 days
F. One ADS valve inoperable. <u>AND</u> Condition A entered.	F.1 Restore ADS valve to OPERABLE status. <u>OR</u> F.2 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours 72 hours
H G Two or more ADS valves inoperable. <u>OR</u> Required Action and associated Completion Time of Condition C, D, E, or F not met.	G .1 Be in MODE 3. <u>H</u> <u>AND</u> G .2 Reduce reactor steam dome pressure to ≤ [150] psig. <u>H</u>	12 hours 36 hours

G. Required Action and associated Completion Time of Condition C, D, E, or F not met. | *G.1 Be in MODE 3.* | *12 hours*

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p><i>I</i> HA Two or more low pressure ECCS injection/spray subsystems inoperable for reasons other than Condition A.</p> <p><u>OR</u></p> <p>HPCI System and one or more ADS valves inoperable.</p>	<p>HA1 <i>I.</i></p> <p>Enter LCO 3.0.3.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.5.1.1 Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.</p>	<p>31 days</p>
<p>SR 3.5.1.2 ----- <p style="text-align: center;">- NOTE -</p> <p>Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than [the Residual Heat Removal (RHR) cut in permissive pressure] in MODE 3, if capable of being manually realigned and not otherwise inoperable.</p> <p>-----</p> <p>Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.</p> </p>	<p>31 days</p>
<p>SR 3.5.1.3 Verify ADS [air supply header] pressure is ≥ [90] psig.</p>	<p>31 days</p>

BASES

ACTIONS (continued)

B.1 and B.2

Overall plant risk is minimized

If the inoperable low pressure ECCS subsystem cannot be restored to OPERABLE status within the associated 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~~ ^{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 1

C.1 and C.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 immediately is therefore required 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 G must be immediately entered. If a single active component fails concurrent with a design basis LOCA, there is a potential, depending on the specific failure, that the minimum required ECCS equipment will not be available. A 14 day Completion Time is based on a reliability study cited in Reference 12 and has been found to be acceptable through operating experience.

D.1 and D.2

If any one low pressure ECCS injection/spray subsystem, or one LPCI pump in both LPCI subsystems, is inoperable in addition to an inoperable HPCI System, the inoperable low pressure ECCS injection/spray subsystem or the HPCI System must be restored to OPERABLE status within 72 hours. In this Condition, adequate core cooling is ensured by the OPERABILITY of the ADS and the remaining low pressure ECCS subsystems. However, the overall ECCS reliability is significantly reduced because a single failure in one of the remaining OPERABLE subsystems concurrent with a design basis LOCA may result in the

BASES

ACTIONS (continued)

ECCS not being able to perform its intended safety function. Since both a high pressure system (HPCI) and a low pressure subsystem are inoperable, a more restrictive Completion Time of 72 hours is required to restore either the HPCI System or the low pressure ECCS injection/spray subsystem to OPERABLE status. This Completion Time is based on a reliability study cited in Reference 12 and has been found to be acceptable through operating experience.

E.1

The LCO requires seven ADS valves to be OPERABLE in order to provide the ADS function. Reference ¹⁴13 contains the results of an analysis that evaluated the effect of one ADS valve being out of service. Per this analysis, operation of only six ADS valves will provide the required depressurization. However, 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 12 and has been found to be acceptable through operating experience.

F.1 and F.2

If any one low pressure ECCS injection/spray subsystem, or one LPCI pump in both LPCI subsystems, is inoperable in addition to one inoperable ADS valve, adequate core cooling is ensured by the OPERABILITY of HPCI and the remaining low pressure ECCS injection/spray subsystem. However, overall ECCS reliability is reduced because a single active component failure concurrent with a design basis LOCA could result in the minimum required ECCS equipment not being available. Since both a high pressure system (ADS) and a low pressure subsystem are inoperable, a more restrictive Completion Time of 72 hours is required to restore either the low pressure ECCS subsystem or the ADS valve to OPERABLE status. This Completion Time is based on a reliability study cited in Reference 12 and has been found to be acceptable through operating experience.

G.1 and G.2

If any Required Action and associated Completion Time of Condition C, D, E, or F is not met, or if two or more 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

Overall plant risk is minimized

MDOE

BASES

ACTIONS (continued)

Insert 1 12 hours and reactor steam dome pressure reduced to ≤ 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.

Insert 2

I H.1

I When multiple ECCS subsystems are inoperable, as stated in Condition H, 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.

SR 3.5.1.2

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position since these 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 cannot be inadvertently misaligned, such as check valves. For the HPCI System, this SR also includes the steam flow path for the turbine and the flow controller position.

The 31 day Frequency of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of 31 days is further justified because the

BASES

REFERENCES

1. FSAR, Section [6.3.2.2.3].
2. FSAR, Section [6.3.2.2.4].
3. FSAR, Section [6.3.2.2.1].
4. FSAR, Section [6.3.2.2.2].
5. FSAR, Section [15.2.8].
6. FSAR, Section [15.6.4].
7. FSAR, Section [15.6.5].
8. 10 CFR 50, Appendix K.
9. FSAR, Section [6.3.3].
10. 10 CFR 50.46.
11. FSAR, Section [7.3.1.2.2].
12. Memorandum from R.L. Baer (NRC) to V. Stello, Jr. (NRC),
"Recommended Interim Revisions to LCOs for ECCS Components,"
December 1, 1975.

Insert 3

14

13

FSAR, Section [6.3.3.3].

BWR/4 LCO 3.5.3, RCIC System RPS

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.

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

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

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
	<u>AND</u>	
	B.2 Reduce reactor steam dome pressure to ≤ [150] psig.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	31 days

BASES

ACTIONS (continued)

demonstrate the OPERABILITY of the HPCI System. If the OPERABILITY of the HPCI System cannot be verified, however, Condition B must be immediately entered. For transients and certain abnormal events with no LOCA, RCIC (as opposed to HPCI) is the preferred source of makeup coolant because of its relatively small capacity, which allows easier control of the RPV water level. Therefore, a limited time is allowed to restore the inoperable RCIC to OPERABLE status.

The 14 day Completion Time is based on a reliability study (Ref. 3) 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 allowed outage times (AOTs). Because of similar functions of HPCI and RCIC, the AOTs (i.e., Completion Times) determined for HPCI are also applied to RCIC.

B.1 and B.2

Overall plant risk is minimized

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 \leq [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. Insert 1

is

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

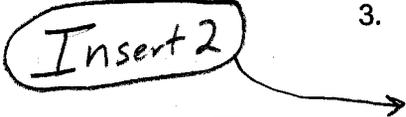
The flow path piping has the potential to develop voids and pockets of entrained air. Maintaining the pump discharge line of the RCIC System full of water ensures that the system will perform properly, injecting its full capacity into the Reactor Coolant System upon demand. This will also prevent a water 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.

BASES

REFERENCES

1. 10 CFR 50, Appendix A, GDC 33.
2. FSAR, Section [5.5.6].
3. Memorandum from R.L. Baer (NRC) to V. Stello, Jr. (NRC),
"Recommended Interim Revisions to LCOs for ECCS Components,"
December 1, 1975.

Insert 2



BWR/4 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.

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
	B.2 Be in MODE 4.	36 hours

Note: A handwritten 'AND' with a line pointing to the B.1 and B.2 rows is present in the original document. The B.2 row and its completion time are circled and crossed out.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.1.1 Perform required visual examinations and leakage rate testing except for primary containment air lock testing, in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program

BASES

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

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 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

SURVEILLANCE
REQUIREMENTS

SR 3.6.1.1.1

Maintaining the primary containment OPERABLE requires compliance with the visual examinations and leakage rate test requirements of the Primary Containment Leakage Rate Testing Program. Failure to meet air lock leakage testing (SR 3.6.1.2.1), [secondary containment bypass leakage (SR 3.6.1.3.12),] [resilient seal primary containment purge valve leakage testing (SR 3.6.1.3.7),] or main steam isolation valve leakage (SR 3.6.1.3.13) does not necessarily result in a failure of this SR. The impact of the failure to meet these SRs must be evaluated against the Type A, B, and C acceptance criteria of the Primary Containment Leakage Rate Testing Program. As left leakage prior to the first startup after performing a required Primary Containment Leakage Rate Testing Program leakage test is required to be $< 0.6 L_a$ for combined Type B and C leakage, and $[< 0.75 L_a \text{ for Option A}] [\leq 0.75 L_a \text{ for Option B}]$ for overall Type A leakage. At all other times between required leakage rate tests, the acceptance criteria is based on an overall Type A leakage limit of $\leq 1.0 L_a$. At $\leq 1.0 L_a$ the offsite dose consequences are bounded by the assumptions of the safety analysis. The Frequency is required by the Primary Containment Leakage Rate Testing Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

- REVIEWER'S NOTE -

Regulatory Guide 1.163 and NEI 94-01 include acceptance criteria for as-left and as-found Type A leakage rates and combined Type B and C leakage rates, which may be reflected in the Bases.

SR 3.6.1.1.2

Maintaining the pressure suppression function of primary containment requires limiting the leakage from the drywell to the suppression chamber. Thus, if an event were to occur that pressurized the drywell, the steam would be directed through the downcomers into the suppression pool. This SR measures drywell to suppression chamber differential pressure during a [10] minute period to ensure that the leakage paths that would bypass the suppression pool are within allowable limits.

Satisfactory performance of this SR can be achieved by establishing a known differential pressure between the drywell and the suppression chamber and verifying that the pressure in either the suppression chamber or the drywell does not change by more than [0.25] inch of water per minute over a 10 minute period. The leakage test is performed every [18 months]. The [18 month] Frequency was developed considering it is prudent that this Surveillance be performed during a unit outage and also in view of the 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, as the Note indicates, increasing the Frequency to once every [9 months] is required until the situation is remedied as evidenced by passing two consecutive tests.

REFERENCES

1. FSAR, Section [6.2].
2. FSAR, Section [15.1.39].
3. 10 CFR 50, Appendix J, Option [A][B].

Insert 2

BWR/4 LCO 3.6.1.6 Low-Low Set 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 or more LLS valves are inoperable, there could be excessive short duration S/RV cycling during an overpressure event. 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 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.

3.6 CONTAINMENT SYSTEMS

3.6.1.6 Low-Low Set (LLS) Valves

LCO 3.6.1.6 The LLS function of [four] safety/relief valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.6.1 ----- <p style="text-align: center;">- NOTE -</p> Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ----- Verify each LLS valve opens when manually actuated.	[18] months [on a STAGGERED TEST BASIS for each valve solenoid]

BASES

LCO [Four] LLS valves are required to be OPERABLE to satisfy the assumptions of the safety analyses (Ref. 1). The requirements of this LCO are applicable to the mechanical and electrical/pneumatic capability of the LLS valves to function for controlling the opening and closing of the S/RVs.

APPLICABILITY In MODES 1, 2, and 3, an event could cause pressurization of the reactor and opening of S/RVs. 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 LLS valves OPERABLE is not required in MODE 4 or 5.

ACTIONS A.1

With one LLS valve inoperable, the remaining OPERABLE LLS valves are adequate to perform the designed function. However, the overall reliability is reduced. The 14 day Completion Time takes into account the redundant capability afforded by the remaining LLS valves and the low probability of an event in which the remaining LLS valve capability would be inadequate.

B.1 and B.2

If an

Overall plant risk is minimized

If ~~two or more LLS valves are inoperable or if the~~ inoperable LLS 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~~ 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

is

Insert 2

SURVEILLANCE REQUIREMENTS SR 3.6.1.6.1

A manual actuation of each LLS valve is performed to verify that the valve and solenoids are functioning properly and no blockage exists in the valve discharge line. This can be demonstrated by the response of the turbine control or bypass valve, by a change in the measured steam flow, or by any other method that is suitable to verify steam flow. Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve. Adequate pressure at which this test is to be performed is \geq [920] psig (the pressure recommended by the valve manufacturer). Also, adequate steam flow must be passing through the

BASES

SURVEILLANCE REQUIREMENTS (continued)

main turbine or turbine bypass valves to continue to control reactor pressure when the LLS valves divert steam flow upon opening. Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow $\geq 10^6$ lb/hr]. The [18] month Frequency was based on the S/RV tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. ②). The Frequency of 18 months on a STAGGERED TEST BASIS ensures that each solenoid for each S/RV is alternately tested. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

Since steam pressure is required to perform the Surveillance, however, and steam may not be available during a unit outage, the Surveillance may be performed during the startup following a unit outage. Unit startup is allowed prior to performing the test because valve OPERABILITY and the setpoints for overpressure protection are verified by Reference ② prior to valve installation. After adequate reactor steam dome pressure and flow are reached, 12 hours is allowed to prepare for and perform the test.

SR 3.6.1.6.2

The LLS designated S/RVs 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 LLS function operate as designed when initiated either by an actual or simulated automatic initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.3.7 overlaps this SR to provide complete testing of the safety function.

The 18 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 18 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.

BASES

REFERENCES

1. FSAR, Section [5.5.17].

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

Insert 3

BWR/4 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. 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.

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.

3.6 CONTAINMENT SYSTEMS

3.6.1.7 Reactor Building-to-Suppression Chamber Vacuum Breakers

LCO 3.6.1.7 Each reactor building-to-suppression chamber vacuum breaker shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

- NOTE -

Separate Condition entry is allowed for each line.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more lines with one reactor building-to-suppression chamber vacuum breaker not closed.	A.1 Close the open vacuum breaker.	72 hours
B. One or more lines with two reactor building-to-suppression chamber vacuum breakers not closed.	B.1 Close one open vacuum breaker.	1 hour
C. One line with one or more reactor building-to-suppression chamber vacuum breakers inoperable for opening.	C.1 Restore the vacuum breaker(s) to OPERABLE status.	72 hours
E D Two [or more] lines with one or more reactor building-to-suppression chamber vacuum breakers inoperable for opening.	D .1 E Restore all vacuum breakers in [one] line to OPERABLE status.	1 hour

<p><i>D. Required Action and Associated Completion Time of Condition C not met.</i></p>	<p><i>D.1 Be in MODE 3.</i></p>	<p><i>12 hours</i></p>
---	---------------------------------	------------------------

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
(F) (E) Required Action and Associated Completion Time not met. of Conditions A, B, or E	(E)1 (F) Be in MODE 3.	12 hours
	AND (E)2 (F) Be in MODE 4.	36 hours

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
SR 3.6.1.7.3 Verify the opening setpoint of each vacuum breaker is \leq [0.5] psid.	[18] months

BASES

ACTIONS (continued)

consistent with requirements for inoperable suppression-chamber-to-drywell vacuum breakers in LCO 3.6.1.8, "Suppression-Chamber-to-Drywell Vacuum Breakers." The 72 hour Completion Time takes into account the redundancy capability afforded by the remaining breakers, the fact that the OPERABLE breaker in each of the lines is closed, and the low probability of an event occurring that would require the vacuum breakers to be OPERABLE during this period.

B.1

With one or more lines with two vacuum breakers not closed, primary containment integrity is not maintained. Therefore, one open vacuum breaker must be closed within 1 hour. This Completion Time is consistent with the ACTIONS of LCO 3.6.1.1, "Primary Containment," which requires that primary containment be restored to OPERABLE status within 1 hour.

C.1

With one line with one or more vacuum breakers inoperable for opening, the leak tight primary containment boundary is intact. The ability to mitigate an event that causes a containment depressurization is threatened, however, if both vacuum breakers in at least one vacuum breaker penetration are not OPERABLE. Therefore, the inoperable vacuum breaker must be restored to OPERABLE status within 72 hours. 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 [or more] 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) → A.1 and A.2 → (E)

or more lines

If ~~all~~ the vacuum breakers in [one] ~~line~~ cannot be closed or 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

power. For this unit, the [18] 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.

REFERENCES

1. FSAR, Section [6.2].
-

Insert 2

BWR/4 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. 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.

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.

3.6 CONTAINMENT SYSTEMS

3.6.1.8 Suppression Chamber-to-Drywell Vacuum Breakers

LCO 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, except when performing their intended function.

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
ⓐ. One suppression chamber-to-drywell vacuum breaker not closed.	ⓑ.1 Close the open vacuum breaker.	2 hours
ⓐ. Required Action and associated Completion Time not met. of Condition C	ⓐ.1 Be in MODE 3.	12 hours
	AND ⓐ.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

BASES

ACTIONS (continued)

① → ①.1

Insert 1

An open vacuum breaker allows communication between the drywell and suppression chamber airspace, and, as a result, there is the potential for suppression chamber 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 2 hour Completion Time is considered adequate to perform this test.

①.1 and ①.2
① → open

If the ~~inoperable~~ suppression chamber-to-drywell vacuum breaker cannot be closed ~~or 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.

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 without makeup. 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. This verification is also required within 2 hours after any discharge of steam to the suppression chamber from the safety/relief valves or any operation that causes the drywell-to-suppression chamber differential pressure to be reduced by \geq [0.5] psid.

A Note is added to this SR which 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

opening vacuum breakers are controlled by plant procedures and do not represent inoperable vacuum breakers.

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, since they are located in a harsh environment (the suppression chamber airspace). In addition, this functional test is required within 12 hours after either a discharge of steam to the suppression chamber from the safety/relief valves or after an operation that causes any of the vacuum breakers to open.

SR 3.6.1.8.3

Verification of the vacuum breaker opening setpoint is necessary to ensure that the safety analysis assumption regarding vacuum breaker full open differential pressure of [0.5] psid is valid. The [18] 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 facility, the [18] 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.

REFERENCES

1. FSAR, Section [6.2].

Insert 2

BWR/4 LCO 3.6.1.9 MSIV LCS

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.

3.6 CONTAINMENT SYSTEMS

3.6.1.9 Main Steam Isolation Valve (MSIV) Leakage Control System (LCS)

LCO 3.6.1.9 Two MSIV LCS subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One MSIV LCS subsystem inoperable.	A.1 Restore MSIV LCS subsystem to OPERABLE status.	30 days
B. Two MSIV LCS subsystems inoperable.	B.1 Restore one MSIV LCS subsystem to OPERABLE status.	7 days
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	12 hours
	<u>AND</u> C.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.9.1 Operate each MSIV LCS blower \geq [15] minutes.	31 days
SR 3.6.1.9.2 Verify electrical continuity of each inboard MSIV LCS subsystem heater element circuitry.	31 days
SR 3.6.1.9.3 Perform a system functional test of each MSIV LCS subsystem.	[18] months

BASES

APPLICABILITY In MODES 1, 2, and 3, a DBA could lead to a fission product release to primary containment. Therefore, MSIV LCS 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 MSIV LCS OPERABLE is not required in MODE 4 or 5 to ensure MSIV leakage is processed.

