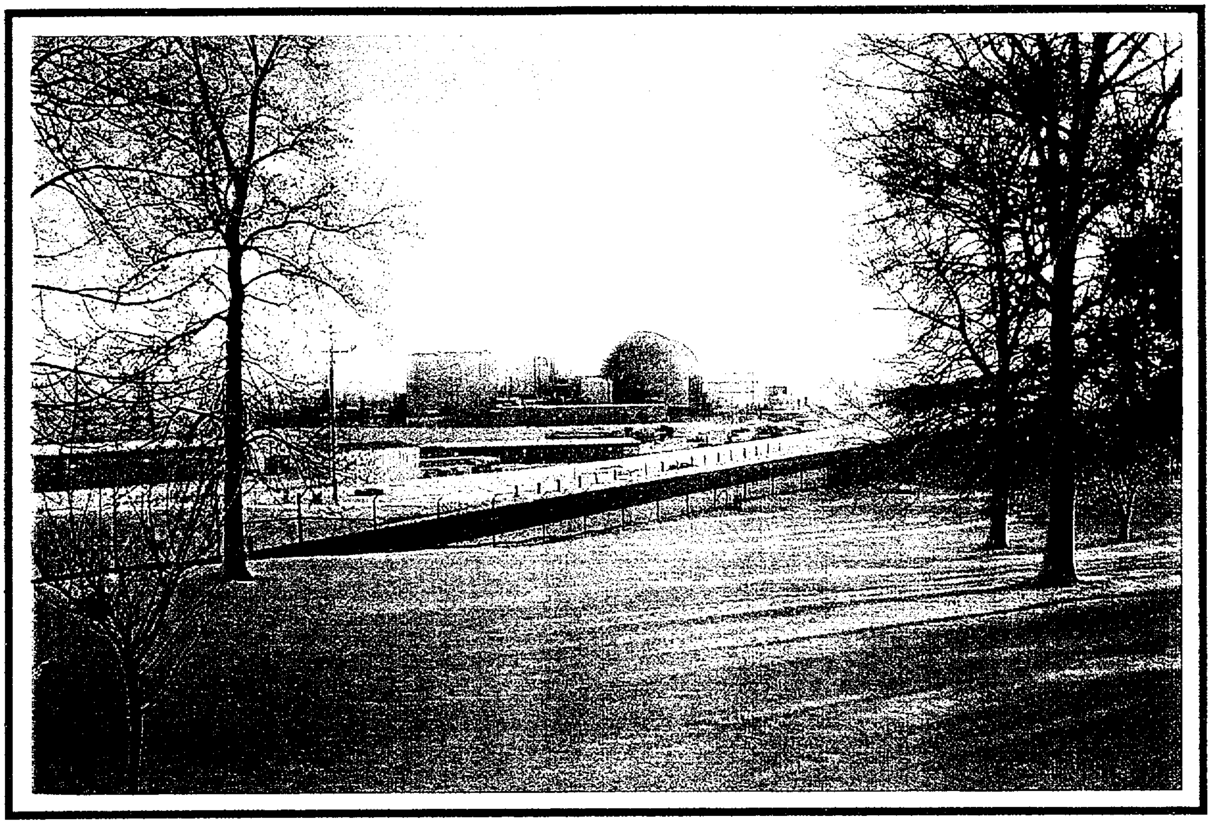
NORTH ANNA POWER STATION

Section 3.7
Plant Systems – Book 1



VOLUME 15
Improved Technical Specifications

Dominion

NORTH ANNA POWER STATION

IMPROVED TECHNICAL SPECIFICATION CONVERSION

SECTION 3.7 - PLANT SYSTEMS

SECTION 3.7 - PLANT SYSTEMS

IMPROVED TECHNICAL SPECIFICATIONS

3.7 PLANT SYSTEMS

3.7.1 Main Steam Safety Valves (MSSVs)

LCO 3.7.1 Five MSSVs per steam generator shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

------------------------------------- NOTE -------------------------------------
Separate Condition entry is allowed for each MSSV.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more steam generators with one MSSV inoperable and the Moderator Temperature Coefficient (MTC) zero or negative at all power levels.	A.1 Reduce THERMAL POWER to less than or equal to 52% RTP.	4 hours
B. One or more steam generators with one MSSV inoperable and the MTC positive at any power levels. <u>OR</u> One or more steam generators with two or more MSSVs inoperable.	B.1 Reduce THERMAL POWER to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs. <u>AND</u>	4 hours (continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2 ---------NOTE--------- Only required in MODE 1. ---------------------- Reduce the Power Range Neutron Flux-High reactor trip setpoint to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs.	 36 hours
C. Required Action and associated Completion Time not met. OR One or more steam generators with greater than or equal to 4 MSSVs inoperable.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	-------------------NOTE-------------------- Only required to be performed in MODES 1 and 2. --- Verify each required MSSV lift setpoint per Table 3.7.1-2 in accordance with the Inservice Testing Program. Following testing, lift setting shall be within ±1%.	 In accordance with the Inservice Testing Program

Table 3.7.1-1 (page 1 of 1)
OPERABLE Main Steam Safety Valves versus
Maximum Allowable Power

NUMBER OF OPERABLE MSSVs PER STEAM GENERATOR	MAXIMUM ALLOWABLE POWER % RTP
4	52
3	37
2	21

Table 3.7.1-2 (page 1 of 1)
Main Steam Safety Valve Lift Settings

STEAM GENERATOR #1	STEAM GENERATOR #2	STEAM GENERATOR #3	LIFT SETTING (psig ± 3%)
	Unit 1 VALVE NUMBER		
MS-SV-101A	MS-SV-101B	MS-SV-101C	1085
MS-SV-102A	MS-SV-102B	MS-SV-102C	1095
MS-SV-103A	MS-SV-103B	MS-SV-103C	1110
MS-SV-104A	MS-SV-104B	MS-SV-104C	1120
MS-SV-105A	MS-SV-105B	MS-SV-105C	1135
	Unit 2 VALVE NUMBER		
MS-SV-201A	MS-SV-201B	MS-SV-201C	1085
MS-SV-202A	MS-SV-202B	MS-SV-202C	1095
MS-SV-203A	MS-SV-203B	MS-SV-203C	1110
MS-SV-204A	MS-SV-204B	MS-SV-204C	1120
MS-SV-205A	MS-SV-205B	MS-SV-205C	1135

3.7 PLANT SYSTEMS

3.7.2 Main Steam Trip Valves (MSTVs)

LCO 3.7.2 Three MSTVs shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3 except when all MSTVs are closed and de-activated.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One MSTV inoperable in MODE 1.	A.1 Restore MSTV to OPERABLE status.	8 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 2.	6 hours
C. ---------NOTE--------- Separate Condition entry is allowed for each MSTV. --------------------- One or more MSTVs inoperable in MODE 2 or 3.	C.1 Close MSTV. AND C.2 Verify MSTV is closed.	8 hours Once per 7 days
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	-------------------NOTE------------------- Only required to be performed in MODES 1 and 2. -- Verify isolation time of each MSTV is ≤ 5 seconds.	In accordance with the Inservice Testing Program
SR 3.7.2.2	-------------------NOTE------------------- Only required to be performed in MODES 1 and 2. -- Verify each MSTV actuates to the isolation position on an actual or simulated actuation signal.	18 months

3.7 PLANT SYSTEMS

3.7.3 Main Feedwater Isolation Valves (MFIVs), Main Feedwater Pump Discharge Valves (MFPDVs), Main Feedwater Regulating Valves (MFRVs), and Main Feedwater Regulating Bypass Valves (MFRBVs)

LCO 3.7.3 Three MFIVs, three MFPDVs, three MFRVs, and three MFRBVs shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3 except when MFIV, MFPDV, MFRV, or MFRBV is closed and de-activated or isolated by a closed manual valve.