ACTIONS

A.1

With one MSIV LCS subsystem inoperable, the inoperable MSIV LCS subsystem must be restored to OPERABLE status within 30 days. In this Condition, the remaining OPERABLE MSIV LCS subsystem is adequate to perform the required leakage control function. However, the overall reliability is reduced because a single failure in the remaining subsystem could result in a total loss of MSIV leakage control function. The 30 day Completion Time is based on the redundant capability afforded by the remaining OPERABLE MSIV LCS subsystem and the low probability of a DBA LOCA occurring during this period.

B.1

With two MSIV LCS subsystems inoperable, at least one subsystem must be restored to OPERABLE status within 7 days. The 7 day Completion Time is based on the low probability of the occurrence of a DBA LOCA.

C.1 and C.2

Overall plant risk is minimized

If the MSIV LCS subsystem 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

SURVEILLANCE
REQUIREMENTS

SR 3.6.1.9.1

Each MSIV LCS blower is operated for \geq [15] minutes to verify OPERABILITY. The 31 day Frequency was developed considering the known reliability of the LCS blower and controls, the two subsystem redundancy, and the low probability of a significant degradation of the

BASES

SURVEILLANCE REQUIREMENTS (continued)

MSIV LCS subsystems occurring between surveillances and has been shown to be acceptable through operating experience.

SR 3.6.1.9.2

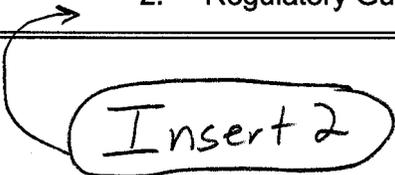
The electrical continuity of each inboard MSIV LCS subsystem heater is verified by a resistance check, by verifying that the rate of temperature increase meets specifications, or by verifying that the current or wattage draw meets specifications. The 31 day Frequency is based on operating experience that has shown that these components usually pass this Surveillance when performed at this Frequency.

SR 3.6.1.9.3

A system functional test is performed to ensure that the MSIV LCS will operate through its operating sequence. This includes verifying that the automatic positioning of the valves and the operation of each interlock and timer are correct, that the blowers start and develop the required flow rate and the necessary vacuum, and that the upstream heaters meet current or wattage draw requirements (if not used to verify electrical continuity in SR 3.6.1.9.2). The [18] 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 that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [6.5].
2. Regulatory Guide 1.96, Revision [1].



Insert 2

BWR/4 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.

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.

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
ⓐ. Two RHR suppression pool cooling subsystems inoperable.	ⓑ.1 Restore one RHR suppression pool cooling subsystem to OPERABLE status.	8 hours
ⓐ. Required Action and associated Completion Time not met. <u>of Condition C</u>	ⓐ.1 Be in MODE 3.	12 hours
	ⓐ.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.2.3.1 Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic 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.	31 days

B. Required Action and associated Completion Time of Condition A Not met. | B.1 Be in MODE 3. | 12 hours

BASES

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 a release of radioactive material to primary containment and cause 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.

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 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.

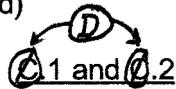
Insert 1

① → 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.

BASES

ACTIONS (continued)



of Condition C

If the 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.

SURVEILLANCE
REQUIREMENTS

SR 3.6.2.3.1

Verifying the correct alignment for manual, power operated, and automatic 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.

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 subsystem 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 RHR pump develops a flow rate \geq [7700] gpm while operating in the suppression pool cooling mode with flow through the associated heat exchanger ensures that pump performance has not degraded during the cycle. 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 inspections confirm component OPERABILITY, trend performance, and detect incipient

BASES

SURVEILLANCE REQUIREMENTS (continued)

failures by indicating abnormal performance. The Frequency of this SR is [in accordance with the Inservice Testing Program or 92 days].

REFERENCES

1. FSAR, Section [6.2].

③④

ASME, Boiler and Pressure Vessel Code, Section XI.

Insert 2

BWR/4 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.

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. <u>AND</u> C.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.2.4.1 Verify each RHR suppression pool spray subsystem manual, power operated, and automatic 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.	31 days

BASES

ACTIONS (continued)

low probability of a DBA and because alternative methods to remove heat from primary containment are available.

C.1 ~~and C.2~~

Overall plant risk is minimized

(S)

If the inoperable RHR suppression pool spray subsystem cannot be restored to OPERABLE status within the associated 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 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

(S)

SURVEILLANCE
REQUIREMENTS

SR 3.6.2.4.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR suppression pool spray mode flow path provides assurance that the proper flow paths will exist 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.

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 subsystem is a manually initiated system. This Frequency has been shown to be acceptable based on operating experience.

SR 3.6.2.4.2

Verifying each RHR pump develops a flow rate \geq [400] gpm while operating in the suppression pool spray mode with flow through the heat exchanger ensures that pump performance has not degraded during the cycle. Flow is a normal test of centrifugal pump performance required by

BASES

SURVEILLANCE REQUIREMENTS (continued)

Section XI of the ASME Code (Ref. ^③2). This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. The Frequency of this SR is [in accordance with the Inservice Testing Program, but the Frequency must not exceed 92 days].

REFERENCES

1. FSAR, Section [6.2].
 - ^③2 ASME, Boiler and Pressure Vessel Code, Section XI.
-

Insert 2

BWR/4 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. 3), 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.

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
	B.2 Be in MODE 4.	36 hours
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
	<u>AND</u> C.2 Initiate action to suspend OPDRVs.	Immediately

BASES

APPLICABILITY (continued)

-During fuel handling/core alterations, ventilation system and radiation monitor availability (as defined in NUMARC 91-06) should be assessed, with respect to filtration and monitoring of releases from the fuel. Following shutdown, radioactivity in the fuel decays away fairly rapidly. The basis of the Technical Specification operability amendment is the reduction in doses due to such decay. The goal of maintaining ventilation system and radiation monitor availability is to reduce doses even further below that provided by the natural decay.

-A single normal or contingency method to promptly close primary or secondary containment penetrations should be developed. Such prompt methods need not completely block the penetration or be capable of resisting pressure.

The purpose of the "prompt methods" mentioned above are to enable ventilation systems to draw the release from a postulated fuel handling accident in the proper direction such that it can be treated and monitored."

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)

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 (is) 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

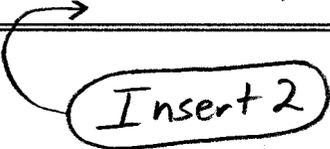
BASES

SURVEILLANCE REQUIREMENTS (continued)

[secondary] containment boundary integrity. The secondary purpose of these SR[s] is to ensure that the SGT subsystem being tested functions as designed. There is a separate LCO with Surveillance Requirements which serves the primary purpose of ensuring OPERABILITY of the SGT System. These SR[s] need not be performed with each SGT subsystem. The SGT subsystem used for these Surveillance[s] is staggered to ensure that in 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 these Surveillance[s] relative to the [secondary] containment OPERABILITY. Operating experience has shown the [secondary] containment boundary usually passes these Surveillance[s] when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [15.1.39].
2. FSAR, Section [15.1.41].



Insert 2

BWR/4 LCO 3.6.4.3 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. 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

Therefore, 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. 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 3

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

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
	B.2 Be in MODE 4.	36 hours
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. -----	
	C.1 Place OPERABLE SGT subsystem in operation.	Immediately
	<u>OR</u> C.2.1 Suspend movement of [recently] irradiated fuel assemblies in [secondary] containment.	Immediately
	<u>AND</u>	

BASES

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)

Overall plant risk is minimized

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 36 hours~~. The allowed Completion Times ~~are~~ reasonable, based ~~is~~ 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, 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 have occurred, 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 these activities 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.

BASES

ACTIONS (continued)

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 radioactivity release control function. ~~Therefore, actions are required to enter~~

Insert 2

LCO 3.0.3 immediately.

E.1 and E.2

When two SGT subsystems are inoperable, if applicable, movement of [recently] irradiated fuel assemblies in [secondary] containment must immediately be suspended. Suspension of these activities shall 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.

Required Action E.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.

SURVEILLANCE
REQUIREMENTS

SR 3.6.4.3.1

Operating each SGT subsystem for \geq [10] continuous hours ensures that [both] subsystems are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. Operation [with the heaters on (automatic heater cycling to maintain temperature)]

BASES

SURVEILLANCE REQUIREMENTS (continued)

for \geq [10] continuous hours every 31 days eliminates moisture on the adsorbers and HEPA filters. The 31 day Frequency was developed in consideration of the known reliability of fan motors and controls and the redundancy available in the system.

SR 3.6.4.3.2

This SR verifies that the required SGT filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorber efficiency, minimum 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.

SR 3.6.4.3.3

This SR verifies that each SGT subsystem starts on receipt of an actual or simulated initiation signal. While this Surveillance can be performed with the reactor at power, operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.2.6 overlaps this SR to provide complete testing of the safety function. Therefore, the Frequency was found to be acceptable from a reliability standpoint.

[SR 3.6.4.3.4

This SR verifies that the filter cooler bypass damper can be opened and the fan started. This ensures that the ventilation mode of SGT System operation is available. While this Surveillance can be performed with the reactor at power, operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency, which is based on the refueling cycle. Therefore, the Frequency was found to be acceptable from a reliability standpoint.]

REFERENCES

1. 10 CFR 50, Appendix A, GDC 41.
2. FSAR, Section [6.2.3].

Insert 3

BWR/4 LCO 3.7.1 RHRSW 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.

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 3.4.8, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown," for [RHR shutdown cooling] made inoperable by RHRSW System. ----- Restore RHRSW subsystem to OPERABLE status.	7 days

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>⓪ E Both RHRSW subsystems inoperable for reasons other than Condition B.</p>	<p>⓪ 1 E</p> <p>----- NOTE - Enter applicable Conditions and Required Actions of LCO 3.4.8 for [RHR shutdown cooling] made inoperable by RHRSW System. -----</p> <p>Restore one RHRSW subsystem to OPERABLE status.</p>	<p>[8] hours</p>
<p>⓪ F Required Action and associated Completion Time not met. <i>of Condition E</i></p>	<p>⓪ 1 AND ⓪ ⓪ 2</p> <p>Be in MODE 3.</p> <p>Be in MODE 4.</p>	<p>12 hours</p> <p>36 hours</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.7.1.1 Verify each RHRSW manual, power operated, and automatic 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>

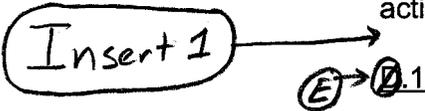
BASES

ACTIONS (continued)

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 3.4.8, be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable [RHR shutdown cooling]. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.



With both RHRSW 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 RHRSW 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 RHRSW 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 3.4.8, be entered and Required Actions taken if the inoperable RHRSW subsystem results in inoperable [RHR shutdown cooling]. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.



If the RHRSW subsystems cannot be restored to OPERABLE status within the associated Completion Times, 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

BASES

ACTIONS (continued)

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, power operated, and automatic valve in each RHRSW subsystem flow path provides assurance that the proper flow paths will exist for RHRSW 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 considered in the correct position, provided it can be realigned to its accident position. This is acceptable because the RHRSW 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.

REFERENCES

1. FSAR, Section [9.2.7].
 2. FSAR, Chapter [6].
 3. FSAR, Chapter [15].
 4. FSAR, Section [6.2.1.4.3].
-

Insert 2

BWR/4 LCO 3.7.2 PSW System and UHS**INSERT 1****C.1**

If one PSW pump in one or both subsystems is inoperable and is not restored to OPERABLE status within the required Completion Times, 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.

3.7 PLANT SYSTEMS

3.7.2 [Plant Service Water (PSW)] System and [Ultimate Heat Sink (UHS)]

LCO 3.7.2 Two [PSW] subsystems and [UHS] shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One [PSW] pump inoperable.	A.1 Restore [PSW] pump to OPERABLE status.	30 days
B. One [PSW] pump in each subsystem inoperable.	B.1 Restore one [PSW] pump to OPERABLE status.	7 days
D G [One or more cooling towers with one cooling tower fan inoperable.	D .1 D Restore cooling tower fan(s) to OPERABLE status.	7 days]
----- - REVIEWER'S NOTE - The []°F is the maximum allowed UHS temperature value and is based on temperature limitations of the equipment that is relied upon for accident mitigation and safe shutdown of the unit. -----	D .1 E Verify water temperature of the UHS is \leq [90]°F averaged over the previous 24 hour period.	Once per hour]
E D [Water temperature of the UHS > [90]°F and \leq []°F.		

<p>C. Required Action and associated Completion Time of Conditions A and B not met.</p>	<p>C.1 Be in MODE 3.</p>	<p>12 hours</p>
---	--------------------------	-----------------

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p> E One [PSW] subsystem inoperable for reasons other than Condition[s] A [and C]. D </p>	<p> E 1 F </p> <p style="text-align: center;">-----</p> <p style="text-align: center;">- NOTES -</p> <ol style="list-style-type: none"> 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," for diesel generator made inoperable by [PSW]. 2. Enter applicable Conditions and Required Actions of LCO 3.4.8, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown," for [RHR shutdown cooling] made inoperable by [PSW]. <p style="text-align: center;">-----</p> <p>Restore the [PSW] subsystem to OPERABLE status.</p>	<p style="text-align: center;">72 hours</p>

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p> G → E [Required Action and associated Completion Time of Condition A, B (or D) not met.] E → <u>OR</u> Both [PSW] subsystems inoperable for reasons other than Condition[s] B [and C, D] <u>[OR</u> [UHS] inoperable for reasons other than Condition C [or D.] E </p>	<p>F.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>F.2 Be in MODE 4.</p>	<p>12 hours</p> <p>36 hours</p>

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.2.1	[Verify the water level of each [PSW] cooling tower basin is \geq [] ft.	24 hours]
SR 3.7.2.2	[Verify the water level [in each PSW pump well of the intake structure] is \geq [60.1] ft [mean sea level].	24 hours]
SR 3.7.2.3	[Verify the average water temperature of [UHS] is \leq []°F.	24 hours]
SR 3.7.2.4	[Operate each [PSW] cooling tower fan for \geq [15] minutes.	31 days]

BASES

ACTIONS

A.1

With one [PSW] pump inoperable in each subsystem, the inoperable pump must be restored to OPERABLE status within 7 days. With the unit in this condition, the remaining OPERABLE [PSW] pumps (even allowing for an additional single failure) are adequate to perform the [PSW] heat removal function; however, the overall reliability is reduced. The 30 day Completion Time is based on the remaining [PSW] heat removal capability to accommodate additional single failures, and the low probability of an event occurring during this time period.

B.1

With one [PSW] pump inoperable in each subsystem, one inoperable pump must be restored to OPERABLE status within 7 days. With the unit in this condition, the remaining OPERABLE [PSW] pumps are adequate to perform the [PSW] heat removal function; however, the overall reliability is reduced. The 7 day Completion Time is based on the remaining [PSW] heat removal capability to accommodate an additional single failure and the low probability of an event occurring during this time period.

Insert 1



If one or more cooling towers have one fan inoperable (i.e., up to one fan per cooling tower inoperable), action must be taken to restore the inoperable cooling tower fan(s) to OPERABLE status within 7 days. The 7 day Completion Time is based on the low probability of an accident occurring during the 7 days that one cooling tower fan is inoperable in one or more cooling towers, the number of available systems, and the time required to reasonably complete the Required Action.]



- REVIEWER'S NOTE -

The []°F is the maximum allowed UHS temperature value and is based on temperature limitations of the equipment that is relied upon for accident mitigation and safe shutdown of the unit.

With water temperature of the UHS > [90]°F, the design basis assumption associated with initial UHS temperature are bounded provided the temperature of the UHS averaged over the previous 24 hour period is ≤ [90]°F. With the water temperature of the UHS > [90]°F, long term cooling capability of the ECCS loads and DGs may be affected.

BASES

ACTIONS (continued)

Therefore, to ensure long term cooling capability is provided to the ECCS loads when water temperature of the UHS is $> [90]^{\circ}\text{F}$, Required Action ^(E) ~~(D)~~ 1 is provided to more frequently monitor the water temperature of the UHS and verify the temperature is $\leq [90]^{\circ}\text{F}$ when averaged over the previous 24 hour period. The once per hour Completion Time takes into consideration UHS temperature variations and the increased monitoring frequency needed to ensure design basis assumptions and equipment limitations are not exceeded in this condition. If the water temperature of the UHS exceeds $[90]^{\circ}\text{F}$ when averaged over the previous 24 hour period or the water temperature of the UHS exceeds [] $^{\circ}\text{F}$, Condition F must be entered immediately.]

^(F) ~~(E)~~ 1

With one [PSW] subsystem ^(B) inoperable for reasons other than Condition A and [Condition ~~(C)~~ (e.g., inoperable flow path or both pumps inoperable in a loop)], the [PSW] subsystem must be restored to OPERABLE status within 72 hours. With the unit in this condition, the remaining OPERABLE [PSW] subsystem is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE [PSW] subsystem could result in loss of [PSW] function.

The 72 hour Completion Time is based on the redundant [PSW] System capabilities afforded by the OPERABLE subsystem, the low probability of an accident occurring during this time period, and is consistent with the allowed Completion Time for restoring an inoperable DG.

Required Action ^(F) ~~(E)~~ 1 is modified by two Notes indicating that the applicable Conditions of LCO 3.8.1, "AC Sources - Operating," LCO 3.4.8, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown," be entered and Required Actions taken if the inoperable [PSW] subsystem results in an inoperable DG or RHR shutdown cooling subsystem, respectively. This is in accordance with LCO 3.0.6 and ensures the proper actions are taken for these components.

^(G) ~~(F)~~ 1 and ~~(E)~~ 2 ^(G)

~~If the [PSW] subsystem cannot be restored to OPERABLE status within the associated Completion Time, or both [PSW] subsystems are inoperable for reasons other than Condition B and [Condition ~~(C)~~, [or the [UHS] is determined inoperable for reasons other than Condition C or ~~(D)~~ the unit must be placed in a MODE in which the LCO does not apply. To~~

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.2.5

Verifying the correct alignment for each manual, power operated, and automatic valve in each [PSW] subsystem flow path provides assurance that the proper flow paths will exist for [PSW] 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, and yet considered in the correct position, provided it can be automatically realigned to its accident position within the required time. 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.

This SR is modified by a Note indicating that isolation of the [PSW] System to components or systems may render those components or systems inoperable, but does not affect the OPERABILITY of the [PSW] System. As such, when all [PSW] pumps, valves, and piping are OPERABLE, but a branch connection off the main header is isolated, the [PSW] System is still OPERABLE.

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

SR 3.7.2.6

This SR verifies that the automatic isolation valves of the [PSW] System will automatically switch to the safety or emergency position to provide cooling water exclusively to the safety related equipment during an accident event. This is demonstrated by the use of an actual or simulated initiation signal. This SR also verifies the automatic start capability of one of the two [PSW] pumps in each subsystem.

Operating experience has shown that these components usually pass the SR when performed at the [18] month Frequency. Therefore, this Frequency is concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Chapter [4].
2. FSAR, Chapter [6].

Insert 2

BWR/4 LCO 3.7.4 MCREC 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. 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.

INSERT 2

Therefore, 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. 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 3

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

3.7 PLANT SYSTEMS

3.7.4 [Main Control Room Environmental Control (MCREC)] System

LCO 3.7.4 Two [MCREC] subsystems shall be OPERABLE.

- NOTE -

The main control room boundary may be opened intermittently under administrative control

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 [MCREC] subsystem inoperable.	A.1 Restore [MCREC] subsystem to OPERABLE status.	7 days
B. Two [MCREC] subsystems inoperable due to inoperable control room boundary in MODE 1, 2, or 3.	B.1 Restore control room boundary to OPERABLE status.	24 hours
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>D. 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.</p>	<p style="text-align: center;">----- - NOTE - LCO 3.0.3 is not applicable. -----</p>	
	<p>D.1</p> <p style="text-align: center;">----- - NOTE - [Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.] -----</p>	
	<p>Place OPERABLE [MCREC] subsystem in [pressurization] mode.</p>	<p>Immediately</p>
	<p><u>OR</u></p> <p>D.2.1 Suspend movement of [recently] irradiated fuel assemblies in the [secondary] containment.</p> <p><u>AND</u></p> <p>D.2.2 Initiate action to suspend OPDRVs.</p>	<p>Immediately</p> <p>Immediately</p>
<p>E. Two [MCREC] subsystems inoperable in MODE 1, 2, or 3 for reasons other than Condition B.</p>	<p>E.1</p> <p style="text-align: center;">Enter LCO 3.0.3. <i>Be in MODE 3.</i></p>	<p style="text-align: center;">Immediately <i>12 hours</i></p>

BASES

ACTIONS (continued)

If the main control room boundary is inoperable in MODE 1, 2, or 3, the MCREC trains cannot perform their intended functions. Actions must be taken to restore an OPERABLE main control room boundary within 24 hours. During the period that the main control room boundary is inoperable, appropriate compensatory measures (consistent with the intent of GDC 19) should be utilized to protect control room operators from potential hazards such as radioactive contamination, toxic chemicals, smoke, temperature and relative humidity, and physical security. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of compensatory measures. The 24 hour Completion Time is a typically reasonable time to diagnose, plan and possibly repair, and test most problems with the main control room boundary.

C.1 and C.2

Insert 1

Overall plant

is

In MODE 1, 2, or 3, if the inoperable [MCREC] subsystem or control room boundary 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.

D.1, D.2.1 and D.2.2

The Required Actions of Condition D 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. Therefore, inability to suspend movement of [recently] irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of [recently] irradiated fuel assemblies in the [secondary] containment or during OPDRVs, if the inoperable [MCREC] subsystem cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE [MCREC] subsystem may be placed in the pressurization mode. This action ensures that the remaining subsystem is OPERABLE, that no failures that would prevent automatic actuation will occur, and that any active failure will be readily detected.

BASES

ACTIONS (continued)

Required Action D.1 is modified by a Note alerting the operator to [place the system in the toxic gas protection mode if the toxic gas automatic transfer capability is inoperable].

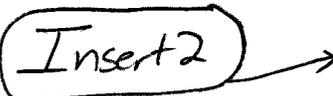
An alternative to Required Action D.1 is to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk.

If applicable, movement of [recently] 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, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and the subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

E.1

If both [MCREC] subsystems are inoperable in MODE 1, 2, or 3 for reasons other than an inoperable control room boundary (i.e., Condition B), the [MCREC] System may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

Insert 2



F.1 and F.2

The Required Actions of Condition F are modified by a Note indicating that LCO 3.0.3 does not apply. If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of [recently] irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of [recently] irradiated fuel assemblies in the [secondary] containment or during OPDRVs, with two [MCREC] subsystems inoperable, 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, movement of [recently] irradiated fuel assemblies in the [secondary] containment must be suspended immediately. Suspension

BASES

ACTIONS (continued)

of these activities shall not preclude completion of movement of a component to a safe position. If applicable, actions must be initiated immediately to suspend OPDVRs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

SURVEILLANCE
REQUIREMENTS

SR 3.7.4.1

This SR verifies that a subsystem in a standby mode starts on demand and continues to operate. 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 each subsystem once every month provides an adequate check on this system. Monthly heater operation dries out any moisture that has accumulated in the charcoal as a result of humidity in the ambient air. [Systems with heaters must be operated for ≥ 10 continuous hours with the heaters energized. Systems without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system.] Furthermore, the 31 day Frequency is based on the known reliability of the equipment and the two subsystem redundancy available.

SR 3.7.4.2

This SR verifies that the required [MCREC] testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. The [VFTP] includes testing HEPA filter performance, charcoal adsorber efficiency, minimum 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].

SR 3.7.4.3

This SR verifies that on an actual or simulated initiation signal, each [MCREC] subsystem starts and operates. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.7.1.5 overlaps this SR to provide complete testing of the safety function. The [18] month Frequency is specified in Reference ⁽⁵⁾ 6

[SR 3.7.4.4

This SR verifies the integrity of the control room enclosure and the assumed inleakage rates of potentially contaminated air. The control

BASES

SURVEILLANCE REQUIREMENTS (continued)

room positive pressure, with respect to potentially contaminated adjacent areas (the turbine building), is periodically tested to verify proper function of the [MCREC] System. During the emergency mode of operation, the [MCREC] System is designed to slightly pressurize the control room \geq [0.1] inches water gauge positive pressure with respect to the turbine building to prevent unfiltered inleakage. The [MCREC] System is designed to maintain this positive pressure at a flow rate of \leq [400] cfm to the control room in the pressurization mode. The Frequency of [18] months on a STAGGERED TEST BASIS is consistent with industry practice and other filtration systems SRs.]

REFERENCES

1. FSAR, Chapter [6].
2. FSAR, Chapter [9].
3. FSAR, Chapter [15].
4. FSAR, Section [6.4.1.2.2].
- ⑥ → ② Regulatory Guide 1.52, Rev. [2].

Insert 3 →

BWR/4 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. 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

Therefore, 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. 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.

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.

3.7 PLANT SYSTEMS

3.7.5 [Control Room Air Conditioning (AC)] System

LCO 3.7.5 Two [control room AC] 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 [control room AC] subsystem inoperable.	A.1 Restore [control room AC] subsystem 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
	<u>AND</u> B.2 Be in MODE 4.	36 hours
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. -----	
	C.1 Place OPERABLE [control room AC] subsystem in operation. <u>OR</u>	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>C.2.1 Suspend movement of [recently] irradiated fuel assemblies in the [secondary] containment.</p> <p><u>AND</u></p> <p>C.2.2 Initiate action to suspend OPDRVs.</p>	<p>Immediately</p> <p>Immediately</p>
D. Two [control room AC] subsystems inoperable in MODE 1, 2, or 3.	<p>D.1 Enter LCO 3.0.3. <i>Be in MODE 3.</i></p>	<p>Immediately <i>12 hours</i></p>
E. Two [control room AC] subsystems inoperable during movement of [recently] irradiated fuel assemblies in the [secondary] containment or during OPDRVs.	<p>----- - NOTE - LCO 3.0.3 is not applicable. -----</p> <p>E.1 Suspend movement of [recently] irradiated fuel assemblies in the [secondary] containment.</p> <p><u>AND</u></p> <p>E.2 Initiate actions to suspend OPDRVs.</p>	<p>Immediately</p> <p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.5.1 Verify each [control room AC] subsystem has the capability to remove the assumed heat load.	[18] months

BASES

ACTIONS (continued)

B.1 ~~and B.2~~

overall plant

In MODE 1, 2, or 3, if the inoperable [control room AC] subsystem 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.

Insert 1

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

The Required Actions of Condition C are modified by a Note indicating that LCO 3.0.3 does not apply. If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of [recently] irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of [recently] irradiated fuel assemblies in the [secondary] containment or during OPDRVs, if Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE [control room AC] subsystem may be placed immediately in operation. This action ensures that the remaining subsystem is OPERABLE, that no failures that would prevent actuation will occur, and that any active failure will be readily detected.

An alternative to Required Action C.1 is to immediately 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, movement of [recently] 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, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

BASES

ACTIONS (continued)

D.1

If both [control room AC] subsystems are inoperable in MODE 1, 2, or 3, the [Control Room AC] System may not be capable of performing the intended function. Therefore, LCO 3.0.3 must be entered immediately.

E.1 and E.2

Insert 2

The Required Actions of Condition E are modified by a Note indicating that LCO 3.0.3 does not apply. If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of [recently] irradiated fuel assemblies is not a sufficient reason to require a reactor shutdown.

During movement of [recently] irradiated fuel assemblies in the [secondary] containment or during OPDRVs, with two [control room AC] subsystems inoperable, 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, handling of [recently] irradiated fuel 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, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

SURVEILLANCE
REQUIREMENTS

SR 3.7.5.1

This SR verifies that the heat removal capability of the system is sufficient to remove the control room heat load assumed in the [safety analyses]. The SR consists of a combination of testing and calculation. The [18] month Frequency is appropriate since significant degradation of the [Control Room AC] System is not expected over this time period.

REFERENCES

1. FSAR, Section [6.4].

Insert 3

BWR/4 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.

3.7 PLANT SYSTEMS

3.7.6 Main Condenser Offgas

LCO 3.7.6 The gross gamma activity rate of the noble gases measured at [the main condenser evacuation system pretreatment monitor station] shall be \leq [240] mCi/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 mainsteam lines.	12 hours]
	<u>OR</u>	
	B.2 Isolate SJAE.	12 hours
	<u>OR</u>	
	B.3.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	B.3.2 Be in MODE 4.	36 hours

BASES

APPLICABILITY (continued)

SJAE in operation. In MODES 4 and 5, steam is not being exhausted to the main condenser and the requirements are not applicable.

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 the source of the 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.

overall plant risk is minimized

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.

Insert 1

SURVEILLANCE
REQUIREMENTS

SR 3.7.6.1

This SR, on a 31 day Frequency, requires an isotopic analysis of an offgas sample to ensure that the required limits are satisfied. The noble gases to be sampled are Xe-133, Xe-135, Xe-138, Kr-85, Kr-87, and Kr-88. If the measured rate of radioactivity increases significantly (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

BASES

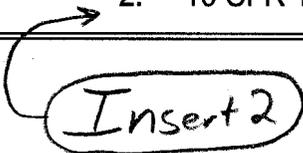
SURVEILLANCE REQUIREMENTS (continued)

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.

REFERENCES 1. FSAR, Section [15.1.35].

 2. 10 CFR 100.

Insert 2

BWR/4 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. 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 2

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>F. [One [required] [automatic load sequencer] inoperable.</p>	<p>----- - REVIEWER'S NOTE - This Condition may be deleted if the unit design is such that any sequencer failure mode will only affect the ability of the associated DG to power its respective safety loads following a loss of offsite power independent of, or coincident with, a Design Basis Event. -----</p> <p>F.1 Restore [required] [automatic load sequencer] to OPERABLE status.</p>	<p>[12] hours]</p>
<p>G. Required Action and Associated Completion Time of Condition A, B, C, D, E, or [F] not met.</p>	<p>G.1 Be in MODE 3. AND G.2 Be in MODE 4.</p>	<p>12 hours 36 hours</p>
<p>H. Three or more [required] AC sources inoperable [for reasons other than Condition E].</p>	<p>H.1 Enter LCO 3.0.3.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.1 Verify correct breaker alignment and indicated power availability for each [required] offsite circuit.</p>	<p>7 days</p>

BASES

ACTIONS (continued)

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. 6), with both DGs inoperable, operation may continue for a period that should not exceed 2 hours.

[F.1

The sequencer(s) is an essential support system to [both the offsite circuit and the DG associated with a given ESF bus.] [Furthermore, the sequencer(s) is on the primary success path for most major AC electrically powered safety systems powered from the associated ESF bus.] Therefore, loss of an [ESF bus's sequencer] affects every major ESF System in the [division]. The [12] hour Completion Time provides a period of time to correct the problem commensurate with the importance of maintaining sequencer OPERABILITY. This time period also ensures that the probability of an accident requiring sequencer OPERABILITY occurring during periods when the sequencer is inoperable is minimal.

This Condition is preceded by a Note that allows the Condition to be deleted if the unit design is such that any sequencer failure mode only affects the ability of the associated DG to power its respective safety loads under any conditions. Implicit in this Note is the concept that the Condition must be retained if any sequencer failure mode results in the inability to start all or part of the safety loads when required regardless of power availability, or results in overloading the offsite power circuit to a safety bus during an event thereby causing its failure. Also implicit in the Note is that the Condition is not applicable to any division that does not have a sequencer.]

G.1 and G.2

Overall plant risk is minimized

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 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 (15) 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

BASES

ACTIONS (continued)

H.1

Condition H 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.

SURVEILLANCE
REQUIREMENTS

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

Where the SRs discussed herein specify voltage and frequency tolerances, the following summary is applicable. The minimum steady state output voltage of [3740] V is 90% of the nominal 4160 V output voltage. This value, which is specified in ANSI C84.1 (Ref. 12), allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 90% of name plate rating. The specified maximum steady state output voltage of [4756] 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. 3).

SR 3.8.1.1

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution buses and loads are connected to their preferred power source and that appropriate

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 3.8.1.7

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 for SR 3.8.1.7) 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.

[In order to reduce stress and wear on diesel engines, some manufacturers recommend 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, which is only applicable when such modified start procedures are recommended by the manufacturer.]

SR 3.8.1.7 requires that, at a 184 day Frequency, the DG starts from standby conditions and achieves required voltage and frequency within 12 seconds. The 12 second start requirement supports the assumptions in the design basis LOCA analysis of FSAR, Section [6.3] (Ref. ~~12~~). The 12 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 12 second start requirement of SR 3.8.1.7 applies. 13

Since SR 3.8.1.7 does require a 12 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 to the SR requirements, the time for the DG to reach steady state operation, unless the modified DG start method is employed, is

BASES

SURVEILLANCE REQUIREMENTS (continued)

Note 4 stipulates a prerequisite requirement for performance of this SR. A successful DG start must precede this test to credit satisfactory performance.

SR 3.8.1.4

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

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

SR 3.8.1.5

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel oil day [and engine mounted] tanks once every [31] days 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. 10). 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. (11)

SR 3.8.1.6

This Surveillance demonstrates that each required fuel oil transfer pump operates and 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 the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact,

BASES

SURVEILLANCE REQUIREMENTS (continued)

the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE.

[The Frequency for this SR is variable, depending on individual system design, with up to a [92] day interval. The [92] day Frequency corresponds to the testing requirements for pumps as contained in the ASME Boiler and Pressure Vessel Code, Section XI (Ref. ~~13~~); however, ⁽¹⁴⁾ the design of fuel transfer systems is such that pumps operate automatically or must be started manually in order to maintain an adequate volume of fuel oil in the day [and engine mounted] tanks during or following DG testing. In such a case, a 31 day Frequency is appropriate. Since proper operation of fuel transfer systems is an inherent part of DG OPERABILITY, the Frequency of this SR should be modified to reflect individual designs.]

SR 3.8.1.7

See SR 3.8.1.2.

[SR 3.8.1.8

Transfer of each 4.16 kV ESF bus power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. The [18 month] Frequency of the Surveillance is based on engineering judgment taking into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed on the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.]

This SR is modified by a Note. The reason for the Note is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential

BASES

SURVEILLANCE REQUIREMENTS (continued)

outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

SR 3.8.1.9

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. The largest single load for each DG is a residual heat removal service water pump (1225 bhp). This Surveillance may be accomplished by either:

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

As required by IEEE-308 (Ref. ⁽¹⁵⁾14), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower. For DGs 2A, 2C, and 1B, this represents 65.5 Hz, equivalent to 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. 3) recommendations for response during load sequence intervals. The [6] seconds specified is equal to 60% of the 10 second load sequence interval associated with sequencing the residual heat removal (RHR) 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 3.8.1.9.a corresponds to the

BASES

SURVEILLANCE REQUIREMENTS (continued)

maximum frequency excursion, while SR 3.8.1.9.b and SR 3.8.1.9.c are steady state voltage and frequency values to which the system must recover following load rejection. The [18 month] Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. ①). ⑩

This SR is modified by two Notes. The reason for Note 1 is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. Note 2 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of $\leq [0.9]$. This power factor is representative of the actual inductive loading a DG would see under design basis accident conditions. Under certain conditions, however, Note 2 allows the surveillance to be conducted at a power factor other than $\leq [0.9]$. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to $\leq [0.9]$ results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to $[0.9]$ while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DC excitation levels needed to obtain a power factor of $[0.9]$ may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DC. In such cases, the power factor shall be maintained as close as practicable to $[0.9]$ without exceeding the DG excitation limits. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, Note 2 requires that, if

BASES

SURVEILLANCE REQUIREMENTS (continued)

synchronized to offsite power, testing must be performed using a power factor \leq [0.9]. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

- REVIEWER'S NOTE -

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

- a. Performance of the SR will not render any safety system or component inoperable,
 - b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and
 - c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.
-

SR 3.8.1.10

This Surveillance demonstrates the DG capability to reject a full load without overspeed tripping or exceeding the predetermined voltage limits. The DG full load rejection may occur because of a system fault or inadvertent breaker tripping. This Surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the DG experiences following a full load rejection and verifies that the DG does not trip upon loss of the load. These acceptance criteria provide 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.

The [18 month] Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. ⑩) and is intended to be consistent with expected fuel cycle lengths. ⑩

This SR is modified by two Notes. The reason for Note 1 is that during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that would challenge

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

SR 3.8.1.11

As required by Regulatory Guide 1.108 (Ref. ¹⁰), paragraph 2.a.(1), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG auto-start time of 12 seconds is derived from requirements of the accident analysis for responding to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved.