ACTIONS

-- NOTE --
Separate Condition entry is allowed for each valve.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more MFIVs inoperable.	A.1 Close or isolate MFIV. <u>AND</u> A.2 Verify by administrative means MFIV is closed or isolated.	72 hours Once per 7 days
B. One or more MFRVs inoperable.	B.1 Close or isolate MFRV. <u>AND</u> B.2 Verify by administrative means MFRV is closed or isolated.	72 hours Once per 7 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more MFRBVs inoperable.	C.1 Close or isolate MFRBV.	72 hours
	<u>AND</u>	
	C.2 Verify by administrative means MFRBV is closed or isolated.	Once per 7 days
D. One or more MFPDV inoperable.	D.1 Close or isolate MFPDV.	72 hours
	<u>AND</u>	
	D.2 Verify by administrative means MFPDV is closed or isolated.	Once per 7 days
E. Two valves in the same flow path inoperable.	E.1 Isolate affected flow path.	8 hours
F. Required Action and associated Completion Time not met.	F.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	F.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Verify the isolation time of each MFIV, MFRV, and MFRBV is $\leq$ 6.98 seconds and the isolation time of each MFPDV is $\leq$ 60 seconds.	In accordance with the Inservice Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.2	Verify each MFIV, MFPDV, MFRV, and MFRBV actuates to the isolation position on an actual or simulated actuation signal.	18 months

Intentionally Blank

3.7 PLANT SYSTEMS

3.7.4 Steam Generator Power Operated Relief Valves (SG PORVs)

LCO 3.7.4 Three SG PORV lines shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required SG PORV line inoperable.	A.1	--------NOTE--------- LCO 3.0.4 is not applicable. --------------------- Restore required SG PORV line to OPERABLE status.	7 days
B. Two or more required SG PORV lines inoperable.	B.1	Restore all but one SG PORV line to OPERABLE status.	24 hours
C. Required Action and associated Completion Time not met.	C.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	C.2	Be in MODE 4 without reliance upon steam generator for heat removal.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify one complete cycle of each SG PORV.	18 months
SR 3.7.4.2	Verify one complete cycle of each SG PORV manual isolation valve.	18 months

3.7 PLANT SYSTEMS

3.7.5 Auxiliary Feedwater (AFW) System

LCO 3.7.5 Three AFW trains shall be OPERABLE.

-------------------- NOTE --------------------
Only one AFW train, which includes a motor driven pump, is required to be OPERABLE in MODE 4.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One steam supply to turbine driven AFW pump inoperable. <u>OR</u> ---------NOTE--------- Only applicable if MODE 2 has not been entered following refueling. ---------------------- One turbine driven AFW pump inoperable in MODE 3 following refueling.	A.1 Restore inoperable equipment to OPERABLE status.	7 days <u>AND</u> 10 days from discovery of failure to meet the LCO
B. One AFW train inoperable in MODE 1, 2 or 3 for reasons other than Condition A.	B.1 Restore AFW train to OPERABLE status.	72 hours <u>AND</u> 10 days from discovery of failure to meet the LCO

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time for Condition A or B not met. OR Two AFW trains inoperable in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours 18 hours
D. Three AFW trains inoperable in MODE 1, 2, or 3.	D.1 ---------NOTE-------- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status. --------------------- Initiate action to restore one AFW train to OPERABLE status.	Immediately
E. Required AFW train inoperable in MODE 4.	E.1 Initiate action to restore AFW train to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.1	Verify each AFW manual, power operated, and automatic valve in each water flow path, and in both steam supply flow paths to the steam turbine driven pump, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.5.2	-------------------NOTE------------------ Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 1005 psig in the steam generator. --- Verify the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.7.5.3	-------------------NOTE-------------------- Not applicable in MODE 4 when steam generator is relied upon for heat removal. --- Verify each AFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	18 months
SR 3.7.5.4	--------------------NOTES------------------ 1. Not required to be performed for the turbine driven AFW pump until 24 hours after ≥ 1005 psig in the steam generator. 2. Not applicable in MODE 4 when steam generator is relied upon for heat removal. --- Verify each AFW pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.7.5.5	Verify proper alignment of the required AFW flow paths by verifying flow from the emergency condensate storage tank to each steam generator.	Prior to entering MODE 3, whenever unit has been in MODE 5, 6, or defueled for a cumulative period > 30 days

Intentionally Blank

3.7 PLANT SYSTEMS

3.7.6 Emergency Condensate Storage Tank (ECST)

LCO 3.7.6 The ECST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. ECST inoperable.	A.1	Verify by administrative means OPERABILITY of Condensate Storage Tank.	4 hours <u>AND</u> Once per 12 hours thereafter
	<u>AND</u>		
	A.2	Restore ECST to OPERABLE status.	7 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	B.2	Be in MODE 4, without reliance on steam generator for heat removal.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the ECST contains $\geq$ 110,000 gal.	12 hours

Intentionally Blank

3.7 PLANT SYSTEMS

3.7.7 Secondary Specific Activity

LCO 3.7.7 The specific activity of the secondary coolant shall be $\leq$ 0.10 μCi/gm DOSE EQUIVALENT I-131.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Specific activity not within limit.	A.1 Be in MODE 3. AND A.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.7.1 Verify the specific activity of the secondary coolant is $\leq$ 0.10 μCi/gm DOSE EQUIVALENT I-131.	31 days

Intentionally Blank

3.7 PLANT SYSTEMS

3.7.8 Service Water (SW) System

LCO 3.7.8 Two SW System loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SW pump inoperable.	A.1 Throttle SW System flow to Component Cooling (CC) heat exchangers.	72 hours
B. Two SW pumps inoperable.	B.1 Throttle SW System flow to CC heat exchangers.	1 hour
	AND	
	B.2 Restore one SW pump to OPERABLE status.	72 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One SW System loop inoperable for reasons other than Condition A.	C.1 Restore SW System loop to OPERABLE status.	-----NOTE------ 72 hour Completion Time only required if criteria allowing 7 day Completion Time are not met. --------------- 72 hours <u>AND</u> -----NOTE------ Only applicable if: 1. SW loop inoperability is part of SW System upgrades, and 2. Three SW pumps are OPERABLE from initial Condition entry (one SW pump allowed to not have automatic start capability), and 3. Two auxiliary SW pumps are OPERABLE from initial Condition entry. --------------- 7 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Actions and associated Completion Times of Conditions A, B or C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours
E. Two SW System loops inoperable for reasons other than only two SW pumps being OPERABLE.	E.1 Be in MODE 4. AND E.2 Initiate actions to be in MODE 5.	12 hours 13 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	-------------------NOTE-------------------- Isolation of SW flow to individual components does not render the SW System inoperable. --- Verify each SW System manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.8.2	Verify each SW System automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	18 months
SR 3.7.8.3	Verify each SW pump starts automatically on an actual or simulated actuation signal.	18 months

Intentionally Blank

3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9 The UHS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. UHS inoperable.	A.1 Be in MODE 3.	6 hours
	AND	
	A.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify water level of the Service Water Reservoir is ≥ 313 ft mean sea level.	24 hours
SR 3.7.9.2	Verify average water temperature of the Service Water Reservoir is ≤ 95°F.	24 hours

Intentionally Blank

3.7 PLANT SYSTEMS

3.7.10 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS)—MODES 1, 2, 3, and 4

LCO 3.7.10 The following MCR/ESGR EVS trains shall be OPERABLE:

a. Two MCR/ESGR Emergency Ventilation System (EVS) trains; and

b. One MCR/ESGR EVS train on the other unit.