The requirement to verify the connection and power supply of permanent and auto-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, Emergency Core Cooling Systems (ECCS) injection valves are not desired to be stroked open, or systems are not capable of being operated at full flow, or RHR systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of 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 [18 months]¹⁰ is consistent with the recommendations of Regulatory Guide 1.108 (Ref. ¹⁰), paragraph 2.a.(1), takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

BASES

SURVEILLANCE REQUIREMENTS (continued)

in any of the restricted MODES can satisfy the following criteria, as applicable:

- a. Performance of the SR will not render any safety system or component inoperable,
 - b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment, and
 - c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.
-

SR 3.8.1.14

Regulatory Guide 1.108 (Ref. ⁽¹⁰⁾ 10), paragraph 2.a.(3), requires demonstration once per [18 months] 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 the continuous rating of the DG, and 2 hours of which is at a load equivalent to 110% of the continuous duty rating of the DG. Plant Hatch has taken an exception to this requirement and performs the 2 hour run at the 2000 hour rating (3100 kW). 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

A 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 [18 month] Frequency is ⁽¹⁰⁾ consistent with the recommendations of Regulatory Guide 1.108 (Ref. ⁽⁹⁾), paragraph 2.a.(3); takes into consideration plant conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.

This Surveillance has been modified by three Notes. Note 1 states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit do not invalidate the test. The reason for Note 2 is that during operation with the reactor critical, performance of this Surveillance could cause perturbations to the electrical distribution systems that would challenge continued steady state operation and, as a result, plant safety systems. Note 3 ensures that the DG is tested under load conditions that are as close to design basis conditions as possible. When synchronized with offsite power, testing should be performed at a power factor of $\leq [0.9]$. This power factor is representative of the actual inductive loading a DG would see under design basis accident conditions. Under certain conditions, however, Note 3 allows the surveillance to be conducted at a power factor other than $\leq [0.9]$. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to $\leq [0.9]$ results in voltages on the emergency busses that are too high. Under these conditions, the power factor should be maintained as close as practicable to $[0.9]$ while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain a power factor of $[0.9]$ may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close as practicable to $[0.9]$ without exceeding the DG excitation limits. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system

BASES

SURVEILLANCE REQUIREMENTS (continued)

when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

SR 3.8.1.15

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within [12] seconds. The [12] second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA. The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. ②), paragraph 2.a.(5).

This SR is modified by two 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 full load conditions prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. The load band is provided to avoid routine overloading of the DG. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.

SR 3.8.1.16

As required by Regulatory Guide 1.108 (Ref. ②), paragraph 2.a.(6), this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and 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 load sequence timers are reset.

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(6), and takes into consideration plant conditions required to perform the Surveillance.

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

SR 3.8.1.17

Demonstration of the test mode override ensures that the DG availability under accident conditions is not compromised as the result of testing. Interlocks to the LOCA sensing circuits cause the DG to automatically reset to ready-to-load operation if an ECCS initiation signal is received during operation in the test mode. Ready-to-load operation is defined as the DG running at rated speed and voltage with the DG output breaker open. These provisions for automatic switchover are required by IEEE-308 (Ref. 14), paragraph 6.2.6(2).

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. ⑩), paragraph 2.a.(8); 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 that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

SR 3.8.1.18

Under accident conditions [and loss of offsite power] loads are sequentially connected to the bus by the automatic load sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading of the DGs due to high motor starting currents. The [10]% load sequence time interval tolerance ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. Reference 2 provides a summary of the automatic loading of ESF buses.

The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. ⑩), paragraph 2.a.(2); takes into

BASES

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 speed within the specified time when the DGs are started simultaneously.

The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. ⑩).

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

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. FSAR, Section [8.2].
3. Regulatory Guide 1.9.
4. FSAR, Chapter [6].
5. FSAR, Chapter [15].
6. Regulatory Guide 1.93.
7. Generic Letter 84-15.
- 9 ⑩. 10 CFR 50, Appendix A, GDC 18.
- 10 ⑩. Regulatory Guide 1.108.
- 11 ⑩. Regulatory Guide 1.137.
- 12 ⑩. ANSI C84.1, 1982.
- 13 ⑩. FSAR, Section [6.3].
- 14 ⑩. ASME Boiler and Pressure Vessel Code, Section XI.

Insert 2 →

BASES

REFERENCES (continued)

15 ~~14~~. IEEE Standard 308.

BWR/4 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. 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 2

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

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

LCO 3.8.4 The [Division 1 and Division 2 station service, and DG 1B, 2A, and 2C] DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One [or two] battery charger[s] on one division] inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage.	2 hours
	<u>AND</u>	
	A.2 Verify battery float current \leq [2] amps.	Once per [12] hours
	<u>AND</u>	
	A.3 Restore battery charger[s] to OPERABLE status.	7 days
[B. One [or two] batter[y][ies] on one division] inoperable.	B.1 Restore batter[y][ies] to OPERABLE status.	[2] hours]
C. One DC electrical power subsystem inoperable for reasons other than Condition A [or B].	C.1 Restore DC electrical power subsystem to OPERABLE status.	[2] hours
D. Required Action and Associated Completion Time of Condition A[, B, or C] not met for station service DC subsystem.	D.1 Be in MODE 3.	12 hours
	<u>AND</u> D.2 Be in MODE 4.	36 hours

BASES

ACTIONS (continued)

complete loss of DC power to the affected division. The 2 hour limit is consistent with the allowed time for an inoperable DC Distribution System division.

If one of the required DC electrical power subsystems is inoperable for reasons other than Condition A or B (e.g., inoperable battery charger and associated inoperable battery), the remaining DC electrical power subsystems have the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst case single failure could, however, result in the loss of minimum necessary DC electrical subsystems to mitigate a worst case accident, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 7) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and, if the DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown.

D.1 and D.2

Overall plant risk is minimized

If the inoperable station service 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. 7).~~

Insert 1

IS

E.1

If the DG DC electrical power subsystem cannot be restored to OPERABLE status in the associated Completion Time, the associated DG may be incapable of performing its intended function and must be immediately declared inoperable. This declaration also requires entry into applicable Conditions and Required Actions for an inoperable DG, LCO 3.8.1, "AC Sources - Operating."

BASES

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 battery chargers, which support 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 while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer ([2.20] Vpc or [127.6] V at the battery terminals). This voltage maintains the battery plates in a condition that supports maintaining the grid life (expected to be approximately 20 years). The 7 day Frequency is consistent with manufacturer recommendations and IEEE-450 (Ref. ⑧).

SR 3.8.4.2

This SR verifies the design capacity of the battery chargers. According to Regulatory Guide 1.32 (Ref. ⑩), the battery charger supply is recommended 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.

This SR provides two options. One option requires that each battery charger be capable of supplying [400] amps at the minimum established float voltage for [8] hours. The ampere requirements are based on the output rating of the chargers. The voltage requirements are based on the charger voltage level after a response to a loss of AC power. The time period is sufficient for the charger temperature to have stabilized and to have been maintained for at least [2] hours.

The other option requires that each battery charger be capable of recharging the battery after a service test coincident with supplying the largest coincident demands of the various continuous steady state loads (irrespective of the status of the plant during which these demands occur). This level of loading may not normally be available following the battery service test and will need to be supplemented with additional loads. The duration for this test may be longer than the charger sizing criteria since the battery recharge is affected by float voltage,

BASES

SURVEILLANCE REQUIREMENTS (continued)

temperature, and the exponential decay in charging current. The battery is recharged when the measured charging current is \leq [2] amps.

The Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these [18 month] intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

SR 3.8.4.3

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 discharge rate and test length corresponds to the design duty cycle requirements as specified in Reference 4.

The Frequency of [18 months]⁽¹⁰⁾ is consistent with the recommendations of Regulatory Guide 1.32 (Ref. ⁽⁹⁾) and Regulatory Guide 1.129 (Ref. ⁽¹¹⁾), which state that the battery service test should be performed during refueling operations or at some other outage, with intervals between tests not to exceed [18 months].

This SR is modified by two Notes. Note 1 allows the performance of a modified performance discharge test in lieu of a service test.

The reason for Note 2 is that performing the Surveillance would remove a required DC electrical power subsystem from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of

BASES

SURVEILLANCE REQUIREMENTS (continued)

the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
 2. Regulatory Guide 1.6.
 3. IEEE Standard 308, 1978.
 4. FSAR, Chapter [8].
 5. FSAR, Chapter [6].
 6. FSAR, Chapter [15].
 7. Regulatory Guide 1.93.
 - 9 ~~8~~ IEEE Standard 450, 1995.
 - 10 ~~9~~ Regulatory Guide 1.32, February 1977.
 - 11 ~~10~~ Regulatory Guide 1.129, December 1974.
-
-

Insert 2 →

BWR/4 LCO 3.8.7 Inverters - 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.

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters - Operating

LCO 3.8.7 The [Division 1] and [Division 2] inverters shall be OPERABLE.

- NOTE -

[One/two] inverter[s] may be disconnected from [its/their] associated DC bus for ≤ [24] hours to perform an equalizing charge on [its/their] associated [common] battery, provided:

- a. The associated AC vital bus[es] [is/are] energized from [its/their] [Class 1E constant voltage transformers] [inverter using internal AC source] and
- b. All other AC vital buses are energized from their associated OPERABLE inverters.]

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One [required] inverter inoperable.	<p>A.1</p> <p style="text-align: center;">----- - NOTE - -----</p> <p>Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating" with any AC vital bus de-energized.</p> <p style="text-align: center;">-----</p> <p>Restore inverter to OPERABLE status.</p>	24 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours
	<p>AND</p> <p>B.2 Be in MODE 4.</p>	36 hours

BASES

APPLICABILITY (continued)

- a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients and
- b. Adequate core cooling is provided, and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

Inverter requirement for MODES 4 and 5 are covered in the Bases for LCO 3.8.8, "Inverters - Shutdown."

ACTIONS

A.1

With a required inverter inoperable, its associated AC vital bus becomes inoperable until it is manually re-energized from its [Class 1E constant voltage source transformer or inverter using an internal AC source]. LCO 3.8.9 addresses this action; however, pursuant to LCO 3.0.6, these actions would not be entered even if the AC vital bus were de-energized. Therefore, the ACTIONS are modified by a Note to require the ACTIONS for LCO 3.8.9 be entered immediately. This ensures the vital bus is re-energized within 2 hours.

Required Action A.1 allows 24 hours to fix the inoperable inverter and return it to service. The 24 hour limit is based upon engineering judgment and takes into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This risk has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems that such a shutdown might entail. When the AC vital bus is powered from its constant voltage source, it is relying upon interruptible AC electrical power sources (offsite and onsite). Similarly, the uninterruptible inverter source to the AC vital buses is the preferred source for powering instrumentation trip setpoint devices.

B.1 and B.2

Overall plant risk is minimized

If the inoperable devices or components 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 15 reasonable, based on operating experience, to reach the required plant

Insert 1

BASES

ACTIONS (continued)

conditions from full power conditions in an orderly manner and without challenging unit systems.

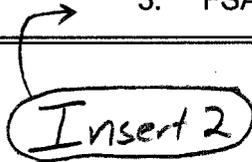
SURVEILLANCE
REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and AC vital buses energized from the inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for instrumentation connected to the AC vital buses. The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.

REFERENCES

1. FSAR, Chapter [8].
 2. FSAR, Chapter [6].
 3. FSAR, Chapter [15].
-

Insert 2

BWR/4 LCO 3.8.9 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.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more [station service] DC electrical power distribution subsystems inoperable.	C.1 Restore DC electrical power distribution subsystem(s) to OPERABLE status.	2 hours <u>AND</u> 16 hours from discovery of failure to meet LCO
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Be in MODE 3. <u>AND</u> D.2 Be in MODE 4.	12 hours 36 hours
E. [One or more DG DC electrical power distribution subsystems inoperable.	E.1 Declare associated DG(s) inoperable.	Immediately]
F. Two or more electrical power distribution subsystems inoperable that result in a loss of function.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.9.1 Verify correct breaker alignments and voltage to [required] AC, DC, [and AC vital bus] electrical power distribution subsystems.	7 days

BASES

ACTIONS (continued)

establishing the "time zero" at the time the LCO was initially not met, instead of at the time Condition C was entered. The 16 hour Completion Time is an acceptable limitation on this potential of failing to meet the LCO indefinitely.

D.1 ~~and D.2~~

Overall plant risk is minimized

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 13 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

E.1

With one or more DG DC buses inoperable, the associated DG(s) may be incapable of performing their intended functions. In this situation the DG(s) must be immediately declared inoperable. This action also requires entry into applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating."

F.1

Condition F corresponds to a level of degradation in the electrical distribution system that causes a required safety function to be lost. When more than one AC or DC electrical power distribution subsystem is lost, and this 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.

SURVEILLANCE
REQUIREMENTS

SR 3.8.9.1

This Surveillance verifies that the AC and DC, electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical buses 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

BASES

SURVEILLANCE REQUIREMENTS (continued)

critical system loads connected to these buses. The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC vital bus electrical power distribution subsystems, and other indications available in the control room that alert the operator to subsystem malfunctions.

REFERENCES

1. FSAR, Chapter [6].
 2. FSAR, Chapter [15].
 3. Regulatory Guide 1.93, December 1974.
-
-

→
Insert 2

BWR/6 LCO 3.3.8.2 RPS Electric Power Monitoring

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.

3.3 INSTRUMENTATION

3.3.8.2 Reactor Protection System (RPS) Electric Power Monitoring

LCO 3.3.8.2 Two RPS electric power monitoring assemblies shall be OPERABLE for each inservice RPS motor generator set or alternate power supply.

APPLICABILITY: MODES 1, 2, and 3,
MODES 4 and 5 [with any control rod withdrawn from a core cell containing one or more fuel assemblies].

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or both inservice power supplies with one electric power monitoring assembly inoperable.	A.1 Remove associated inservice power supply(s) from service.	72 hours
B. One or both inservice power supplies with both electric power monitoring assemblies inoperable.	B.1 Remove associated inservice power supply(s) from service.	1 hour
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 Be in MODE 3.	12 hours
	<u>AND</u> C.2 Be in MODE 4.	36 hours
D. Required Action and associated Completion Time of Condition A or B not met in MODE 4 or 5 [with any control rod withdrawn from a core cell containing one or more fuel assemblies].	D.1 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. <u>AND</u>	Immediately

BASES

ACTIONS (continued)

power supply with OPERABLE power monitoring assemblies may then be used to power the RPS bus.

The 72 hour Completion Time takes into account the remaining OPERABLE electric power monitoring assembly and the low probability of an event requiring RPS Electric Power Monitoring protection occurring during this period. It allows time for plant operations personnel to take corrective actions or to place the plant in the required condition in an orderly manner and without challenging plant systems.

Alternatively, if it is not desired to remove the power supply(s) from service (e.g., as in the case where removing the power supply(s) from service would result in a scram or isolation), Condition C or D, as applicable, must be entered and its Required Actions taken.

B.1

If both power monitoring assemblies for an inservice power supply (MG set or alternate) are inoperable, or both power monitoring assemblies in each inservice power supply are inoperable, the system protective function is lost. In this condition, 1 hour is allowed to restore one assembly to OPERABLE status for each inservice power supply. If one inoperable assembly for each inservice power supply cannot be restored to OPERABLE status, the associated power supplies must be removed from service within 1 hour (Required Action B.1). An alternate power supply with OPERABLE assemblies may then be used to power one RPS bus. The 1 hour Completion Time is sufficient for the plant operations personnel to take corrective actions and is acceptable because it minimizes risk while allowing time for restoration or removal from service of the electric power monitoring assemblies.

Alternately, if it is not desired to remove the power supply(s) from service (e.g., as in the case where removing the power supply(s) from service would result in a scram or isolation), Condition C or D, as applicable, must be entered and its Required Actions taken.

C.1 (and C.2)

If any Required Action and associated Completion Time of Condition A or B are not met in MODE 1, 2, or 3, a plant shutdown must be performed. This places the plant in a condition where minimal equipment, powered through the inoperable RPS electric power monitoring assembly(s), is required and ensures that the safety function

the plant must be brought to a MODE in which overall plant risk is minimized

BASES

ACTIONS (continued)

~~of the RPS (e.g., scram of control rods) is not required.~~ The plant shutdown is accomplished by placing the plant in MODE 3 within 12 hours ~~and in MODE 4 within 36 hours.~~ The allowed Completion Times ^{is} ~~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*

D.1, D.2.1, and D.2.2

If any Required Action and associated Completion Time of Condition A or B are not met in MODE 4 or 5, with any control rod withdrawn from a core cell containing one or more fuel assemblies or with both RHR shutdown cooling valves open, the operator must immediately initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies (Required Action D.1). This Required Action results in the least reactive condition for the reactor core and ensures that the safety function of the RPS (e.g., scram of control rods) is not required.

In addition, action must be immediately initiated to either restore one electric power monitoring assembly to OPERABLE status for the inservice power source supplying the required instrumentation powered from the RPS bus (Required Action D.2.1) or to isolate the RHR Shutdown Cooling System (Required Action D.2.2). Required Action D.2.1 is provided because the RHR Shutdown Cooling System may be needed to provide core cooling. All actions must continue until the applicable Required Actions are completed.

SURVEILLANCE
REQUIREMENTS

SR 3.3.8.2.1

A CHANNEL FUNCTIONAL TEST is performed on each overvoltage, undervoltage, and underfrequency channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology.

As noted in the Surveillance, the CHANNEL FUNCTIONAL TEST is only required to be performed while the plant is in a condition in which the loss

BASES

SURVEILLANCE REQUIREMENTS (continued)

of the RPS bus will not jeopardize steady state power operation (the design of the system is such that the power source must be removed from service to conduct the Surveillance). The 24 hours is intended to indicate an outage of sufficient duration to allow for scheduling and proper performance of the Surveillance. The 184 day Frequency and the Note in the Surveillance are based on guidance provided in Generic Letter 91-09 (Ref. ②).

③
SR 3.3.8.2.2

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.8.2.3

Performance of a system functional test demonstrates a required system actuation (simulated or actual) signal. The logic of the system will automatically trip open the associated power monitoring assembly circuit breaker. Only one signal per power monitoring assembly is required to be tested. This Surveillance overlaps with the CHANNEL CALIBRATION to provide complete testing of the safety function. The system functional test of the Class 1E circuit breakers is included as part of this test to provide complete testing of the safety function. If the breakers are incapable of operating, the associated electric power monitoring assembly would be inoperable.

The 18 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 that these components usually pass the Surveillance when performed at the 18 month Frequency.

BASES

REFERENCES

1. FSAR, Section [8.3.1.1.5].

Insert 2



2. NRC Generic Letter 91-09, "Modification of Surveillance Interval for the Electric Protective Assemblies in Power Supplies for the Reactor Protection System."

BWR/6 LCO 3.4.4 Safety / 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. 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

C.1 and C.2

If [two] or more [required] S/RVs are inoperable, a transient may result in the violation of the ASME Code limit on reactor pressure. 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.