-------------------------------- NOTE --------------------------------
The MCR/ESGR boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required LCO 3.7.10.a or LCO 3.7.10.b MCR/ESGR EVS train inoperable.	A.1 Restore train to OPERABLE status.	7 days
B. Two or more required LCO 3.7.10.a or LCO 3.7.10.b MCR/ESGR EVS trains inoperable due to inoperable MCR/ESGR boundary.	B.1 Restore MCR/ESGR boundary to OPERABLE status.	24 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two or more required LCO 3.7.10.a or LCO 3.7.10.b MCR/ESGR EVS trains inoperable for reasons other than Condition B.	D.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.10.1	Operate each required MCR/ESGR EVS train for ≥ 10 continuous hours with the heaters operating.	31 days
SR 3.7.10.2	Perform required MCR/ESGR EVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with VFTP
SR 3.7.10.3	Verify each LCO 3.7.10.a MCR/ESGR EVS train actuates on an actual or simulated actuation signal.	18 months
SR 3.7.10.4	Verify each required MCR/ESGR EVS train can maintain a positive pressure of ≥ 0.04 inches water gauge, relative to the adjacent areas, during the pressurization mode of operation at a makeup flow rate of ≥ 900 cfm and ≤ 1100 cfm.	18 months on a STAGGERED TEST BASIS

3.7 PLANT SYSTEMS

3.7.11 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Air Conditioning System (ACS)

LCO 3.7.11 Two MCR/ESGR ACS subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
During movement of recently irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required MCR/ESGR ACS subsystem inoperable.	A.1 Restore MCR/ESGR ACS subsystem to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 36 hours
C. Required Action and associated Completion Time of Condition A not met during movement of recently irradiated fuel assemblies.	C.1 Place OPERABLE MCR/ESGR ACS subsystem in operation. <u>OR</u> C.2 Suspend movement of recently irradiated fuel assemblies.	Immediately Immediately
D. Less than 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem available during movement of recently irradiated fuel assemblies.	D.1 Suspend movement of recently irradiated fuel assemblies.	Immediately

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Less than 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem available in MODE 1, 2, 3, or 4.	E.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify each required MCR/ESGR ACS chiller has the capability to remove the assumed heat load.	18 months on a STAGGERED TEST BASIS

3.7 PLANT SYSTEMS

3.7.12 Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS)

LCO 3.7.12 Two ECCS PREACS trains shall be OPERABLE.

------------------------------ NOTE ------------------------------
The ECCS pump room boundary openings not open by design may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ECCS PREACS train inoperable.	A.1 Restore ECCS PREACS train to OPERABLE status.	7 days
B. Two ECCS PREACS trains inoperable due to inoperable ECCS pump room boundary.	B.1 Restore ECCS pump room boundary to OPERABLE status.	24 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	C.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	Operate each ECCS PREACS train for ≥ 10 continuous hours with the heaters operating.	31 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.2	Actuate each ECCS PREACS train by aligning Safeguards Area exhaust flow and Auxiliary Building Central exhaust flow through the Auxiliary Building HEPA filter and charcoal adsorber assembly.	31 days
SR 3.7.12.3	Perform required ECCS PREACS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.12.4	Verify Safeguards Area exhaust flow is diverted and each Auxiliary Building filter bank is actuated on an actual or simulated actuation signal.	18 months
SR 3.7.12.5	Verify one ECCS PREACS train can maintain a negative pressure relative to adjacent areas during post accident mode of operation.	18 months on a STAGGERED TEST BASIS

3.7 PLANT SYSTEMS

3.7.13 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Bottled Air System

LCO 3.7.13 Three MCR/ESGR bottled air system trains shall be OPERABLE.

-------------- NOTE --------------
The MCR/ESGR boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, and 4,
During movement of recently irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required MCR/ESGR bottled air system train inoperable.	A.1 Restore train to OPERABLE status.	7 days
B. Two or more required MCR/ESGR bottled air system trains inoperable due to inoperable MCR/ESGR boundary in MODE 1, 2, 3, or 4.	B.1 Restore MCR/ESGR boundary to OPERABLE status.	24 hours
C. Two or more required MCR/ESGR bottled air system trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	C.1 Restore at least two MCR/ESGR bottled air system train to OPERABLE status.	24 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A, B or C not met in MODE 1, 2, 3, or 4.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours
E. Required Action and associated Completion Time of Condition A not met during movement of recently irradiated fuel assemblies. OR Two or more required MCR/ESGR bottled air system trains inoperable during movement of recently irradiated fuel assemblies.	E.1 Suspend movement of recently irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.1	Verify each required MCR/ESGR bottled air bank is pressurized to $\geq$ 2300 psig.	31 days
SR 3.7.13.2	Verify each required MCR/ESGR bottled air bank manual valve not locked, sealed, or otherwise secured and required to be open during accident conditions is open.	31 days
SR 3.7.13.3	Verify each required MCR/ESGR bottled air system train actuates on an actual or simulated actuation signal.	18 months

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.13.4	Verify two required MCR/ESGR bottled air system trains can maintain a positive pressure of ≥ 0.05 inches water gauge, relative to the adjacent areas at a makeup flow rate of ≥ 340 cfm for at least 60 minutes.	18 months on a STAGGERED TEST BASIS

Intentionally Blank

3.7 PLANT SYSTEMS

3.7.14 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS)—During Movement of Recently Irradiated Fuel Assemblies

LCO 3.7.14 Two MCR/ESGR EVS trains shall be OPERABLE.

------------------------------ NOTE ------------------------------
The MCR/ESGR boundary may be opened intermittently under administrative control.

APPLICABILITY: During movement of recently irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required MCR/ESGR EVS train inoperable.	A.1 Restore train to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> Two required MCR/ESGR EVS trains inoperable.	B.1 Suspend movement of recently irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.14.1	Operate each required MCR/ESGR EVS train for $\geq$ 10 continuous hours with the heaters operating.	31 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.14.2	Perform required MCR/ESGR EVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with VFTP
SR 3.7.14.3	Verify each required MCR/ESGR EVS train can maintain a positive pressure of ≥ 0.04 inches water gauge, relative to the adjacent areas, during the pressurization mode of operation at a makeup flow rate of ≥ 900 cfm and ≤ 1100 cfm.	18 months on a STAGGERED TEST BASIS

3.7 PLANT SYSTEMS

3.7.15 Fuel Building Ventilation System (FBVS)

LCO 3.7.15 The FBVS shall be OPERABLE and in operation.

APPLICABILITY: During movement of recently irradiated fuel assemblies in the fuel building.

ACTIONS

-- NOTE --
The fuel building boundary may be opened intermittently under administrative control.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. FBVS inoperable. <u>OR</u> FBVS not in operation.	A.1 Suspend movement of recently irradiated fuel assemblies in the fuel building.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.15.1 Verify the FBVS can maintain a pressure ≤ -0.125 inches water gauge with respect to atmospheric pressure.	18 months

Intentionally Blank

3.7 PLANT SYSTEMS

3.7.16 Fuel Storage Pool Water Level

LCO 3.7.16 The fuel storage pool water level shall be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: During movement of irradiated fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage pool water level not within limit.	A.1 --------NOTE--------- LCO 3.0.3 is not applicable. --------------------- Suspend movement of irradiated fuel assemblies in the fuel storage pool.	 Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool water level is ≥ 23 ft above the top of the irradiated fuel assemblies seated in the storage racks.	7 days

Intentionally Blank

SECTION 3.7 - PLANT SYSTEMS

IMPROVED TECHNICAL SPECIFICATIONS BASES

B 3.7 PLANT SYSTEMS

B 3.7.1 Main Steam Safety Valves (MSSVs)

BASES

BACKGROUND

The primary purpose of the MSSVs is to provide overpressure protection for the secondary system. The MSSVs also provide protection against overpressurizing the reactor coolant pressure boundary (RCPB) by providing a heat sink for the removal of energy from the Reactor Coolant System (RCS) if the preferred heat sink, provided by the Condenser and Circulating Water System, is not available.

Five MSSVs are located on each main steam header, outside containment, upstream of the main steam isolation valves, as described in the UFSAR, Section 10.3.1 (Ref. 1). The MSSVs must have sufficient capacity to limit the secondary system pressure to ≤ 110% of the steam generator design pressure in order to meet the requirements of the ASME Code, Section III (Ref. 2). The MSSV design includes staggered setpoints, according to Table 3.7.1-2 in the accompanying LCO, so that only the needed valves will actuate. Staggered setpoints reduce the potential for valve chattering that is due to steam pressure insufficient to fully open all valves following a turbine reactor trip.

APPLICABLE SAFETY ANALYSES

The design basis for the capacity of the MSSVs comes from Reference 2 and its purpose is to limit the secondary system pressure to ≤ 110% of design pressure for any anticipated operational occurrence (AOO) or accident considered in the Design Basis Accident (DBA) and transient analysis.

The events that challenge the relieving capacity of the MSSVs, and thus RCS pressure, are those characterized as decreased heat removal events, which are presented in the UFSAR, Section 15.2 (Ref. 3). Of these, the full power turbine trip without steam dump is typically the limiting AOO. This event also terminates normal feedwater flow to the steam generators.

The safety analysis demonstrates that the transient response for turbine trip occurring from full power without a direct reactor trip presents no hazard to the integrity of the RCS or the Main Steam System. One turbine trip analysis is performed assuming primary system pressure control via

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

operation of the pressurizer relief valves and spray. This analysis demonstrates that the DNB design basis is met. Another analysis is performed assuming no primary system pressure control, but crediting reactor trip on high pressurizer pressure and operation of the pressurizer safety valves. This analysis demonstrates that RCS integrity is maintained by showing that the maximum RCS pressure does not exceed 110% of the design pressure. All cases analyzed demonstrate that the MSSVs maintain Main Steam System integrity by limiting the maximum steam pressure to less than 110% of the steam generator design pressure.

In addition to the decreased heat removal events, reactivity insertion events may also challenge the relieving capacity of the MSSVs. The uncontrolled rod cluster control assembly (RCCA) bank withdrawal at power event is characterized by an increase in core power and steam generation rate until reactor trip occurs when either the Overtemperature ΔT or Power Range Neutron Flux-High setpoint is reached. Steam flow to the turbine will not increase from its initial value for this event. The increased heat transfer to the secondary side causes an increase in steam pressure and may result in opening of the MSSVs prior to reactor trip, assuming no credit for operation of the atmospheric or condenser steam dump valves. The UFSAR Section 15.2 safety analysis of the RCCA bank withdrawal at power event for a range of initial core power levels demonstrates that the MSSVs are capable of preventing secondary side overpressurization for this AOO. The UFSAR safety analyses discussed above assume that all of the MSSVs for each steam generator are OPERABLE. If there are inoperable MSSV(s), it is necessary to limit the primary system power during steady-state operation and AOOs to a value that does not result in exceeding the combined steam flow capacity of the turbine (if available) and the remaining OPERABLE MSSVs. The required limitation on primary system power necessary to prevent secondary system overpressurization may be determined by system transient analyses or conservatively arrived at by a simple heat balance calculation. In some circumstances it is necessary to limit the primary side heat generation that can be achieved during an AOO by reducing the setpoint of the Power Range Neutron Flux-High reactor trip function. For example, if more than one MSSV on a single steam generator is inoperable, an uncontrolled RCCA bank withdrawal at power event occurring from a partial power level may result in an increase in reactor power that exceeds the combined steam flow capacity of the turbine and the remaining OPERABLE

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)	MSSVs. Thus, for multiple inoperable MSSVs on the same steam generator it is necessary to prevent this power increase by lowering the Power Range Neutron Flux-High setpoint to an appropriate value. When Moderator Temperature Coefficient (MTC) is positive, the reactor power may increase above the initial value during an RCS heatup event (e.g., turbine trip). Thus, for any number of inoperable MSSVs it is necessary to reduce the trip setpoint if a positive MTC may exist at partial power conditions. The MSSVs satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	The accident analysis requires five MSSVs per steam generator be OPERABLE to provide overpressure protection for design basis transients occurring at 102% RTP. The LCO requires that five MSSVs per steam generator be OPERABLE in compliance with Reference 2, and the DBA analysis. The OPERABILITY of the MSSVs is defined as the ability to open upon demand within the setpoint tolerances to relieve steam generator overpressure, and reseat when pressure has been reduced. The OPERABILITY of the MSSVs is determined by periodic surveillance testing in accordance with the Inservice Testing Program. This LCO provides assurance that the MSSVs will perform their designed safety functions to mitigate the consequences of accidents that could result in a challenge to the RCPB or Main Steam System integrity.
APPLICABILITY	In MODES 1, 2, and 3, five MSSVs per steam generator are required to be OPERABLE to prevent Main Steam System overpressurization. In MODES 4 and 5, there are no credible transients requiring the MSSVs. The steam generators are not normally used for heat removal in MODES 5 and 6, and thus cannot be overpressurized; there is no requirement for the MSSVs to be OPERABLE in these MODES.
ACTIONS	The ACTIONS table is modified by a Note indicating that separate Condition entry is allowed for each MSSV.

(continued)

BASES

ACTIONS (continued)

With one or more MSSVs inoperable, action must be taken so that the available MSSV relieving capacity meets Reference 2 requirements.

Operation with less than all five MSSVs OPERABLE for each steam generator is permissible, if THERMAL POWER is limited to the relief capacity of the remaining MSSVs. This is accomplished by restricting THERMAL POWER so that the energy transfer to the most limiting steam generator is not greater than the available relief capacity in that steam generator.

A.1

In the case of only a single inoperable MSSV on one or more steam generators, when the MTC is not positive, a reactor power reduction alone is sufficient to limit primary side heat generation such that overpressurization of the secondary side is precluded for any RCS heatup event. Furthermore, for this case there is sufficient total steam flow capacity provided by the turbine and remaining OPERABLE MSSVs to preclude overpressurization in the event of an increased reactor power due to reactivity insertion, such as in the event of an uncontrolled RCCA bank withdrawal at power. Therefore, Required Action A.1 requires an appropriate reduction in reactor power within 4 hours.

The maximum THERMAL POWER corresponding to the heat removal capacity of the remaining OPERABLE MSSVs is determined via a conservative heat balance calculation as described in the attachment to Reference 6, with an appropriate allowance for calorimetric power uncertainty.

B.1 and B.2

In the case of multiple inoperable MSSVs on one or more steam generators, with a reactor power reduction alone there may be insufficient total steam flow capacity provided by the turbine and remaining OPERABLE MSSVs to preclude overpressurization in the event of an increased reactor power due to reactivity insertion, such as in the event of an uncontrolled RCCA bank withdrawal at power. Furthermore, for a single inoperable MSSV on one or more steam generators when the MTC is positive the reactor power may increase as a result of an RCS heatup event such that flow capacity of the remaining OPERABLE MSSVs is insufficient. The 4 hour Completion Time for Required Action B.1 is consistent with A.1. An additional 32 hours is allowed in Required

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

Action B.2 to reduce the setpoints. The Completion Time of 36 hours is based on a reasonable time to correct the MSSV inoperability, the time required to perform the power reduction, operating experience in resetting all channels of a protective function, and on the low probability of the occurrence of a transient that could result in steam generator overpressure during this period.

The maximum THERMAL POWER corresponding to the heat removal capacity of the remaining OPERABLE MSSVs is determined via a conservative heat balance calculation as described in the attachment to Reference 6, with an appropriate allowance for Nuclear Instrumentation System trip channel uncertainties.

Required Action B.2 is modified by a Note, indicating that the Power Range Neutron Flux-High reactor trip setpoint reduction is only required in MODE 1. In MODES 2 and 3 the reactor protection system trips specified in LCO 3.3.1, "Reactor Protection System Instrumentation," provide sufficient protection.

The allowed Completion Times are reasonable based on operating experience to accomplish the Required Actions in an orderly manner without challenging unit systems.

C.1 and C.2

If the Required Actions are not completed within the associated Completion Time, or if one or more steam generators have ≥ 4 inoperable MSSVs, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within 12 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 verifies the OPERABILITY of the MSSVs by the verification of each MSSV lift setpoint in accordance with the Inservice Testing Program. The ASME Code, Section XI

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1 (continued)

(Ref. 4), requires that safety and relief valve tests be performed in accordance with ANSI/ASME OM-1-1987 (Ref. 5). According to Reference 5, the following tests are required:

a. Visual examination;

b. Seat tightness determination;

c. Setpoint pressure determination (lift setting);

d. Compliance with owner's seat tightness criteria; and

e. Verification of the balancing device integrity on balanced valves.

The ANSI/ASME Standard requires that all valves be tested every 5 years, and a minimum of 20% of the valves be tested every 24 months. The ASME Code specifies the activities and frequencies necessary to satisfy the requirements. Table 3.7.1-2 allows a ±3% setpoint tolerance for OPERABILITY; however, the valves are reset to ±1% during the Surveillance to allow for drift. The lift settings, according to Table 3.7.1-2, correspond to ambient conditions of the valve at nominal operating temperature and pressure.

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. The MSSVs may be either bench tested or tested in situ at hot conditions using an assist device to simulate lift pressure. If the MSSVs are not tested at hot conditions, the lift setting pressure shall be corrected to ambient conditions of the valve at operating temperature and pressure.