INSERT 3

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

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 Safety/Relief Valves (S/RVs)

LCO 3.4.4 The safety function of [seven] S/RVs shall be OPERABLE,

AND

The relief function of [seven] additional S/RVs shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. [One [required] S/RV inoperable.	A.1 Restore [required] S/RV to OPERABLE status.	14 days]
B. [Required Action and associated Completion Time of Condition Anot met.]	B.1 Be in MODE 3.	12 hours
	B.2 Be in MODE 4.	36 hours
<u>OR</u>		
C. [Two] or more [required] S/RVs inoperable.	C.1 Be in MODE 3.	12 hours
	<u>AND</u> C.2 Be in MODE 4.	36 hours

BASES

APPLICABILITY (continued)

S/RVs 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 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 limit is 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 S/RV function is not needed during these conditions.

ACTIONS

A.1

With the safety function of one [required] S/RV inoperable, the remaining OPERABLE S/RVs are capable of providing the necessary overpressure protection. Because of additional design margin, the ASME Code limits for the RCPB can also be satisfied with two S/RVs inoperable. However, the overall reliability of the pressure relief system is reduced because additional failures in the remaining OPERABLE S/RVs 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 S/RVs to OPERABLE status is based on the relief capability of the remaining S/RVs, the low probability of an event requiring S/RV actuation, and a reasonable time to complete the Required Action.

B.1 and B.2

Overall plant risk is minimized

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

is →

Insert 1

← Insert 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

steam flow, or any other method suitable to verify steam flow. Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve. Also, adequate steam flow must be passing through the main turbine or turbine bypass valves to continue to control reactor pressure when the S/RVs divert steam flow upon opening. Sufficient time is therefore allowed after the required pressure and flow are achieved to perform this test. Adequate pressure at which this test is to be performed is 950 psig (the pressure recommended by the valve manufacturer). Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow $\geq 10^6$ lb/hr]. Plant startup is allowed prior to performing this test because valve OPERABILITY and the setpoints for overpressure protection are verified, per ASME requirements, prior to valve installation. Therefore, this SR is modified by a Note that states the Surveillance is not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. The 12 hours allowed for manual actuation after the required pressure is reached is sufficient to achieve stable conditions for testing and provides a reasonable time to complete the SR. If the valve fails to actuate due only to the failure of the solenoid but is capable of opening on overpressure, the safety function of the S/RV is considered OPERABLE.

The [18] month on a STAGGERED TEST BASIS Frequency ensures that each solenoid for each S/RV is alternately tested. The 18 month Frequency was developed based on the S/RV tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 1). Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. ASME, Boiler and Pressure Vessel Code, Section III.
2. FSAR, Section [5.2.5.5.3].
3. FSAR, Section [15].

Insert 3

BWR/6 LCO 3.5.1 ECCS - 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. 13) 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

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>D. Required Action and associated Completion Time of Condition A, B, or C not met.</p>	<p>D.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>D.2 Be in MODE 4.</p>	<p>12 hours</p> <p>36 hours</p>
<p>E. One ADS valve inoperable.</p>	<p>E.1 Restore ADS valve to OPERABLE status.</p>	<p>14 days</p>
<p>F. One ADS valve inoperable.</p> <p><u>AND</u></p> <p>One low pressure ECCS injection/spray subsystem inoperable.</p>	<p>F.1 Restore ADS valve to OPERABLE status.</p> <p><u>OR</u></p> <p>F.2 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.</p>	<p>72 hours</p> <p>72 hours</p>
<p>G. Two or more ADS valves inoperable.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition E or F not met.</p>	<p>G.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>G.2 Reduce reactor steam dome pressure to ≤ [150] psig.</p>	<p>12 hours</p> <p>36 hours</p>

BASES

ACTIONS (continued)

14 day Completion Time is based on the results of a reliability study (Ref. 12) and has been found to be acceptable through operating experience.

C.1

With two ECCS injection subsystems inoperable or one ECCS injection and one ECCS spray subsystem inoperable, at least one ECCS injection/spray subsystem must be restored to OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE subsystems provide adequate core cooling during a LOCA. However, overall ECCS reliability is reduced in this Condition because a single failure in one of the remaining OPERABLE subsystems concurrent with a design basis LOCA may result in the ECCS not being able to perform its intended safety function. Since the ECCS availability is reduced relative to Condition A, a more restrictive Completion Time is imposed. The 72 hour Completion Time is based on a reliability study, as provided in Reference 12.

D.1 and D.2

Insert 1

Overall plant risk is minimized

If any Required Action and associated Completion Time of Condition A, B, or C are 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.

E.1

(H)

The LCO requires eight ADS valves to be OPERABLE to provide the ADS function. Reference (13) contains the results of an analysis that evaluated the effect of one ADS valve being out of service. Per this analysis, operation of only seven ADS valves will provide the required depressurization. However, 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 (Ref. 12) and has been found to be acceptable through operating experience.

BASES

ACTIONS (continued)

F.1 and F.2

If any one low pressure ECCS injection/spray subsystem is inoperable in addition to one inoperable ADS valve, adequate core cooling is ensured by the OPERABILITY of HPCS and the remaining low pressure ECCS injection/spray subsystems. However, the overall ECCS reliability is reduced because a single active component failure concurrent with a design basis LOCA could result in the minimum required ECCS equipment not being available. Since both a high pressure (ADS) and low pressure subsystem are inoperable, a more restrictive Completion Time of 72 hours is required to restore either the low pressure ECCS injection/spray subsystem or the ADS valve to OPERABLE status. This Completion Time is based on a reliability study (Ref. 12) and has been found to be acceptable through operating experience.

G.1 and G.2

Overall plant risk is minimized

MODE

If any Required Action and associated Completion Time of Condition E or F are not met or if two or more 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 < 150 psig within 36 hours. The allowed Completion Times are reasonable, based on 15 operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

Insert 1

H.1

When multiple ECCS subsystems are inoperable, as stated in Condition H, 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 HPCS System, LPCS System, and LPCI subsystems full of water ensures that the systems will perform properly, injecting their full capacity into the RCS upon demand. This will also prevent a water hammer following an ECCS initiation signal. One acceptable method of ensuring the lines are full is to vent at the high points. The 31 day Frequency is based on operating

BASES

SURVEILLANCE REQUIREMENTS (continued)

experience, on the procedural controls governing system operation, and on the gradual nature of void buildup in the ECCS piping.

SR 3.5.1.2

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS 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 potentially 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 of this SR was derived from the Inservice Testing Program requirements for performing valve testing at least once every 92 days. The Frequency of 31 days is further justified because the valves are operated under procedural control and because improper valve alignment would only affect a single subsystem. This Frequency has been shown to be acceptable through operating experience.

This SR is modified by a Note that allows LPCI subsystems to be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the RHR cut in permissive pressure in MODE 3, if capable of being manually realigned (remote or local) to the LPCI mode and not otherwise inoperable. This allows operation in the RHR shutdown cooling mode during MODE 3 if necessary.

SR 3.5.1.3

Verification every 31 days that ADS air receiver pressure is \geq [150] psig assures adequate air pressure for reliable ADS operation. The accumulator on each ADS valve provides pneumatic pressure for valve actuation. The designed pneumatic supply pressure requirements for the accumulator are such that, following a failure of the pneumatic supply to the accumulator, at least two valve actuations can occur with the drywell at 70% of design pressure (Ref. (14)). The ECCS safety analysis assumes only one actuation to achieve the depressurization required for operation

(15)

BASES

REFERENCES (continued)

10. 10 CFR 50.46.
11. FSAR, Section [6.3.3.3].
12. Memorandum from R.L. Baer (NRC) to V. Stello, Jr. (NRC),
"Recommended Interim Revisions to LCO's for ECCS Components,"
December 1, 1975.

Insert 2

14 ~~13~~. FSAR, Section [6.3.3.7.8].

15 ~~14~~. FSAR, Section [7.3.1.1.1.4.2].

BWR/6 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. 5), 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

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

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
	B.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.1.1 Perform required visual examinations and leakage rate testing except for primary containment air lock testing, in accordance with the Primary Containment Leakage Rate Testing Program.	In accordance with the Primary Containment Leakage Rate Testing Program
SR 3.6.1.1.2 [Verify primary containment structural integrity in accordance with the Primary Containment Tendon Surveillance Program.	In accordance with the Primary Containment Tendon Surveillance Program]

BASES

ACTIONS

A.1

In the event that 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 that is 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

If primary containment cannot be restored to OPERABLE status within the associated 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 ~~is~~ operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

Insert 1

SURVEILLANCE
REQUIREMENTS

SR 3.6.1.1.1

Maintaining the primary containment OPERABLE requires compliance with the visual examinations and leakage rate test requirements of the Primary Containment Leakage Rate Testing Program. Failure to meet air lock leakage testing (SR 3.6.1.2.1 and SR 3.6.1.2.4), [secondary containment bypass leakage (SR 3.6.1.3.9),] resilient seal primary containment purge valve leakage testing (SR 3.6.1.3.6), or main steam isolation valve leakage (SR 3.6.1.3.10) does not necessarily result in a failure of this SR. The impact of the failure to meet these SRs must be evaluated against the Type A, B, and C acceptance criteria of the Primary Containment Leakage Rate Testing Program. As left leakage prior to the first startup after performing a required Primary Containment Leakage Rate Testing Program leakage test is required to be $< 0.6 L_a$ for combined Type B and C leakage, and [$< 0.75 L_a$ for Option A] [$\leq 0.75 L_a$ for Option B] for overall Type A leakage. At all other times between required leakage rate tests, the acceptance criteria is based on an overall Type A leakage limit of $\leq 1.0 L_a$. At $\leq 1.0 L_a$ the offsite dose consequences are bounded by the assumptions of the safety analysis. The Frequency is required by the Primary Containment Leakage Rate Testing Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

- REVIEWER'S NOTE -

Regulatory Guide 1.163 and NEI 94-01 include acceptance criteria for as-left and as-found type A leakage rates and combined Type B and C leakage rates, which may be reflected in the Bases.

[SR 3.6.1.1.2

The structural integrity of the primary containment is ensured by the successful completion of the Primary Containment Tendon Surveillance Program and by associated visual inspections of the steel liner and penetrations for evidence of deterioration or breach of integrity. This ensures that the structural integrity of the primary containment will be maintained in accordance with the provisions of the Primary Containment Tendon Surveillance Program. Testing and Frequency are consistent with the recommendations of Regulatory Guide 1.35 (Ref. ~~6~~ ⁶).]

REFERENCES

1. FSAR, Section [6.2].
2. FSAR, Section [15.6.5].
3. 10 CFR 50, Appendix J, Option [A][B].
4. FSAR, Section [].
- ~~6~~ ⁶ Regulatory Guide 1.35, Revision [1].

Insert 2 →

BWR/6 LCO 3.6.1.6 Low-Low Set 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. 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

C.1 and C.2

If two or more LLS valves are inoperable, there could be excessive short duration S/RV cycling during an overpressure event. 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 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

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

3.6 CONTAINMENT SYSTEMS

3.6.1.6 Low-Low Set (LLS) Valves

LCO 3.6.1.6 The LLS function of [six] safety/relief valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One LLS valve inoperable.	A.1 Restore LLS valve to OPERABLE status.	14 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	12 hours 36 hours
OR C. Two or more LLS valves inoperable.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.6.1 ----- <p style="text-align: center;">- NOTE -</p> Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ----- Verify each LLS valve opens when manually actuated.	[18] months [on a STAGGERED TEST BASIS for each valve solenoid]

BASES

LCO [Six] LLS valves are required to be OPERABLE to satisfy the assumptions of the safety analysis (Ref. 2). The requirements of this LCO are applicable to the mechanical and electrical/pneumatic capability of the LLS valves to function for controlling the opening and closing of the S/RVs.

APPLICABILITY In MODES 1, 2, and 3, an event could cause pressurization of the reactor and opening of S/RVs. 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 LLS valves OPERABLE is not required in MODE 4 or 5.

ACTIONS

A.1

With one LLS valve inoperable, the remaining OPERABLE LLS valves are adequate to perform the designed function. However, the overall reliability is reduced. The 14 day Completion Time takes into account the redundant capability afforded by the remaining LLS S/RVs and the low probability of an event in which the remaining LLS S/RV capability would be inadequate.

B.1 ~~and B.2~~

Overall plant risk is minimized

If ~~two or more~~ LLS valves are inoperable or if the inoperable LLS 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~~ 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 is

Insert 1

SURVEILLANCE REQUIREMENTS

SR 3.6.1.6.1

A manual actuation of each LLS valve is performed to verify that the valve and solenoids are functioning properly and that no blockage exists in the valve discharge line. This can be demonstrated by the response of the turbine control or bypass valve, by a change in the measured steam flow, or by any other method that is suitable to verify steam flow. Adequate reactor steam dome pressure must be available to perform this test to avoid damaging the valve. Adequate pressure at which this test is to be performed is \geq [950] psig (the pressure recommended by the valve manufacturer). Also, adequate steam flow must be passing through the

BASES

SURVEILLANCE REQUIREMENTS (continued)

main turbine or turbine bypass valves to continue to control reactor pressure when the ADS valves divert steam flow upon opening. Adequate steam flow is represented by [at least 1.25 turbine bypass valves open, or total steam flow $\geq 10^6$ lb/hr]. The [18] month Frequency was developed based on the S/RV tests required by the ASME Boiler and Pressure Vessel Code, Section XI (Ref. ②). The Frequency of [18] months on a STAGGERED TEST BASIS ensures that each solenoid for each S/RV is alternately tested. Operating experience has shown these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint. ④

Since steam pressure is required in order to perform the Surveillance, however, and steam may not be available during a unit outage, the Surveillance may be performed during the shutdown prior to or the startup following a unit outage. Unit startup is allowed prior to performing this test because valve OPERABILITY and the setpoints for overpressure protection are verified by Reference ③ prior to valve installation. After adequate reactor steam dome pressure and flow are reached, 12 hours are allowed to prepare for and perform the test. ④

SR 3.6.1.6.2

The LLS designed S/RVs 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 automatic LLS function operate as designed when initiated either by an actual or simulated automatic initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.5.4 overlaps this SR to provide complete testing of the safety function.

The 18 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 18 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.

BASES

REFERENCES [1. GESSAR-II, Appendix 3BA.8.]

Insert 3 → 2. FSAR, Section [5.5.17].

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

BWR/6 LCO 3.6.1.7 RHR Containment Spray 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. 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.

3.6 CONTAINMENT SYSTEMS

3.6.1.7 Residual Heat Removal (RHR) Containment Spray System

LCO 3.6.1.7 Two RHR containment spray subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

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

BASES

LCO In the event of a Design Basis Accident (DBA), a minimum of one RHR containment spray subsystem is required to mitigate potential bypass leakage paths and maintain the primary containment peak pressure below design limits. To ensure that these requirements are met, two RHR containment spray subsystems must be OPERABLE. Therefore, in the event of an accident, at least one subsystem is OPERABLE assuming the worst case single active failure. An RHR containment spray subsystem is OPERABLE when the pump, the heat exchanger, and associated piping, valves, instrumentation, and controls are OPERABLE.

APPLICABILITY In MODES 1, 2, and 3, a DBA could cause 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, maintaining RHR containment spray subsystems OPERABLE is not required in MODE 4 or 5.

ACTIONS

A.1

With one RHR containment spray subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status within 7 days. In this Condition, the remaining OPERABLE RHR containment spray 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 was chosen in light of the redundant RHR containment capabilities afforded by the OPERABLE subsystem and the low probability of a DBA occurring during this period.

B.1

With two RHR containment spray 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 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 remove heat from primary containment are available.

C.1 and C.2

Overall plant risk is minimized

If the inoperable RHR containment spray subsystem 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

BASES

ACTIONS (continued)

Insert 1

to MODE 4 within ~~36~~ hours. The allowed Completion Times ~~are~~ 15 reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE
REQUIREMENTS

SR 3.6.1.7.1

Verifying the correct alignment for manual, power operated, and automatic valves in the RHR containment spray mode flow path provides assurance that the proper flow paths will exist for system operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. 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 of this SR is justified because the valves are operated under procedural control and because improper valve position would affect only a single subsystem. This Frequency has been shown to be acceptable based on operating experience.

A Note has been added to this SR that allows RHR containment spray subsystems to be considered OPERABLE during alignment to and operation in the RHR shutdown cooling mode when below [the RHR cut in permissive pressure in MODE 3], if capable of being manually realigned and not otherwise inoperable. At these low pressures and decay heat levels (the reactor is shut down in MODE 3), a reduced complement of subsystems can provide the required containment pressure mitigation function thereby allowing operation of an RHR shutdown cooling loop when necessary.

SR 3.6.1.7.2

Verifying each RHR pump develops a flow rate \geq [5650] gpm while operating in the suppression pool cooling mode with flow through the associated heat exchanger ensures that pump performance has not degraded during the cycle. It is tested in the pool cooling mode to demonstrate pump OPERABILITY without spraying down equipment in primary containment. Flow is a normal test of centrifugal pump performance required by the ASME Code, Section XI (Ref. 2). This test confirms one point on the pump design curve and is indicative of overall 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. [The Frequency of this SR is in accordance with the Inservice Testing Program or 92 days.]

SR 3.6.1.7.3

This SR verifies that each RHR containment spray subsystem automatic valve actuates to its correct position upon receipt of an actual or simulated automatic actuation signal. Actual spray initiation is not required to meet this SR. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.3.6 overlaps this SR to provide complete testing of the safety function. The [18] 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 that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.6.1.7.4

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

REFERENCES

Insert 2

③②

1. FSAR, Section [6.2.1.1.5].
- ② ASME, Boiler and Pressure Vessel Code, Section XI.

BWR/6 LCO 3.6.1.8 PVLCS

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.

3.6 CONTAINMENT SYSTEMS

3.6.1.8 Penetration Valve Leakage Control System (PVLCS)

LCO 3.6.1.8 [Two] PVLCS subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One PVLCS subsystem inoperable.	A.1 Restore PVLCS subsystems to OPERABLE status.	30 days
B. [Two] PVLCS subsystems inoperable.	B.1 Restore one PVLCS subsystem to OPERABLE status.	7 days
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	12 hours
	AND C.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.8.1 Verify air pressure in each subsystem is \geq [101] psig.	24 hours
SR 3.6.1.8.2 Perform a system functional test of each PVLCS subsystem.	[18] months

BASES

LCO (continued)

leakage when the containment atmosphere is at the maximum peak containment pressure, P_a .

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, the PVLCS is not required to be OPERABLE in MODES 4 and 5 to prevent leakage of radioactive material from primary containment.