REFERENCES

1. UFSAR, Section 10.3.1.

2. ASME, Boiler and Pressure Vessel Code, Section III, 1968 Edition with Addenda through Winter 1970.

3. UFSAR, Section 15.2.

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

5. ANSI/ASME OM-1-1987.

BASES

REFERENCES

6. NRC Information Notice 94-60, "Potential Overpressurization of the Main Steam System," August 22, 1994.

Intentionally Blank

B 3.7 PLANT SYSTEMS

B 3.7.2 Main Steam Trip Valves (MSTVs)

BASES

BACKGROUND

The MSTVs isolate steam flow from the secondary side of the steam generators following a high energy line break (HELB). MSTV closure terminates flow from the unaffected (intact) steam generators.

One MSTV is located in each main steam line outside, but close to, containment. The MSTVs are downstream from the main steam safety valves (MSSVs) and auxiliary feedwater (AFW) pump turbine steam supply, to prevent MSSV and AFW isolation from the steam generators by MSTV closure. Closing the MSTVs isolates each steam generator from the others, and isolates the turbine, Steam Dump System, and other auxiliary steam supplies from the steam generators.

The MSTVs close on a main steam isolation signal generated by either intermediate high high containment pressure, high steam flow coincident with low low RCS T_{avg}, or low steam line pressure. The MSTVs fail closed on loss of control air pressure.

Each MSTV has an MSTV bypass valve. Although these bypass valves are normally closed, they receive the same emergency closure signal as do their associated MSTVs. The MSTV bypass valves may also be actuated manually.

A description of the MSTVs is found in the UFSAR, Section 10.3 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The design basis of the MSTVs is established by the containment analysis for the main steam line break (MSLB) inside containment, discussed in the UFSAR, Section 6.2 (Ref. 2). It is also affected by the accident analysis of the SLB events presented in the UFSAR, Section 15.4.2 (Ref. 3). The design precludes the blowdown of more than one steam generator, assuming a single active component failure (e.g., the failure of one MSTV to close on demand).

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The limiting case for the containment analysis is the MSLB inside containment, with a loss of offsite power following turbine trip, and failure of the Non Return Valve (NRV) on the affected steam generator to close. At lower powers, the steam generator inventory and temperature are at their maximum, maximizing the analyzed mass and energy release to the containment. Due to reverse flow and failure of the NRV to close, the additional mass and energy in the steam headers downstream from the other MSTVs contribute to the total release. With the most reactive rod cluster control assembly assumed stuck in the fully withdrawn position, there is an increased possibility that the core will become critical and return to power. The core is ultimately shut down by the boric acid injection delivered by the Emergency Core Cooling System.

The accident analysis compares several different MSLB events against different acceptance criteria. The MSLB outside containment upstream of the MSTV is limiting for offsite dose, although a break in this short section of main steam header has a very low probability. The MSLB inside containment at hot zero power is the limiting case for a post trip return to power. The analysis includes scenarios with offsite power available, and with a loss of offsite power following turbine trip. With offsite power available, the reactor coolant pumps continue to circulate coolant through the steam generators, maximizing the Reactor Coolant System cooldown. With a loss of offsite power, the response of mitigating systems is delayed. Significant single failures considered include failure of an MSTV to close.

The MSTVs only serve a safety function and remain open during power operation. These valves operate under the following situations:

a. A HELB inside containment. In order to maximize the mass and energy release into containment, the analysis assumes that the NRV in the affected steam generator remains open. For this accident scenario, steam is discharged into containment from all steam generators until the remaining MSTVs close. After MSTV closure, steam is discharged into containment only from the affected steam generator and from the residual steam in the main steam header downstream of the closed MSTVs in the unaffected loops. Closure of the MSTVs isolates the break from the unaffected steam generators.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

b. A break outside of containment and upstream from the MSTV is not a containment pressurization concern. The uncontrolled blowdown of more than one steam generator must be prevented to limit the potential for uncontrolled RCS cooldown and positive reactivity addition. Closure of the MSTVs isolates the break and limits the blowdown to a single steam generator.

c. A break downstream of the MSTVs will be isolated by the closure of the MSTVs.

d. Following a steam generator tube rupture, closure of the MSTVs isolates the ruptured steam generator from the intact steam generators to minimize radiological releases.

e. The MSTVs are also utilized during other events such as a feedwater line break. This event is less limiting so far as MSTV OPERABILITY is concerned.

The MSTVs satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO requires that three MSTVs in the steam lines be OPERABLE. The MSTVs are considered OPERABLE when the isolation times are within limits, and they close on an isolation actuation signal.

This LCO provides assurance that the MSTVs will perform their design safety function to mitigate the consequences of accidents that could result in offsite exposures comparable to the 10 CFR 100 (Ref. 4) limits or the NRC staff approved licensing basis.

APPLICABILITY

The MSTVs must be OPERABLE in MODE 1, and in MODES 2 and 3 except when closed and de-activated, when there is significant mass and energy in the RCS and steam generators. When the MSTVs are closed, they are already performing the safety function.

In MODE 4, the steam generator energy is low and the MSTVs are not required to support the safety analyses due to the low probability of a design basis accident.

(continued)

BASES

APPLICABILITY (continued)

In MODE 5 or 6, the steam generators do not contain much energy because their temperature is below the boiling point of water; therefore, the MSTVs are not required for isolation of potential high energy secondary system pipe breaks in these MODES.

ACTIONS

A.1

With one MSTV inoperable in MODE 1, action must be taken to restore OPERABLE status within 8 hours. Some repairs to the MSTV can be made with the unit hot. The 8 hour Completion Time is reasonable, considering the low probability of an accident occurring during this time period that would require a closure of the MSTVs.

The 8 hour Completion Time is greater than that normally allowed for containment isolation valves because the MSTVs are valves that isolate a closed system penetrating containment. These valves differ from other containment isolation valves in that the closed system provides an additional means for containment isolation.

B.1

If the MSTV cannot be restored to OPERABLE status within 8 hours, 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 MODE 2 within 6 hours and Condition C would be entered. The Completion Times are reasonable, based on operating experience, to reach MODE 2 and to close the MSTVs in an orderly manner and without challenging unit systems.

C.1 and C.2

Condition C is modified by a Note indicating that separate Condition entry is allowed for each MSTV.

Since the MSTVs are required to be OPERABLE in MODES 2 and 3, the inoperable MSTVs may either be restored to OPERABLE status or closed. When closed, the MSTVs are already in the position required by the assumptions in the safety analysis.

The 8 hour Completion Time is consistent with that allowed in Condition A.

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

For inoperable MSTVs that cannot be restored to OPERABLE status within the specified Completion Time, but are closed, the inoperable MSTVs must be verified on a periodic basis to be closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of MSTV status indications available in the control room, and other administrative controls, to ensure that these valves are in the closed position.

D.1 and D.2

If the MSTVs cannot be restored to OPERABLE status or are not closed within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed at least in MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from MODE 2 conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1

This SR verifies that MSTV isolation time is ≤ 5.0 seconds. The MSTV isolation time is assumed in the accident and containment analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. The MSTVs should not be tested at power, since even a part stroke exercise increases the risk of a valve closure when the unit is generating power. As the MSTVs are not tested at power, they are exempt from the ASME Code, Section XI (Ref. 5), requirements during operation in MODE 1 or 2.

The Frequency is in accordance with the Inservice Testing Program.

This test may be conducted in MODE 3 with the unit at operating temperature and pressure. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.2.2

This SR verifies that each MSTV closes on an actual or simulated actuation signal. This Surveillance is normally performed upon returning the plant to operation following a refueling outage. The Frequency of MSTV testing is every 18 months. The 18 month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.

REFERENCES

1. UFSAR, Section 10.3.

2. UFSAR, Section 6.2.

3. UFSAR, Section 15.4.2.

4. 10 CFR 100.11.

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

B 3.7 PLANT SYSTEMS

B 3.7.3 Main Feedwater Isolation Valves (MFIVs), Main Feedwater Pump Discharge Valves (MFPDVs), Main Feedwater Regulating Valves (MFRVs), and Main Feedwater Regulating Bypass Valves (MFRBVs)

BASES

BACKGROUND

The MFIV and the MFRV are in series in the Main Feedwater (MFW) line upstream of each steam generator. The MFRBV is parallel to both the MFIV and the MFRV. The MFPDV is located at the discharge of each main feedwater pump. The valves are located outside of the containment. These valves provide the isolation of each MFW line by the closure of the MFIV and MFRBV, the MFRV and MFRBV, or the closure of the MFPDV. To provide the needed isolation given the single failure of one of the valves, all four valve types are required to be OPERABLE.

The safety-related function of the MFIVs, MFPDVs, MFRVs and the MFRBVs is to provide isolation of MFW from the secondary side of the steam generators following a high energy line break. Closure of the MFIV and MFRBV, the MFRV and MFRBV, or the closure of the MFPDV terminates the addition of feedwater to an affected steam generator, limiting the mass and energy release for steam or feedwater line breaks and minimizing the positive reactivity effects of the Reactor Coolant System (RCS) cooldown associated with the blowdown. In the event of pipe rupture inside the containment, the valves limit the quantity of high energy fluid that enters the containment through the broken loop.

The containment isolation MFW check valve in each loop provides the first pressure boundary for the addition of Auxiliary Feedwater (AFW) to the intact loops and prevents back flow in the feedwater line should a break occur upstream of these valves. These check valves also isolate the non-safety-related portion of the MFW system from the safety-related portion of the system. The piping volume from the feedwater isolation valve to the steam generators is considered in calculating mass and energy release following either a steam or feedwater line break.

The MFIVs, MFPDVs, MFRVs, and MFRBVs close on receipt of Safety Injection or Steam Generator Water Level—High High signal. The MFIVs, MFPDVs, MFRVs, and MFRBVs may also be actuated manually.

(continued)

BASES

BACKGROUND (continued)	A description of the operation of the MFIVs, MFPDVs, MFRVs, and MFRBVs is found in the UFSAR, Section 10.4.3 (Ref. 1).
APPLICABLE SAFETY ANALYSES	The design basis for the closure of the MFIVs, MFPDVs, MFRVs, and MFRBVs is established by the analyses for the Main Steam Line Break (MSLB). It is also influenced by the accident analysis for the Feedwater Line Break (FWLB). Closure of the MFIVs and MFRBVs, or MFRVs and MFRBVs, or the MFPDVs, may also be relied on to terminate an MSLB on receipt of an SI signal for core response analysis and for an excess feedwater event upon the receipt of a Steam Generator Water Level—High High signal. Failure of an MFIV and MFRV, or an MFRBV and MFPDV to close following an MSLB or FWLB can result in additional mass and energy being delivered to the steam generators, contributing to cooldown. This failure also results in additional mass and energy releases following an MSLB or FWLB event. The MFIVs, MFPDVs, MFRVs, and MFRBVs satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	This LCO ensures that the MFIVs, MFPDVs, MFRVs, and MFRBVs will isolate MFW flow to the steam generators, following an FWLB or MSLB. This LCO requires that three MFIVs, three MFPDVs, three MFRVs, and three MFRBVs be OPERABLE. The valves are considered OPERABLE when isolation times are within limits and they close on an isolation actuation signal. Failure to meet the LCO requirements can result in additional mass and energy being released to containment following an MSLB or FWLB inside containment. A feedwater isolation signal on high high steam generator level is relied on to terminate an excess feedwater flow event, and failure to meet the LCO may result in the introduction of water into the main steam lines.
APPLICABILITY	The MFIVs, MFPDVs, MFRVs, and MFRBVs must be OPERABLE whenever there is significant mass and energy in the RCS and steam generators. In MODES 1, 2, and 3, the MFIVs, MFPDVs, MFRVs, and MFRBVs are required to be OPERABLE to limit the amount of available fluid that could be added to containment

(continued)

BASES

APPLICABILITY (continued)

in the case of a secondary system pipe break inside containment. When the valves are closed and de-activated or isolated by a closed manual valve, they are already performing their safety function.

In MODES 4, 5, and 6, steam generator energy is low. Therefore, the MFIVs, MFPDVs, MFRVs, and MFRBVs are not required to be OPERABLE.

ACTIONS

The ACTIONS table is modified by a Note indicating that separate Condition entry is allowed for each valve.

A.1 and A.2

With one MFIV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable affected valves within 72 hours. When these valves are closed or isolated, they are performing their required safety function.

The 72 hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The 72 hour Completion Time is reasonable, based on operating experience.

Inoperable MFIVs that are closed or isolated must be verified, by direct or administrative means, on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of other administrative controls, to ensure that these valves are closed or isolated.

B.1 and B.2

With one MFRV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable affected valves within 72 hours. When these valves are closed or isolated, they are performing their required safety function.

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

The 72 hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The 72 hour Completion Time is reasonable, based on operating experience.

Inoperable MFRVs, that are closed or isolated, must be verified, by direct or administrative means, on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of other administrative controls to ensure that the valves are closed or isolated.

C.1 and C.2

With one MFRBV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable affected valves within 72 hours. When these valves are closed or isolated, they are performing their required safety function.

The 72 hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The 72 hour Completion Time is reasonable, based on operating experience.

Inoperable MFRBVs that are closed or isolated must be verified, by direct or administrative means, on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of other administrative controls to ensure that these valves are closed or isolated.

D.1 and D.2

With one MFPDV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable affected valves within 72 hours. When these valves are closed or isolated, they are performing their required safety function.

(continued)

BASES

ACTIONS

D.1 and D.2 (continued)

The 72 hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The 72 hour Completion Time is reasonable, based on operating experience.

Inoperable MFPDVs that are closed or isolated must be verified, by direct or administrative means, on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, and in view of other administrative controls, to ensure that these valves are closed or isolated.

E.1

With two inoperable valves in the same flow path, there may be no redundant system to operate automatically and perform the required safety function. Under these conditions, the affected valves must be restored to OPERABLE status, or the affected flow path isolated within 8 hours. This action returns the system to the condition where at least one valve in each flow path is performing the required safety function. The 8 hour Completion Time is reasonable, based on operating experience, to complete the actions required to close the affected valves, or otherwise isolate the affected flow path.

F.1 and F.2

If the inoperable valve(s) cannot be restored to OPERABLE status, or closed, or isolated within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1

This SR verifies that the isolation time of each MFIV, MFRV, and MFRBV is ≤ 6.98 seconds and the isolation time for each MFPDV is ≤ 60 seconds. The isolation times are assumed in the accident and containment analyses. This Surveillance is normally performed during a refueling outage.

The Frequency for this SR is in accordance with the Inservice Testing Program.

SR 3.7.3.2

This SR verifies that each MFIV, MFRV, MFRBV, and MFPDV can close on an actual or simulated actuation signal. This Surveillance is normally performed upon returning the plant to operation following a refueling outage.

The Frequency for this SR is every 18 months. The 18 month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.

REFERENCES

1. UFSAR, Section 10.4.7.

B 3.7 PLANT SYSTEMS

B 3.7.4 Steam Generator Power Operated Relief Valves (SG PORVs)

BASES

BACKGROUND

The SG PORVs provide a method for cooling the unit to residual heat removal (RHR) entry conditions should the preferred heat sink via the condenser dump valves not be available, as discussed in the UFSAR, Section 10.3 (Ref. 1). This is done in conjunction with the Auxiliary Feedwater System providing cooling water from the emergency condensate storage tank (ECST) (or, alternately, with main feedwater from the condenser hotwell or main condensate tanks, if available).

One SG PORV line for each of the three steam generators is provided. Each SG PORV line consists of one SG PORV and an associated upstream manual isolation valve.

The SG PORVs are provided with upstream manual isolation valves to permit their being tested at power, and to provide an alternate means of isolation. The SG PORVs are equipped with pneumatic controllers to permit control of the cooldown rate.

The SG PORVs are provided with a backup supply tank which is pressurized from the instrument air header via a check valve arrangement that, on a loss of pressure in the normal instrument air supply, automatically supplies air to operate the SG PORVs. The air supply is sized to provide the sufficient pressurized air to operate the SG PORVs until manual operation of the SG PORVs can be established.

A description of the SG PORVs is found in Reference 1. The SG PORVs are OPERABLE when they are capable of providing controlled relief of the main steam flow and capable of being fully opened and closed, either remotely or by local manual operation.