ACTIONS

A.1

With one PVLCS subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status within 30 days. In this Condition, the remaining OPERABLE PVLCS subsystem is adequate to perform the leakage control function. The 30 day Completion Time is based on the low probability of the occurrence of a LOCA, the amount of time available after the event for operator action to prevent exceeding this limit, the low probability of failure of the OPERABLE PVLCS subsystem, and the availability of the PCIVs.

B.1

With [two] PVLCS subsystems inoperable, at least one subsystem must be restored to OPERABLE status within 7 days. The 7 day Completion Time is based on the low probability of the occurrence of a DBA LOCA, the availability of 25 minutes for operator action, and the availability of the PCIVs.

C.1 (and C.2)

overall plant risk is minimized

If the inoperable PVLCS subsystem 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 ^{is} on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

Insert 1

BASES

SURVEILLANCE
REQUIREMENTS

SR 3.6.1.8.1

The minimum air supply necessary for PV LCS OPERABILITY varies with the system being supplied with compressed air from the PV LCS accumulators. Due to the support system function of PV LCS for S/RV actuator air, however, the specified minimum pressure of [101] psig is required, which provides sufficient air for [] S/RV actuations with the drywell pressure at 30 psig. This minimum air pressure alone is sufficient for PV LCS to support the OPERABILITY of these S/RV systems and is verified every 24 hours. The 24 hour Frequency is considered adequate in view of other indications available in the control room, such as alarms, to alert the operator to an abnormal PV LCS air pressure condition.

SR 3.6.1.8.2

A simulated system operation is performed every [18] months to ensure that the PV LCS will function throughout its operating sequence. This includes correct automatic positioning of valves once the system is initiated manually. Proper functioning of the compressor and valves is verified by this Surveillance. The [18] month Frequency was developed considering it is prudent that many Surveillances be performed only during a plant outage. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [15.6.5].

Insert 2

BWR/6 LCO 3.6.1.9 MSIV LCS

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.

3.6 CONTAINMENT SYSTEMS

3.6.1.9 Main Steam Isolation Valve (MSIV) Leakage Control System (LCS)

LCO 3.6.1.9 Two MSIV LCS subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One MSIV LCS subsystem inoperable.	A.1 Restore MSIV LCS subsystem to OPERABLE status.	30 days
B. Two MSIV LCS subsystems inoperable.	B.1 Restore one MSIV LCS subsystem to OPERABLE status.	7 days
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	12 hours
	C.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.9.1 Operate each MSIV LCS blower \geq [15] minutes.	31 days
SR 3.6.1.9.2 Verify electrical continuity of each inboard MSIV LCS subsystem heater element circuitry.	31 days
SR 3.6.1.9.3 Perform a system functional test of each MSIV LCS subsystem.	[18] months

BASES

LCO One MSIV LCS subsystem can provide the required processing of the MSIV leakage. To ensure that this capability is available, assuming worst case single failure, two MSIV LCS subsystems must be OPERABLE.

APPLICABILITY In MODES 1, 2, and 3, a DBA could lead to a fission product release to primary containment. Therefore, MSIV LCS 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 MSIV LCS OPERABLE is not required in MODE 4 or 5 to ensure MSIV leakage is processed.

ACTIONS

A.1

With one MSIV LCS subsystem inoperable, the inoperable MSIV LCS subsystem must be restored to OPERABLE status within 30 days. In this Condition, the remaining OPERABLE MSIV LCS subsystem is adequate to perform the required leakage control function. However, the overall reliability is reduced because a single failure in the remaining subsystem could result in a total loss of MSIV leakage control function. The 30 day Completion Time is based on the redundant capability afforded by the remaining OPERABLE MSIV LCS subsystem and the low probability of a DBA LOCA occurring during this period.

B.1

With two MSIV LCS subsystems inoperable, at least one subsystem must be restored to OPERABLE status within 7 days. The 7 day Completion Time is based on the low probability of the occurrence of a DBA LOCA.

C.1 and C.2

Overall plant risk is minimized

If the MSIV LCS subsystem 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. (15)

Insert 1

BASES

SURVEILLANCE
REQUIREMENTS

SR 3.6.1.9.1

Each MSIV LCS blower is operated for \geq [15] minutes to verify OPERABILITY. The 31 day Frequency was developed considering the known reliability of the LCS blower and controls, the two subsystem redundancy, and the low probability of a significant degradation of the MSIV LCS subsystem occurring between surveillances and has been shown to be acceptable through operating experience.

SR 3.6.1.9.2

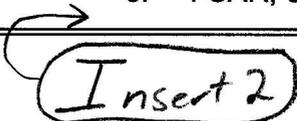
The electrical continuity of each inboard MSIV LCS subsystem heater is verified by a resistance check, by verifying the rate of temperature increase meets specifications, or by verifying the current or wattage draw meets specifications. The 31 day Frequency is based on operating experience that has shown that these components usually pass this Surveillance when performed at this Frequency.

SR 3.6.1.9.3

A system functional test is performed to ensure that the MSIV LCS will operate through its operating sequence. This includes verifying that the automatic positioning of the valves and the operation of each interlock and timer are correct, that the blowers start and develop the required flow rate and the necessary vacuum, and the upstream heaters meet current or wattage draw requirements (if not used to verify electrical continuity in SR 3.6.1.9.2). The 18 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 that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [6.7].
2. Regulatory Guide 1.96, Revision [1].
3. FSAR, Section [15.6.5].



BWR/6 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.

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.

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
<i>C</i> B. Two RHR suppression pool cooling subsystems inoperable.	<i>B.1</i> Restore one RHR suppression pool cooling subsystem to OPERABLE status.	8 hours
<i>D</i> C. Required Action and associated Completion Time of not met. <i>Condition C</i>	<i>C.1</i> Be in MODE 3. AND <i>C.2</i> Be in MODE 4.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.2.3.1 Verify each RHR suppression pool cooling subsystem manual, power operated, and automatic 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.	31 days

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

BASES

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 the 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 the pump, two heat exchangers, and associated piping, valves, instrumentation, and controls are OPERABLE.

APPLICABILITY In MODES 1, 2, and 3, a DBA could cause a release of radioactive material to primary containment and cause 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.

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 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.

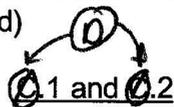
Insert 1



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.

BASES

ACTIONS (continued)



of Condition C

If the Required Action and required 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.

SURVEILLANCE
REQUIREMENTS

SR 3.6.2.3.1

Verifying the correct alignment for manual, power operated, and automatic 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 being locked, sealed, or secured. 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.

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 subsystem is a manually initiated system. This Frequency has been shown to be acceptable, based on operating experience.

SR 3.6.2.3.2

Verifying each RHR pump develops a flow rate \geq [7450] gpm, while operating in the suppression pool cooling mode with flow through the associated heat exchanger at least every 92 days, ensures that pump performance has not degraded during the cycle. Flow is a normal test of centrifugal pump performance required by ASME Section XI (Ref. ②). ③ This test confirms one point on the pump design curve, and the results are indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient

BASES

SURVEILLANCE REQUIREMENTS (continued)

failures by indicating abnormal performance. The Frequency of this SR is [in accordance with the Inservice Testing Program or 92 days].

REFERENCES

1. FSAR, Section [6.2].

Insert 2

→
⑤

ASME, Boiler and Pressure Vessel Code, Section XI.

BWR/6 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.

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 [primary or 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
	B.2 Be in MODE 4.	36 hours
C. [[Secondary containment] inoperable during movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs.	C.1 ----- - NOTE - LCO 3.0.3 is not applicable. ----- Suspend movement of [recently] irradiated fuel assemblies in the [primary and secondary containment]. AND	Immediately

BASES

APPLICABILITY (continued)

Service During Shutdown Conditions", subheading "Containment - Primary (PWR)/Secondary (BWR)".

"The following guidelines are included in the assessment of systems removed from service during movement of irradiated fuel:

- During fuel handling/core alterations, ventilation system and radiation monitor availability (as defined in NUMARC 91-06) should be assessed, with respect to filtration and monitoring of releases from the fuel. Following shutdown, radioactivity in the fuel decays away fairly rapidly. The basis of the Technical Specification operability amendment is the reduction in doses due to such decay. The goal of maintaining ventilation system and radiation monitor availability is to reduce doses even further below that provided by the natural decay.

- A single normal or contingency method to promptly close primary or secondary containment penetrations should be developed. Such prompt methods need not completely block the penetration or be capable of resisting pressure.

The purpose of the "prompt methods" mentioned above are to enable ventilation systems to draw the release from a postulated fuel handling accident in the proper direction such that it can be treated and monitored."

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

If the [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

Overall plant risk is minimized

BASES

Insert 1

ACTIONS (continued)

within 36 hours The allowed Completion Times ⁹ ~~are~~ ¹⁵ 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 and C.2

Movement of [recently] irradiated fuel assemblies in the [primary or 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 these activities 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 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.]

SURVEILLANCE
REQUIREMENTS

[SR 3.6.4.1.1

This SR ensures that the [secondary containment] boundary is sufficiently leak tight to preclude exfiltration under expected wind conditions. The 24 hour Frequency of this SR was developed based on operating experience related to [secondary containment] vacuum variations during the applicable MODES and the low probability of a DBA occurring between surveillances.

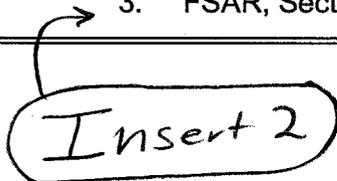
Furthermore, the 24 hour Frequency is considered adequate in view of other indications available in the control room, including alarms, to alert the operator to an abnormal [secondary containment] vacuum condition.]

BASES

SURVEILLANCE REQUIREMENTS (continued)

demonstrates that the pressure in the [secondary] containment can be maintained \geq [0.266] inches of vacuum water gauge for one hour using one SGT subsystem at a flow rate \leq [4000] cfm. The 1 hour test period allows [secondary] containment to be in thermal equilibrium at steady state conditions. The primary purpose of these SR[s] is to ensure [secondary] containment boundary integrity. The secondary purpose of these SR[s] is to ensure that the SGT subsystem being tested functions as designed. There is a separate LCO with Surveillance Requirements which serves the primary purpose of ensuring OPERABILITY of the SGT System. These SR[s] need not be performed with each SGT subsystem. The SGT subsystem used for these Surveillance[s] is staggered to ensure that in 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 these Surveillance[s] relative to the [secondary] containment OPERABILITY. Operating experience has shown the [secondary] containment boundary usually passes these Surveillance[s] when performed at the [18] month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

-
- REFERENCES
1. FSAR, Section [15.6.5].
 2. FSAR, Section [15.7.6].
 3. FSAR, Section [15.7.4].

Insert 2

BWR/6 LCO 3.6.4.3 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. 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

Therefore, 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. 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. 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 3

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

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 [primary or 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
	B.2 Be in MODE 4.	36 hours
C. Required Action and associated Completion Time of Condition A not met during movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs.	----- - NOTE - LCO 3.0.3 is not applicable. -----	
	C.1 Place OPERABLE SGT subsystem in operation.	Immediately
	<u>OR</u> C.2.1 Suspend movement of [recently] irradiated fuel assemblies in the [primary and secondary containment].	Immediately
	<u>AND</u>	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	C.2.2 Initiate action to suspend OPDRVs.	Immediately
D. Two SGT subsystems inoperable in MODE 1, 2, or 3.	D.1 Enter LCO 3.0.3. Be in MODE 3.	Immediately 12 hours
E. Two SGT subsystems inoperable during movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs.	E.1 ----- - NOTE - LCO 3.0.3 is not applicable. ----- Suspend movement of [recently] irradiated fuel assemblies in the [primary and secondary containment]. <u>AND</u> E.2 Initiate action to suspend OPDRVs.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.3.1	Operate each SGT subsystem for ≥ [10] continuous hours [with heaters operating].	31 days
SR 3.6.4.3.2	Perform required SGT filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.6.4.3.3	Verify each SGT subsystem actuates on an actual or simulated initiation signal.	[18] months
SR 3.6.4.3.4	[Verify each SGT filter cooler bypass damper can be opened and the fan started.	[18] months]

BASES

APPLICABILITY (continued)

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 [] days.)

ACTIONS

A.1

With one SGT subsystem inoperable, the inoperable subsystem must be restored to OPERABLE status within 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 subsystem and the low probability of a DBA occurring during this period.

B.1 and B.2

Overall plant risk is minimized

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 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, C.2.1, and C.2.2

During movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs, when Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE SGT subsystem should be immediately placed in operation. This Required Action ensures that the remaining subsystem is OPERABLE, that no failures that could prevent automatic actuation have occurred, 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 unit in a Condition that minimizes risk. If applicable, movement of [recently] irradiated fuel assemblies must be immediately suspended. Suspension

BASES

ACTIONS (continued)

of these activities shall not preclude completion of movement of a component to a safe position. Also, if applicable, action must be immediately initiated to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Action 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 SGT subsystems are inoperable in MODE 1, 2, or 3, the SGT system may not be capable of supporting the required radioactivity release control function. Therefore, actions are required to enter LCO 3.0.3 immediately.

Insert 2

E.1 and E.2

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

Required Action E.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 sufficient reason to require a reactor shutdown.

BASES

- REFERENCES
1. 10 CFR 50, Appendix A, GDC 41.
 2. FSAR, Section [6.2.3].
 3. FSAR, Section [15.6.5].
-
-

Insert 3

BWR/6 LCO 3.6.5.6 Drywell Vacuum Relief System

INSERT 1

D.1

If one [or two] drywell post-LOCA vacuum relief subsystems are inoperable for reasons other than not being closed or one drywell purge vacuum relief subsystem is inoperable for reasons other than not being closed, 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. 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.

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.

3.6 CONTAINMENT SYSTEMS

3.6.5.6 Drywell Vacuum Relief System

LCO 3.6.5.6 [Two] drywell post-LOCA and [two] drywell purge vacuum relief subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

- NOTE -

Enter applicable Conditions and Required Actions of LCO 3.6.5.1, "Drywell," when inoperable drywell purge vacuum relief subsystem(s) results in exceeding overall drywell bypass leakage rate acceptance criteria.

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. ----- - NOTE - Separate Condition entry is allowed for each vacuum relief subsystem. -----</p> <p>One or more vacuum relief subsystems not closed.</p>	A.1 Close the subsystem.	4 hours
B. One or [two] drywell post-LOCA vacuum relief subsystems inoperable for reasons other than Condition A.	B.1 Restore drywell post-LOCA vacuum relief subsystem(s) to OPERABLE status.	30 days
C. One drywell purge vacuum relief subsystem inoperable for reasons other than Condition A.	C.1 Restore drywell purge vacuum relief subsystem to OPERABLE status.	30 days

D. Required Action and associated Completion Time of Condition B or C not met. 0.1 Be in MODE 3. 12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E [ⓓ]. [Two] drywell purge vacuum relief subsystems inoperable for reasons other than Condition A.</p>	<p>[ⓓ].1 E Restore one drywell purge vacuum relief subsystem to OPERABLE status.</p>	<p>72 hours</p>
<p>[ⓔ]. [Two] drywell post-LOCA vacuum relief subsystems inoperable for reasons other than Condition A.</p> <p><u>AND</u></p> <p>One drywell purge vacuum relief subsystem inoperable for reasons other than Condition A.</p>	<p>[ⓔ].1 F Restore one drywell post-LOCA vacuum relief or drywell purge vacuum relief subsystem to OPERABLE status.</p>	<p>72 hours</p>
<p>[ⓕ]. Required Action and associated Completion Time of Condition A, [ⓔ]. C, D, or E, not met. <u>or F</u></p>	<p>[ⓕ].1 G Be in MODE 3.</p> <p><u>AND</u></p> <p>[ⓕ].2 G Be in MODE 4.</p>	<p>12 hours</p> <p>36 hours</p>
<p>H [ⓖ]. [Two] drywell purge vacuum relief subsystems inoperable for reasons other than Condition A.</p> <p><u>AND</u></p> <p>One or [two] drywell post-LOCA vacuum relief subsystems inoperable for reasons other than Condition A.</p>	<p>[ⓖ].1 H Be in MODE 3.</p> <p><u>AND</u></p> <p>[ⓖ].2 H Be in MODE 4.</p>	<p>12 hours</p> <p>36 hours</p>

BASES

ACTIONS (continued)

perform the depressurization mitigation function since two [10] inch lines remain available. The 30 day Completion Time takes into account the redundant capability afforded by the remaining subsystems, a reasonable time for repairs, and the low probability of an event requiring the vacuum relief subsystems to function occurring during this period.

Insert 1 →

~~D.1 and E.1~~ and ~~F.1~~

With [two] drywell purge vacuum relief subsystems inoperable or with [two] drywell post-LOCA and one drywell purge vacuum relief subsystems inoperable, for reasons other than being not closed, at least one inoperable subsystem must be restored to OPERABLE status within 72 hours. In these Conditions, only one [10] inch line remains available. The 72 hour Completion Time takes into account at least one vacuum relief subsystem is still OPERABLE, a reasonable time for repairs, and the low probability of an event requiring the vacuum relief subsystems to function occurring during this period.

~~F.1, F.2, G.1, and G.2~~, ~~H.1 and H.2~~

If the inoperable drywell vacuum relief subsystem(s) cannot be closed or restored to OPERABLE status within the required Completion Time, or if two drywell purge vacuum relief subsystems are inoperable, for reasons other than being not closed, and ~~one~~ two drywell post-LOCA vacuum relief subsystem(s) are inoperable, for reasons other than being not closed, 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.

SURVEILLANCE
REQUIREMENTS

SR 3.6.5.6.1

Each vacuum breaker and its associated isolation valve is verified to be closed to ensure that this potential large bypass leakage path is not present. This Surveillance is performed by observing the vacuum breaker or associated isolation valve position indication or by verifying that the vacuum breakers are closed when a differential pressure of [1.0] psid between the drywell and primary containment is maintained for 1 hour without makeup. The 7 day Frequency is based on engineering judgment, is considered adequate in view of other indications of vacuum

BASES

SURVEILLANCE REQUIREMENTS (continued)

breaker or isolation valve status available to the plant personnel, and has been shown to be acceptable through operating experience.

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

SR 3.6.5.6.2

Each vacuum breaker and its associated isolation valve must be cycled to ensure that it opens adequately to perform its design function and returns to the fully closed position. This provides assurance that the safety analysis assumptions are valid. A 31 day Frequency was chosen to provide additional assurance that the vacuum breakers and their associated isolation valves are OPERABLE.

SR 3.6.5.6.3

Verification of the vacuum breaker opening setpoint is necessary to ensure that the safety analysis assumption that the vacuum breaker will open fully at a differential pressure of [1.0] psid is valid. The [18] 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 [18] month Frequency, which is based on the refueling cycle. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section [6.2].