APPLICABLE SAFETY ANALYSES

The design basis of the SG PORVs is established by the capability to cool the unit to RHR entry conditions. The SG PORVs are used in conjunction with auxiliary feedwater supplied from the ECST (or, alternately, with main feedwater from the condenser hotwell or main condensate tanks, if

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

available). Adequate inventory is available in the ECST to support operation for 2 hours in MODE 3 followed by a 4 hour cooldown to the RHR entry conditions.

In the SGTR accident analysis presented in Reference 2, the SG PORVs are assumed to be used by the operator to cool down the unit to RHR entry conditions when the SGTR is accompanied by a loss of offsite power, which renders the condenser dump valves unavailable. Prior to operator actions to cool down the unit, the SG PORVs and main steam safety valves (MSSVs) are assumed to operate automatically to relieve steam and maintain the steam generator pressure below the design value. For the recovery from a steam generator tube rupture (SGTR) event, the operator is also required to perform a limited cooldown to establish adequate subcooling as a necessary step to terminate the primary to secondary break flow into the ruptured steam generator. The time required to terminate the primary to secondary break flow for an SGTR is more critical than the time required to cool down to RHR conditions for this event. Thus, the SGTR is the limiting event for the SG PORVs. The requirement for three SG PORVs to be OPERABLE satisfies the SGTR accident analysis requirements, including consideration of a single failure of one SG PORV to open on demand.

The SG PORVs are equipped with manual isolation valves in the event an SG PORV spuriously fails open or fails to close during use.

The SG PORVs satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Three SG PORV lines are required to be OPERABLE. One SG PORV line is required from each of three steam generators to ensure that at least one SG PORV line is available to conduct a unit cooldown following an SGTR, in which one steam generator becomes unavailable, accompanied by a single, active failure of a second SG PORV line on an unaffected steam generator. The manual isolation valves must be OPERABLE to isolate a failed open SG PORV line. A closed manual isolation valve does not render it or its SG PORV line inoperable because operator action time to open the manual isolation valve is supported in the accident analysis.

(continued)

BASES

LCO (continued)

Failure to meet the LCO can result in the inability to cool the unit to RHR entry conditions following an event in which the condenser is unavailable for use with the Steam Dump System.

An SG PORV is considered OPERABLE when it is capable of providing controlled relief of the main steam flow and capable of fully opening and closing, remotely or by local manual operation on demand.

APPLICABILITY

In MODES 1, 2, and 3, and in MODE 4, when a steam generator is being relied upon for heat removal, the SG PORVs are required to be OPERABLE.

In MODE 5 or 6, an SGTR is not a credible event.

ACTIONS

A.1

With one required SG PORV line inoperable, action must be taken to restore OPERABLE status within 7 days. The 7 day Completion Time allows for the redundant capability afforded by the remaining OPERABLE SG PORV lines, a nonsafety grade backup in the Steam Dump System, and MSSVs. Required Action A.1 is modified by a Note indicating that LCO 3.0.4 does not apply.

B.1

With two or more SG PORV lines inoperable, action must be taken to restore all but one SG PORV line to OPERABLE status. Since the upstream manual isolation valve can be closed to isolate an SG PORV, some repairs may be possible with the unit at power. The 24 hour Completion Time is reasonable to repair inoperable SG PORV lines, based on the availability of the Steam Dump System and MSSVs, and the low probability of an event occurring during this period that would require the SG PORV lines.

C.1 and C.2

If the SG PORV lines cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4, without reliance upon steam

(continued)

BASES

ACTIONS	C.1 and C.2 (continued) generator for heat removal, within 24 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 3.7.4.1 To perform a controlled cooldown of the RCS, the SG PORVs must be able to be opened either remotely or locally and throttled through their full range. This SR ensures that the SG PORVs are tested through a full control cycle at least once per fuel cycle. Performance of inservice testing or use of an SG PORV during a unit cooldown may satisfy this requirement. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. The Frequency is acceptable from a reliability standpoint. SR 3.7.4.2 The function of the upstream manual isolation valve is to isolate a failed SG PORV. Cycling the upstream manual isolation valve both closed and open demonstrates its capability to perform this function. Performance of inservice testing or use of the upstream manual isolation valve during unit cooldown may satisfy this requirement. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. The Frequency is acceptable from a reliability standpoint.
REFERENCES	1. UFSAR, Section 10.3. 2. UFSAR, Section 15.4.3.

B 3.7 PLANT SYSTEMS

B 3.7.5 Auxiliary Feedwater (AFW) System

BASES

BACKGROUND

The AFW System automatically supplies feedwater to the steam generators to remove decay heat from the Reactor Coolant System upon the loss of normal feedwater supply. The AFW pumps take suction through separate and independent suction lines from the emergency condensate storage tank (ECST) (LCO 3.7.6) and pump to the steam generator secondary side via separate and independent connections to the main feedwater (MFW) piping outside containment. The steam generators function as a heat sink for core decay heat. The heat load is dissipated by releasing steam to the atmosphere from the steam generators via the main steam safety valves (MSSVs) (LCO 3.7.1) or steam generator power operated relief valves (SG PORVs) (LCO 3.7.4). If the main condenser is available, steam may be released via the steam dump valves and recirculated to the condenser hotwell.

The AFW System consists of two motor driven AFW pumps and one steam turbine driven pump configured into three trains. Each pump is aligned to one steam generator, and the capacity of each pump is sufficient to provide the designated flow assumed in the accident analysis. The pumps are equipped with recirculation lines to prevent pump operation against a closed system. Each motor driven AFW pump is powered from an independent Class 1E power supply and normally feeds one steam generator, although each pump has the capability to be realigned to feed other steam generators. The steam turbine driven AFW pump receives steam from three main steam lines upstream of the main steam trip valves (MSTVs). The steam supply lines combine into a header which is isolated from the steam driven auxiliary feedwater pump by two parallel valves. Main steam trip valves, MS-TV-111A and MS-TV-111B (Unit 1), MS-TV-211A and MS-TV-211B (Unit 2) are powered from separate 125 V DC trains and actuated by the Engineered Safety Features Actuation System (ESFAS). Opening of either trip valve will provide sufficient steam to the steam driven pump to produce the design flow rate from the ECST to the steam generator(s).

The AFW System is capable of supplying feedwater to the steam generators during normal unit startup, shutdown, and hot standby conditions.

(continued)

BASES

BACKGROUND (continued)

The AFW pumps may be aligned and supply a common header capable of feeding all steam generators. One pump at full flow is sufficient to remove decay heat and cool the unit to residual heat removal (RHR) entry conditions. Thus, the requirement for diversity in motive power sources for the AFW System is met.

The AFW System is designed to supply sufficient water to the steam generator(s) to remove decay heat with steam generator pressure associated with the lowest setpoint MSSV. Subsequently, the AFW System supplies sufficient water to cool the unit to RHR entry conditions, with steam released through the SG PORVs.

The AFW System actuates automatically on Steam Generator Water Level low-low by the ESFAS (LCO 3.3.2). The system also actuates on loss of offsite power, safety injection, and trip of all MFW pumps.

The AFW System is discussed in the UFSAR, Section 10.4.3.2 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The AFW System mitigates the consequences of any event with loss of normal feedwater.

The design basis of the AFW System is to supply water to the steam generator to remove decay heat and other residual heat by delivering at least the minimum required flow rate to the steam generators at pressures corresponding to the lowest steam generator safety valve set pressure plus 3%.

In addition, the AFW System must supply enough makeup water to replace steam generator secondary inventory lost as the unit cools to MODE 4 conditions. Sufficient AFW flow must also be available to account for flow losses such as pump recirculation and line breaks.

The limiting Design Basis Accidents (DBAs) and transients for the AFW System are as follows:

a. Feedwater Line Break (FWLB);

b. Main Steam Line Break (MSLB); and

c. Loss of MFW.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

In addition, the minimum available AFW flow and system characteristics are considerations in the analysis of a small break loss of coolant accident (LOCA).

The AFW System design is such that it can perform its function following an FWLB between the MFW isolation valves and containment, combined with a loss of offsite power following turbine trip, and a single active failure of the steam turbine driven AFW pump. In such a case, the ESFAS logic may not detect the affected steam generator if the backflow check valve to the affected MFW header worked properly. One motor driven AFW pump would deliver to the broken MFW header at maximum design flow until the problem was detected, and flow terminated by the operator. Sufficient flow would be delivered to the intact steam generator by the redundant AFW pump.