Insert 2

BWR/6 LCO 3.7.1 SSW System and UHS

INSERT 1

C.1

If one or more cooling towers with one cooling tower fan are inoperable or one SSW subsystem is inoperable for reasons other than Condition A 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. 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. 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

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

3.7 PLANT SYSTEMS

3.7.1 [Standby Service Water (SSW)] System and [Ultimate Heat Sink (UHS)]

LCO 3.7.1 Division 1 and 2 [SSW] subsystems and [UHS] shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. [One or more cooling towers with one cooling tower fan inoperable.	A.1 Restore cooling tower fan(s) to OPERABLE status.	7 days]
<p>----- - REVIEWER'S NOTE - The []°F is the maximum allowed UHS temperature value and is based on temperature limitations of the equipment that is relied upon for accident mitigation and safe shutdown of the unit. -----</p> <p>ⓑ [Water temperature of the UHS > [90]°F and ≤ []°F. ⓓ</p>	<p>ⓑ.1 ⓓ Verify water temperature of the UHS is ≤ [90]°F averaged over the previous 24 hour period.</p>	<p>Once per hour]</p> <p><i>< Move to next page ></i></p>

C. Required Action and associated Completion Time of Condition A or B not met.

C.1 Be in MOOE 3. | 12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p> C One [SSW] subsystem inoperable [for reasons other than Condition A]. B </p>	<p> C.1 B <hr style="border-top: 1px dashed black;"/> <p style="text-align: center;">- NOTES -</p> <p>1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources - Operating," for diesel generator made inoperable by [SSW].</p> <p>2. Enter applicable Conditions and Required Actions of LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown," for [RHR shutdown cooling] made inoperable by [SSW].</p> <hr style="border-top: 1px dashed black;"/> <p>Restore [SSW] subsystem to OPERABLE status.</p> </p>	<p style="text-align: center;">72 hours</p>
<p> E D Required Action and associated Completion Time of Condition A B C not met. D <u>OR</u> Both [SSW] subsystems inoperable [for reasons other than Condition A]. <u>[OR</u> [UHS] inoperable for reasons other than Condition A [or B.] D </p>	<p> D.1 E <u>AND</u> D.2 E </p> <p>Be in MODE 3.</p> <p>Be in MODE 4.</p>	<p style="text-align: center;">12 hours</p> <p style="text-align: center;">36 hours</p>

< move to previous page >

BASES

ACTIONS

[A.1

If one or more cooling towers have one fan inoperable (i.e., up to one fan per cooling tower inoperable), action must be taken to restore the inoperable cooling tower fan(s) to OPERABLE status within 7 days.

The 7 day Completion Time is reasonable, based on the low probability of an accident occurring during the 7 days that one cooling tower fan is inoperable in one or more cooling towers, the number of available systems, and the time required to complete the Required Action.]

<move ↓>

ⓐ ⓑ

- REVIEWER'S NOTE -

The []°F is the maximum allowed UHS temperature value and is based on temperature limitations of the equipment that is relied upon for accident mitigation and safe shutdown of the unit.

With water temperature of the UHS > [90]°F, the design basis assumption associated with initial UHS temperature is bounded provided the temperature of the UHS averaged over the previous 24 hour period is ≤ [90]°F. With the water temperature of the UHS > [90]°F, long term cooling capability of the ECCS loads and DGs may be affected.

Therefore, to ensure long term cooling capability is provided to the ECCS loads when water temperature of the UHS is > [90]°F, Required Action ⓐ ⓑ is provided to more frequently monitor the water temperature of the UHS and verify the temperature is ≤ [90]°F when averaged over the previous 24 hour period. The once per hour Completion Time takes into consideration UHS temperature variations and the increased monitoring frequency needed to ensure design basis assumptions and equipment limitations are not exceeded in this condition. If the water temperature of the UHS exceeds [90]°F when averaged over the previous 24 hour period or the water temperature of the UHS exceeds []°F, Condition ⓓ must be entered immediately.] ⓔ

<move ↑>

ⓑ ⓐ.1

If one [SSW] subsystem is inoperable [for reasons other than Condition A], it must be restored to OPERABLE status within 72 hours. With the unit in this condition, the remaining OPERABLE [SSW] subsystem is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE [SSW] subsystem could result in loss of [SSW] function. The 72 hour Completion Time was developed taking into account the

BASES

ACTIONS (continued)

redundant capabilities afforded by the OPERABLE subsystem and the low probability of a DBA occurring during this period.

The Required Action is modified by two Notes indicating that the applicable Conditions of LCO 3.8.1, "AC Sources - Operating," and LCO 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown," be entered and the Required Actions taken if the inoperable [SSW] subsystem results in an inoperable DG or RHR shutdown cooling, respectively. This is in accordance with LCO 3.0.6 and ensures the proper actions are taken for these components.

Insert 1

Move D.1 to here

D.1 and D.2 (E) UHS water temperature is not within the limit in Condition O

If the [SSW] subsystem cannot be restored to OPERABLE status within the associated Completion Time, or both [SSW] subsystems are inoperable [for reasons other than Condition A], or the [[UHS] is (E) determined inoperable for reasons other than Condition A or (E), 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

This SR ensures adequate long term (30 days) cooling can be maintained. With the [UHS] water source below the minimum level, the affected [SSW] subsystem must be declared inoperable. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES.]

[SR 3.7.1.2

This SR verifies the water level [in each [SSW] pump well of the intake structure] to be sufficient for the proper operation of the [SSW] pumps (net positive suction head and pump vortexing are considered in determining this limit). The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES.]

BASES

SURVEILLANCE REQUIREMENTS (continued)

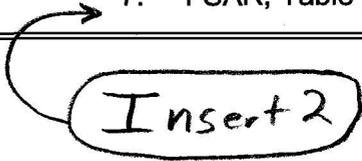
SR 3.7.1.6

This SR verifies that the automatic isolation valves of the [SSW] System will automatically switch to the safety or emergency position to provide cooling water exclusively to the safety related equipment during an accident event. This is demonstrated by use of an actual or simulated initiation signal. This SR also verifies the automatic start capability of the [SSW] pump and cooling tower fans in each subsystem. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.5.1.6 overlaps this SR to provide complete testing of the safety function.

Operating experience has shown that these components usually pass the SR when performed on the [18] month Frequency. Therefore, this Frequency is concluded to be acceptable from a reliability standpoint.

REFERENCES

1. Regulatory Guide 1.27, Revision 2, January 1976.
2. FSAR, Section [9.2.1].
3. FSAR, Table [9.2-3].
4. FSAR, Section [6.2.1.1.3.3.1.6].
5. FSAR, Chapter [15].
6. FSAR, Section [6.2.2.3].
7. FSAR, Table [6.2-2].



Insert 2

BWR/6 LCO 3.7.3 CRFA 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. 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.

INSERT 2

Therefore, 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. 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 3

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

3.7 PLANT SYSTEMS

3.7.3 [Control Room Fresh Air (CRFA)] System

LCO 3.7.3 Two [CRFA] subsystems shall be OPERABLE.

- NOTE -

The control room boundary may be opened intermittently under administrative control.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One [CRFA] subsystem inoperable.	A.1 Restore [CRFA] subsystem to OPERABLE status.	7 days
B. Two [CRFA] subsystems inoperable due to inoperable control room boundary in MODE 1, 2, or 3.	B.1 Restore control room boundary to OPERABLE status.	24 hours
C. Required Action and Associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>D. Required Action and associated Completion Time of Condition A not met during movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs.</p>	<p>----- - NOTE - LCO 3.0.3 is not applicable. -----</p>	
	<p>D.1 ----- - NOTE - [Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.] -----</p>	
	<p>Place OPERABLE [CRFA] subsystem in [isolation] mode.</p>	<p>Immediately</p>
	<p><u>OR</u></p> <p>D.2.1 Suspend movement of [recently] irradiated fuel assemblies in the [primary and secondary containment].</p> <p><u>AND</u></p> <p>D.2.2 Initiate action to suspend OPDRVs.</p>	<p>Immediately</p>
<p>E. Two [CRFA] subsystems inoperable in MODE 1, 2, or 3 for reasons other than Condition B.</p>	<p>E.1 Enter LCO 3.0.3. Be in MODE 3.</p>	<p>Immediately 12 hours</p>

BASES

ACTIONS (continued)

relative humidity, and physical security. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of compensatory measures. The 24 hour Completion Time is a typically reasonable time to diagnose, plan and possibly repair, and test most problems with the control room boundary.

C.1 (and ~~C.2~~)

In MODE 1, 2, or 3, if the inoperable [CRFA] subsystem or control room boundary 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~~ ^{is} 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

Insert 1

D.1, D.2.1 and D.2.2

The Required Actions of Condition D are modified by a Note indicating that LCO 3.0.3 does not apply. If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of [recently] irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs, if the inoperable [CRFA] subsystem cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE [CRFA] subsystem may be placed in the isolation mode. This action ensures that the remaining subsystem is OPERABLE, that no failures that would prevent automatic actuation will occur, and that any active failure will be readily detected.

Required Action D.1 is modified by a Note alerting the operator to [place the system in the toxic gas protection mode if the toxic gas, automatic transfer capability is inoperable].

An alternative to Required Action D.1 is to immediately suspend activities that present a potential for releasing radioactivity that might require

BASES

ACTIONS (continued)

isolation of the control room. This places the unit in a condition that minimizes risk.

If applicable, movement of [recently] irradiated fuel assemblies in the [primary and 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, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

E.1

If both [CRFA] subsystems are inoperable in MODE 1, 2, or 3 for reasons other than an inoperable control room boundary (i.e., Condition B), the [CRFA] System may not be capable of performing the intended function and the unit is in a condition outside of the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

Insert 2

F.1 and F.2

The Required Actions of Condition F are modified by a Note indicating that LCO 3.0.3 does not apply. If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of [recently] irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs, with two [CRFA] subsystems inoperable, 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, movement of [recently] irradiated fuel assemblies in the [primary and secondary containment] must be suspended immediately. Suspension of these activities shall not preclude completion of movement of a component to a safe position. If applicable, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission

BASES

ACTIONS (continued)

product release. Actions must continue until the OPDRVs are suspended.

SURVEILLANCE
REQUIREMENTS

SR 3.7.3.1

This SR verifies that a subsystem in a standby mode starts on demand and continues to operate. 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 each subsystem once every month provides an adequate check on this system. Monthly heater operation dries out any moisture accumulated in the charcoal from humidity in the ambient air. [Systems with heaters must be operated for ≥ 10 continuous hours with the heaters energized. Systems without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system.] Furthermore, the 31 day Frequency is based on the known reliability of the equipment and the two subsystem redundancy available.

SR 3.7.3.2

This SR verifies that the required CRFA testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. The [VFTP] includes testing HEPA filter performance, charcoal adsorber efficiency, minimum 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].

SR 3.7.3.3

This SR verifies that each [CRFA] subsystem starts and operates on an actual or simulated initiation signal. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.7.1.5 overlaps this SR to provide complete testing of the safety function. The [18] month Frequency is specified in Reference ~~8~~

SR 3.7.3.4

This SR verifies the integrity of the control room enclosure and the assumed inleakage rates of potentially contaminated air. The control room positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper function of the [CRFA] System. During the emergency mode of operation, the [CRFA] System is designed to slightly pressurize the control room to [0.1] inches water

BASES

SURVEILLANCE REQUIREMENTS (continued)

gauge positive pressure with respect to adjacent areas to prevent unfiltered inleakage. The [CRFA] System is designed to maintain this positive pressure at a flow rate of [500] cfm to the control room in the isolation mode. The Frequency of [18] months on a STAGGERED TEST BASIS is consistent with industry practice and other filtration system SRs.

REFERENCES

1. FSAR, Section [6.5.1].
 2. FSAR, Section [9.4.1].
 3. FSAR, Chapter [6].
 4. FSAR, Chapter [15].
- ⑥ Regulatory Guide 1.52, Rev. [2].

Insert 3

BWR/6 LCO 3.7.4 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. 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

Therefore, 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. 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 3

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

3.7 PLANT SYSTEMS

3.7.4 [Control Room Air Conditioning (AC)] System

LCO 3.7.4 Two [control room AC] subsystems shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One [control room AC] subsystem inoperable.	A.1 Restore [control room AC] subsystem 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
	B.2 Be in MODE 4.	36 hours
C. Required Action and associated Completion Time of Condition A not met during movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs.	----- - NOTE - LCO 3.0.3 is not applicable. -----	Immediately
	C.1 Place OPERABLE [control room AC] subsystem in operation.	
	<u>OR</u>	

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
	<p>C.2.1 Suspend movement of [recently] irradiated fuel assemblies in the [primary and secondary containment].</p> <p><u>AND</u></p> <p>C.2.2 Initiate action to suspend OPDRVs.</p>	<p>Immediately</p> <p>Immediately</p>
D. Two [control room AC] subsystems inoperable in MODE 1, 2, or 3.	<p>D.1 Enter LCO 3.0.3. <i>Be in MODE 3.</i></p>	<p>Immediately <i>12 hours</i></p>
E. Two [control room AC] subsystems inoperable during movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs.	<p>----- - NOTE - LCO 3.0.3 is not applicable. -----</p> <p>E.1 Suspend movement of [recently] irradiated fuel assemblies in the [primary and secondary containment].</p> <p><u>AND</u></p> <p>E.2 Initiate action to suspend OPDRVs.</p>	<p>Immediately</p> <p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.4.1 Verify each [control room AC] subsystem has the capability to remove the assumed heat load.	[18] months

BASES

ACTIONS (continued)

B.1 and B.2

Overall plant

In MODE 1, 2, or 3, if the inoperable [control room AC] subsystem 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. ⁽¹⁵⁾ based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

Insert 4

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

The Required Actions of Condition C are modified by a Note indicating that LCO 3.0.3 does not apply.

If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of [recently] irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs, if Required Action A.1 cannot be completed within the required Completion Time, the OPERABLE [control room AC] subsystem may be placed immediately in operation. This action ensures that the remaining subsystem is OPERABLE, that no failures that would prevent actuation will occur, and that any active failure will be readily detected.

An alternative to Required Action C.1 is to immediately 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, movement of [recently] irradiated fuel assemblies in the [primary and 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, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

BASES

ACTIONS (continued)

D.1

If both [control room AC] subsystems are inoperable in MODE 1, 2, or 3, the [Control Room AC] System may not be capable of performing the intended function. Therefore, LCO 3.0.3 must be entered immediately.

E.1 and E.2

Insert 2

The Required Actions of Condition E.1 are modified by a Note indicating that LCO 3.0.3 does not apply. If moving [recently] irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of [recently] irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

During movement of [recently] irradiated fuel assemblies in the [primary or secondary containment] or during OPDRVs with two [control room AC] subsystems inoperable, action must be taken to immediately 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, handling of [recently] irradiated fuel in the [primary or 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, actions must be initiated immediately to suspend OPDRVs to minimize the probability of a vessel draindown and subsequent potential for fission product release. Actions must continue until the OPDRVs are suspended.

SURVEILLANCE
REQUIREMENTS

SR 3.7.4.1

This SR verifies that the heat removal capability of the system is sufficient to remove the control room heat load assumed in the [safety analyses]. The SR consists of a combination of testing and calculation. The [18] month Frequency is appropriate since significant degradation of the [Control Room AC] System is not expected over this time period.

REFERENCES

1. FSAR, Section [6.4].

BASES

REFERENCES (continued)

2. FSAR, Section [9.4.1].

Insert 3

BWR/6 LCO 3.7.5 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. 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.

3.7 PLANT SYSTEMS

3.7.5 Main Condenser Offgas

LCO 3.7.5 The gross gamma activity rate of the noble gases measured at [the offgas recombiner effluent] shall be \leq [380] mCi/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 mainsteam lines.	12 hours]
	<u>OR</u>	
	B.2 Isolate SJAE.	12 hours
	<u>OR</u>	
	B.3 1 Be in MODE 3.	12 hours
	<u>AND</u>	
	B.3.2 Be in MODE 4.	36 hours

BASES

APPLICABILITY (continued)

during MODES 2 and 3 with any main steam line not isolated and the SJAE in operation. In MODES 4 and 5, steam is not being exhausted to the main condenser and the requirements are not applicable.

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 considering 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 occurring.

^{2nd}
B.1, B.2, B.3.1, and B.3.2

If the gross gamma activity rate is not restored to within the limits within the associated Completion Time, [all main steam lines] or the SJAE must be isolated. This isolates the Main Condenser Offgas System from the source of the 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.

Overall plant risk is minimized

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.

Insert 1

SURVEILLANCE
REQUIREMENTS

SR 3.7.5.1

This SR, on a 31 day Frequency, requires an isotopic analysis of an offgas sample to ensure that the required limits are satisfied. The noble gases to be sampled are Xe-133, Xe-135, Xe-138, Kr-85, Kr-87, and Kr-88. If the measured rate of radioactivity increases significantly (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

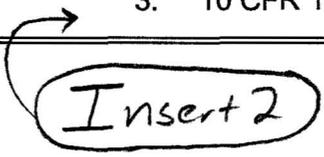
BASES

SURVEILLANCE REQUIREMENTS (continued)

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.

-
- REFERENCES
1. FSAR, Section [15.7.1].
 2. NUREG-0800.
 3. 10 CFR 100.



Insert 2

BWR/6 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. 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 2

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

ACTIONS (continued)

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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.1.1 Verify correct breaker alignment and indicated power availability for each [required] offsite circuit.	7 days
<p>SR 3.8.1.2 -----</p> <p style="text-align: center;">- NOTES -</p> <p>1. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading.</p> <p>[2. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met.]</p> <p>-----</p> <p>Verify each DG starts from standby conditions and achieves steady state voltage \geq [3744] V and \leq [4576] V and frequency \geq [58.8] Hz and \leq [61.2] Hz.</p>	31 days

BASES

ACTIONS (continued)

loads under any conditions. Implicit in this Note is the concept that the Condition must be retained if any sequencer failure mode results in the inability to start all or part of the safety loads when required, regardless of power availability, or results in overloading the offsite power circuit to a safety bus during an event thereby causing its failure. Also implicit in the Note is the concept that the Condition is not applicable to any Division that does not have a sequencer [Division 3 does not normally have a sequencer in the circuitry].]

G.1 and G.2

Overall plant risk is minimized

If the inoperable AC electrical power sources [and sequencers] 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 unit must be brought to MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times

13

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

H.1

Condition H 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.

SURVEILLANCE
REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, GDC 18 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages under simulated accident conditions. The SRs for demonstrating the OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide 1.9 (Ref. 3), Regulatory Guide 1.108 (Ref. 9), and Regulatory Guide 1.137 (Ref. 10).

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Where the SRs discussed herein specify voltage and frequency tolerances, the following summary is applicable. The minimum steady state output voltage of [3740] V is 90% of the nominal 4160 V output voltage. This value, which is specified in ANSI C84.1 (Ref. 11), allows for voltage drop to the terminals of 4000 V motors whose minimum operating

12

BASES

SURVEILLANCE REQUIREMENTS (continued)

warmup be limited to this lower speed, and that DGs be gradually accelerated to synchronous speed prior to loading. These start procedures are the intent of Note 2, which is only applicable when such procedures are recommended by the manufacturer.]

SR 3.8.1.7 requires that, at a 184 day Frequency, the DG starts from standby conditions and achieves required voltage and frequency within 10 seconds. The 10 second start requirement supports the assumptions in the design basis LOCA analysis (Ref. 10). The 10 second start requirement may not be 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 10 second start requirement of SR 3.8.1.7 applies. Since SR 3.8.1.7 does require a 10 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 to the SR requirements, 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.

The 31 day Frequency for SR 3.8.1.2 is consistent with Regulatory Guide 1.9 (Ref. 3). The 184 day Frequency for SR 3.8.1.7 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 demonstrates that the DGs are capable of synchronizing and accepting greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperatures, while minimizing the time that the DG is connected to the offsite source.

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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. 10). This SR is for 11 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.

SR 3.8.1.6

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

[The Frequency for this SR is variable, depending on individual system design, with up to a 92 day interval. The 92 day Frequency corresponds to the testing requirements for pumps as contained in the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 12); however, the design of 13 fuel transfer systems is such that pumps operate automatically or must be started manually in order to maintain an adequate volume of fuel oil in the day [and engine mounted] tanks during or following DG testing. In such a case, a 31 day Frequency is appropriate. Since proper operation of fuel transfer systems is an inherent part of DG OPERABILITY, the Frequency of this SR should be modified to reflect individual designs.]

SR 3.8.1.7

See SR 3.8.1.2.

[SR 3.8.1.8

Transfer of each 4.16 kV ESF bus power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. The [18 month] Frequency of the Surveillance is based on engineering judgment taking into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed on the [18 month]

BASES

SURVEILLANCE REQUIREMENTS (continued)

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

As required by IEEE-308 (Ref. ¹³), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower. For the Grand Gulf Nuclear Station these values are the same.

The time, voltage, and frequency tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 3) recommendations for response during load sequence intervals. The 3 seconds specified is equal to 60% of the 5 second load sequence interval associated with sequencing of this largest load. The voltage and frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the maximum frequency excursion, while SR 3.8.1.9.b and SR 3.8.1.9.c are steady state voltage and frequency values to which the system must recover following load rejection. The [18 month] Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. ⁹).

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

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, testing must be performed using a power factor $\leq [0.9]$. This power factor is chosen to be representative of the actual design basis inductive loading that the DG would experience.

The [18 month] Frequency is consistent with the recommendation of Regulatory Guide 1.108 (Ref. 9) and is intended to be consistent with expected fuel cycle lengths. (10)

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

- REVIEWER'S NOTE -

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

- a. Performance of the SR will not render any safety system or component inoperable,
 - b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and
 - c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.
-

SR 3.8.1.11

As required by Regulatory Guide 1.108 (Ref. ¹⁰9), paragraph 2.a.(1), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG auto-start time of 10 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved.

The requirement to verify the connection and power supply of permanent and auto-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, ECCS injection valves are not desired to be stroked open, systems are not capable of being operated at full flow, or RHR systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of 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 [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. ¹⁰9), paragraph 2.a.(1), takes into

BASES

SURVEILLANCE REQUIREMENTS (continued)

- REVIEWER'S NOTE -

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

- a. Performance of the SR will not render any safety system or component inoperable,
- b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and
- c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.

SR 3.8.1.14

Regulatory Guide 1.108 (Ref. ¹⁰), paragraph 2.a.(3), requires demonstration once per 18 months 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 the continuous rating of the DG, and 2 hours of which is at a load equivalent to 110% of the continuous duty 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.

In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing must be performed using a power factor $\leq [0.9]$. This power factor is chosen to be representative of the actual design basis inductive loading that the DG could experience.

The [18 month] Frequency is ¹⁰ consistent with the recommendations of Regulatory Guide 1.108 (Ref. ¹⁰), paragraph 2.a.(3); takes into consideration plant conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by three Notes. Note 1 states that momentary transients due to changing bus loads do not invalidate this test. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in

BASES

SURVEILLANCE REQUIREMENTS (continued)

Surveillances, and achieve the required voltage and frequency within 10 seconds. The 10 second time is derived from the requirements of the accident analysis to respond to a design basis large break LOCA.

The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. ⑩), paragraph 2.a.(5).

This SR has been modified by two 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 full load conditions prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. The load band is provided to avoid routine overloading of the DG. Routine overloads may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.

SR 3.8.1.16

As required by Regulatory Guide 1.108 (Ref. ⑩), paragraph 2.a.(6), this Surveillance ensures that the manual synchronization and automatic load transfer from the DG to the offsite source can be made and 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 load sequence timers are reset.

The Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.108 (Ref. ⑩), paragraph 2.1.(6), and takes into consideration plant conditions required to perform the Surveillance.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated

BASES

SURVEILLANCE REQUIREMENTS (continued)

OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

SR 3.8.1.17

Demonstration of the test mode override ensures that the DG availability under accident conditions is not compromised as the result of testing. Interlocks to the LOCA sensing circuits cause the DG to automatically reset to ready-to-load operation if an ECCS initiation signal is received during operation in the test mode. Ready-to-load operation is defined as the DG running at rated speed and voltage with the DG output breaker open. These provisions for automatic switchover are required by IEEE-308 (Ref. ⁽¹³⁾), paragraph 6.2.6(2).

⁽¹⁴⁾
The requirement to automatically energize the emergency loads with offsite power is essentially identical to that of SR 3.8.1.12. The intent in the requirement associated with SR 3.8.1.17.b is to show that the emergency loading is not affected by the DG operation in test mode. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the emergency loads to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

⁽¹⁵⁾
The [18 month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. ⁽⁹⁾), paragraph 2.a.(8); takes into consideration plant conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.

This SR has been modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to

BASES

SURVEILLANCE REQUIREMENTS (continued)

be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

SR 3.8.1.18

Under accident conditions [and loss of offsite power] loads are sequentially connected to the bus by the load sequencing panel. 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 tolerance ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load and that safety analysis assumptions regarding ESF equipment time delays are not violated. Reference 2 provides a summary of the automatic loading of ESF buses.

The Frequency of [18 months]⁽¹⁰⁾ is consistent with the recommendations of Regulatory Guide 1.108 (Ref. ⁽⁹⁾), paragraph 2.a.(2); 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 that performing the Surveillance during these MODES would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge plant safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and

BASES

SURVEILLANCE REQUIREMENTS (continued)

The Frequency of [18 months] takes into consideration plant conditions required to perform the Surveillance and is intended to be consistent with an expected fuel cycle length of [18 months].

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil being continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge plant safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

SR 3.8.1.20

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

The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. ⑩). ⑩

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

and oil continuously circulated and temperature maintained consistent with manufacturer recommendations.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
 2. FSAR, Chapter [8].
 3. Regulatory Guide 1.9.
 4. FSAR, Chapter [6].
 5. FSAR, Chapter [15].
 6. Regulatory Guide 1.93.
 7. Generic Letter 84-15, July 2, 1984.
 - 9 ⑧ 10 CFR 50, Appendix A, GDC 18.
 - 10 ⑩ Regulatory Guide 1.108.
 - 11 ⑪ Regulatory Guide 1.137.
 - 12 ⑫ ANSI C84.1, 1982.
 - 13 ⑬ ASME, Boiler and Pressure Vessel Code, Section XI.
 - 14 ⑭ IEEE Standard 308.
-
-

Insert 2 →

BWR/6 LCO 3.8.4 DC Sources - Operating

INSERT 1

D.1

If a Division 1 or 2 DC electrical power subsystem 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. 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. 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

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

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

LCO 3.8.4 The [Division 1], [Division 2], and [Division 3] DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One [or two] battery charger[s on one division] inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage.	2 hours
	<u>AND</u>	
	A.2 Verify battery float current ≤ [2] amps.	Once per [12] hours
	<u>AND</u>	
	A.3 Restore battery charger[s] to OPERABLE status.	7 days
[B. One [or two] batter[y][ies on one division] inoperable.	B.1 Restore batter[y][ies] to OPERABLE status.	[2] hours]
C. [Division 1 or 2] DC electrical power subsystem inoperable for reasons other than Condition A [or B].	C.1 Restore [Division 1 and 2] DC electrical power subsystems to OPERABLE status.	[2] hours

D. Required Action and associated Completion Time for C [Division 1 or 2] DC electrical power subsystem for Condition A, B, or C not met.

D.1 Be in MODE 3.

12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>D ^E [Division 3] DC electrical power subsystem inoperable for reasons other than Condition A [or B].</p>	<p>D.1 ^E Declare High Pressure Core Spray System [and 2C Standby Service Water System] inoperable.</p>	Immediately
<p>^F E Required Action and associated Completion Time not met.</p>	<p>E.1 Be in MODE 3.</p>	12 hours
<p>for [Division 3] DC electrical power subsystem for Condition A, B, or E</p>	<p>AND E.2 Be in MODE 4.</p>	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.4.1 Verify battery terminal voltage is greater than or equal to the minimum established float voltage.</p>	7 days
<p>SR 3.8.4.2 Verify each [required] battery charger supplies \geq [400] amps at greater than or equal to the minimum established float voltage for \geq [8] hours.</p> <p>OR</p> <p>Verify each battery charger can recharge the battery to the fully charged state within [24] hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.</p>	[18 months]

BASES

ACTIONS (continued)

complete loss of DC power to the affected division. The 2 hour limit is consistent with the allowed time for an inoperable DC distribution system division.

If one of the required [Division 1 or 2] DC electrical power subsystems is inoperable for reasons other than Condition A or B (e.g., inoperable battery charger and associated inoperable battery), the remaining DC electrical power subsystems have the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst case single failure could, however, result in the loss of minimum necessary DC electrical subsystems, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 7) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and, if the DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown.

Insert 1 → ~~E.1~~

With the Division 3 DC electrical power subsystem inoperable for reasons other than Condition A or B, the HPCS and 2C Standby Service Water System may be incapable of performing their intended functions and must be immediately declared inoperable. This declaration also requires entry into applicable Conditions and Required Actions of LCO 3.5.1, "ECCS - Operating," [and LCO 3.7.1, "Standby Service Water (SSW) System and [Ultimate Heat Sink (UHS)"]].

~~A.1 and A.2~~

Division 3

If the inoperable DC electrical power 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. The Completion Time to bring the unit to MODE 4 is consistent with the time required in Regulatory Guide 1.93 (Ref. 7).

BASES

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 battery chargers, which support 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 while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer ([2.20] Vpc or [127.6] V at the battery terminals). This voltage maintains the battery plates in a condition that supports maintaining the grid life (expected to be approximately 20 years). The 7 day Frequency is consistent with manufacturer recommendations and IEEE-450 (Ref. ⑧).

SR 3.8.4.2

This SR verifies the design capacity of the battery chargers. According to Regulatory Guide 1.32 (Ref. ⑩), the battery charger supply is recommended 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.

This SR provides two options. One option requires that each battery charger be capable of supplying [400] amps at the minimum established float voltage for [8] hours. The ampere requirements are based on the output rating of the chargers. The voltage requirements are based on the charger voltage level after a response to a loss of AC power. The time period is sufficient for the charger temperature to have stabilized and to have been maintained for at least [2] hours.

The other option requires that each battery charger be capable of recharging the battery after a service test coincident with supplying the largest coincident demands of the various continuous steady state loads (irrespective of the status of the plant during which these demands occur). This level of loading may not normally be available following the battery service test and will need to be supplemented with additional loads. The duration for this test may be longer than the charger sizing criteria since the battery recharge is affected by float voltage,

BASES

SURVEILLANCE REQUIREMENTS (continued)

temperature, and the exponential decay in charging current. The battery is recharged when the measured charging current is \leq [2] amps.

The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these [18 month] intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

SR 3.8.4.3

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 discharge rate and test length corresponds to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency of [18 months] is ⁽¹⁰⁾ consistent with the recommendations of Regulatory Guide 1.32 (Ref. ⁽⁹⁾) and Regulatory Guide 1.129 (Ref. ⁽¹⁰⁾), which state that the battery service test should be performed during refueling operations or at some other outage, with intervals between tests not to exceed [18 months].

This SR is modified by two Notes. Note 1 allows the performance of a modified performance discharge test in lieu of a service test.

The reason for Note 2 is that performing the Surveillance would remove a required DC electrical power subsystem from service, perturb the electrical distribution system, and challenge safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of

BASES

SURVEILLANCE REQUIREMENTS (continued)

the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. Regulatory Guide 1.6.
3. IEEE Standard 308, 1978.
4. FSAR, Chapter [8].
5. FSAR, Chapter [6].
6. FSAR, Chapter [15].
7. Regulatory Guide 1.93, December 1974.
- 9 ~~8~~ IEEE Standard 450, 1995.
- 10 ~~9~~ Regulatory Guide 1.32, February 1977.
- 11 ~~10~~ Regulatory Guide 1.129, December 1974.

Insert 2 →

BWR/6 LCO 3.8.7 Inverters - Operating

INSERT 1

B.1

If a Division 1 or 2 inverter 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. 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. 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

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

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters - Operating

LCO 3.8.7 The [Division 1], [Division 2], and [Division 3] inverters shall be OPERABLE.

- NOTE -

[[One/two] inverter[s] may be disconnected from [its/their] associated DC bus for \leq [24] hours to perform an equalizing charge on [its/their] associated [common] battery, provided:

- a. The associated AC vital bus[es] [is/are] energized from [its/their] [Class 1E constant voltage transformers] [inverter using internal AC source] and
- b. All other AC vital buses are energized from their associated OPERABLE inverters.]

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. [Division 1 or 2] inverter inoperable.	<p>A.1</p> <p>----- - NOTE - Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating" with any AC vital bus de-energized. -----</p> <p>Restore [Division 1 and 2] inverters to OPERABLE status.</p>	24 hours

B. Required Action and associated Completion Time of Condition A not met. | *B.1 Be in MODE 3,* | *12 hours*

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B C [[Division 3] inverter inoperable.	B .1 C Declare High Pressure Core Spray System [and 2C Standby Service Water System] inoperable.	Immediately]
D C . Required Action and associated Completion Time not met. <u>of Condition C</u>	D .1 C AND	12 hours
	D .2 C Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage, [frequency,] and alignment to required AC vital buses.	7 days

BASES

APPLICABILITY (continued)

- a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients and
- b. Adequate core cooling is provided, and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

Inverter requirements for MODES 4 and 5 are covered in the Bases for LCO 3.8.8, "Inverters - Shutdown."

ACTIONS

A.1

With a required inverter inoperable, its associated AC vital bus becomes inoperable until it is manually re-energized from its [Class 1E constant voltage source transformer or inverter using internal AC source]. LCO 3.8.9 addresses this action; however, pursuant to LCO 3.0.6, these actions would not be entered even if the AC vital bus were de-energized. Therefore, the ACTIONS are modified by a Note stating that ACTIONS for LCO 3.8.9 must be entered immediately. This ensures the vital bus is re-energized within 2 hours.

Required Action A.1 allows 24 hours to fix the inoperable inverter and return it to service. The 24 hour limit is based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the plant is exposed because of the inverter inoperability. This risk has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems that such a shutdown might entail. When the AC vital bus is powered from its constant voltage source, it is relying upon interruptible AC electrical power sources (offsite and onsite). The uninterruptible inverter source to the AC vital buses is the preferred source for powering instrumentation trip setpoint devices.

Insert 1

① A.1

With the Division 3 inverter inoperable, the associated Division 3 ECCS subsystem may be incapable of performing intended function and must be immediately declared inoperable. This also requires entry into applicable Conditions and Required Actions for LCO 3.5.1, "ECCS - Operating."

BASES

ACTIONS (continued)

0.1 and 0.2

Division 3 inverter

If the inoperable devices or components cannot be restored to OPERABLE status within the associated 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.

SURVEILLANCE
REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and AC vital buses energized from the inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation connected to the AC vital buses. The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.

REFERENCES

1. FSAR, Chapter [8].
2. FSAR, Chapter [6].
3. FSAR, Chapter [15].

Insert 2

BWR/6 LCO 3.8.9 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.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more [Division 1 and 2] DC electrical power distribution subsystem inoperable.	C.1 Restore [Division 1 and 2] DC electrical power distribution subsystem(s) to OPERABLE status.	2 hours <u>AND</u> 16 hours from discovery of failure to meet LCO
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Be in MODE 3.	12 hours
	<u>AND</u> D.2 Be in MODE 4.	36 hours
E. One or more [Division 3] AC, DC, or AC vital bus electrical power distribution subsystems inoperable.	E.1 Declare High Pressure Core Spray System [and 2C Standby Service Water System] inoperable.	Immediately
F. Two or more electrical power distribution subsystems inoperable that result in a loss of function.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.9.1 Verify correct breaker alignments and voltage to [required] AC, DC, [and AC vital bus] electrical power distribution subsystems.	7 days

BASES

ACTIONS (continued)

D.1 and ~~D.2~~

Overall plant risk is minimized

If the inoperable electrical power distribution system cannot be restored to OPERABLE status within the associated Completion Times, 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

E.1

With the Division 3 electrical power distribution system inoperable, the Division 3 powered systems are not capable of performing their intended functions. Immediately declaring the high pressure core spray inoperable allows the ACTIONS of LCO 3.5.1, "ECCS - Operating," to apply appropriate limitations on continued reactor operation.

F.1

Condition F corresponds to a level of degradation in the electrical distribution system that causes a required safety function to be lost. (Single division systems are not included, although for this Action, Division 3 is considered redundant to Division 1 and 2 ECCS.) When two or more inoperable electrical power distribution subsystems result 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.

SURVEILLANCE
REQUIREMENTS

SR 3.8.9.1

Meeting this Surveillance verifies that the AC, DC, and AC vital bus electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence of the electrical divisions is 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, DC, and AC vital bus electrical power distribution subsystems, and other

BASES

SURVEILLANCE REQUIREMENTS (continued)

indications available in the control room that alert the operator to subsystem malfunctions.

REFERENCES

1. FSAR, Chapter [6].
 2. FSAR, Chapter [15].
 3. Regulatory Guide 1.93, December 1974.
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Insert 2