The ESFAS automatically actuates the AFW turbine driven pump when required to ensure an adequate feedwater supply to its dedicated steam generator during loss of power. Air or motor operated valves are provided for each AFW line to control the AFW flow to each steam generator.

The AFW System satisfies the requirements of Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO provides assurance that the AFW System will perform its design safety function to mitigate the consequences of accidents that could result in overpressurization of the reactor coolant pressure boundary. Three independent AFW pumps in three diverse trains are required to be OPERABLE to ensure the availability of AFW capability for all events accompanied by a loss of offsite power and a single failure. This is accomplished by powering two of the pumps from independent emergency buses. The third AFW pump is powered by a different means, a steam driven turbine supplied with steam from a source that is not isolated by closure of the MSTVs.

The AFW System is configured into three trains. The AFW System is considered OPERABLE when the components and flow paths required to provide redundant AFW flow to the steam generators are OPERABLE. This requires that the two motor driven AFW pumps be OPERABLE in two diverse paths, each supplying AFW to separate steam generators. The turbine driven AFW pump is required to be OPERABLE with redundant

(continued)

BASES

LCO (continued)

steam supplies from each of two main steam supply paths through MS-TV-111A and MS-TV-111B (Unit 1), MS-TV-211A and MS-TV-211B (Unit 2), which receive steam from the three main steam lines upstream of the MSTVs. The piping, valves, instrumentation, and controls in the required flow paths also are required to be OPERABLE.

The LCO is modified by a Note indicating that one AFW train, which includes a motor driven pump, is required to be OPERABLE in MODE 4 when the steam generator is relied upon for heat removal. This is because of the reduced heat removal requirements and short period of time in MODE 4 during which the AFW is required and the insufficient steam available in MODE 4 to power the turbine driven AFW pump.

APPLICABILITY

In MODES 1, 2, and 3, the AFW System is required to be OPERABLE in the event that it is called upon to function when the MFW is lost. In addition, the AFW System is required to supply enough makeup water to replace the steam generator secondary inventory, lost as the unit cools to MODE 4 conditions.

In MODE 4 one AFW train is required to be OPERABLE when the steam generator(s) is relied upon for heat removal.

In MODE 5 or 6, the steam generators are not normally used for heat removal, and the AFW System is not required.

ACTIONS

A.1

If one of the two steam supplies, MS-TV-111A and MS-TV-111B (Unit 1), MS-TV-211A and MS-TV-211B (Unit 2), to the turbine driven AFW train is inoperable or if a turbine driven AFW pump is inoperable while in MODE 3 immediately following refueling, action must be taken to restore the inoperable equipment to an OPERABLE status within 7 days. The 7 day Completion Time is reasonable, based on the following reasons:

a. For the inoperability of a steam supply to the turbine driven AFW pump, the 7 day Completion Time is reasonable since there is a redundant steam supply line for the turbine driven pump.

(continued)

BASES

ACTIONS

A.1 (continued)

b. For the inoperability of a turbine driven AFW pump while in MODE 3 immediately subsequent to a refueling outage, the 7 day Completion Time is reasonable due to the minimal decay heat levels in this situation.

c. For both the inoperability of a steam supply line to the turbine driven pump and an inoperable turbine driven AFW pump while in MODE 3 immediately following a refueling outage, the 7 day Completion Time is reasonable due to the availability of redundant OPERABLE motor driven AFW pumps; and due to the low probability of an event requiring the use of the turbine driven AFW pump.

The second Completion Time for Required Action A.1 establishes a limit on the maximum time allowed for any combination of Conditions during any contiguous failure to meet this LCO.

The 10 day Completion Time provides a limitation time allowed in this specified Condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The AND connector between 7 days and 10 days dictates that both Completion Times apply simultaneously, and the more restrictive must be met.

Condition A is modified by a Note which limits the applicability of the Conditions to when the unit has not entered MODE 2 following a refueling. Condition A allows the turbine driven AFW train to be inoperable for 7 days vice the 72 hour Completion Time in Condition B. This longer Completion Time is based on the reduced decay heat following refueling and prior to the reactor being critical.

B.1

With one of the required AFW trains (pump or flow path) inoperable in MODE 1, 2, or 3 for reasons other than Condition A, action must be taken to restore OPERABLE status within 72 hours. This Condition includes the loss of two steam supply lines to the turbine driven AFW pump. The 72 hour Completion Time is reasonable, based on redundant

(continued)

BASES

ACTIONS

B.1 (continued)

capabilities afforded by the AFW System, time needed for repairs, and the low probability of a DBA occurring during this time period.

The second Completion Time for Required Action B.1 establishes a limit on the maximum time allowed for any combination of Conditions to be inoperable during any contiguous failure to meet this LCO.

The 10 day Completion Time provides a limitation time allowed in this specified Condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The AND connector between 72 hours and 10 days dictates that both Completion Times apply simultaneously, and the more restrictive must be met.

C.1 and C.2

When Required Action A.1 or B.1 cannot be completed within the required Completion Time, or if two AFW trains are inoperable in MODE 1, 2, or 3, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within 12 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.

In MODE 4, when the steam generator is relied upon for heat removal, with two AFW trains inoperable, operation is allowed to continue because only one motor driven pump AFW train is required in accordance with the Note that modifies the LCO. Although not required, the unit may continue to cool down and initiate RHR.

D.1

If all three AFW trains are inoperable in MODE 1, 2, or 3, the unit is in a seriously degraded condition with no safety related means for conducting a cooldown, and only limited means for conducting a cooldown with nonsafety related equipment. In such a condition, the unit should not be

(continued)

BASES

ACTIONS

D.1 (continued)

perturbed by any action, including a power change, that might result in a trip. The seriousness of this condition requires that action be started immediately to restore one AFW train to OPERABLE status.

Required Action D.1 is modified by a Note indicating that all required MODE changes or power reductions required by the Technical Specifications are suspended until one AFW train is restored to OPERABLE status. In this case, LCO 3.0.3 is not applicable because it could force the unit into a less safe condition.

E.1

In MODE 4, either the reactor coolant pumps or the RHR loops can be used to provide forced circulation. This is addressed in LCO 3.4.6, "RCS Loops—MODE 4." With the required AFW train inoperable, action must be taken to immediately restore the inoperable train to OPERABLE status. The immediate Completion Time is consistent with LCO 3.4.6.

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

Verifying the correct alignment for manual, power operated, and automatic valves in the AFW System water and steam supply flow paths provides assurance that the proper flow paths will exist for AFW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

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

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.5.2

Verifying that each AFW pump's developed head at the flow test point is greater than or equal to the required developed head ensures that AFW pump performance has not degraded during the cycle. Flow and differential head are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref 2). Because it is sometimes undesirable to introduce cold AFW into the steam generators while they are operating, this testing is typically performed on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. Performance of inservice testing discussed in the ASME Code, Section XI (Ref. 2) (only required at 3 month intervals) satisfies this requirement.

This SR is modified by a Note indicating that the SR should be deferred until suitable test conditions are established. This deferral is required because there may be insufficient steam pressure to perform the test.

SR 3.7.5.3

This SR verifies that AFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates an ESFAS, by demonstrating that each automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 18 month Frequency is acceptable based on operating experience and the design reliability of the equipment.

This SR is modified by a Note that states the SR is not required in MODE 4. In MODE 4, the heat removal requirements would be less providing more time for operator action to manually align the required valves.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.5.4

This SR verifies that the AFW pumps will start in the event of any accident or transient that generates an ESFAS by demonstrating that each AFW pump starts automatically on an actual or simulated actuation signal in MODES 1, 2, and 3. In MODE 4, the required pump's autostart function is not required. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.

This SR is modified by two Notes. Note 1 indicates that the SR be deferred until suitable test conditions are established. This deferral is required because there may be insufficient steam pressure to perform the test. Note 2 states that the SR is not required in MODE 4. In MODE 4, the heat removal requirements would be less providing more time for operator action to manually start the required AFW pump.

SR 3.7.5.5

This SR verifies that the AFW is properly aligned by verifying the flow paths from the ECST to each steam generator prior to entering MODE 3 after more than 30 contiguous days in any combination of MODES 5, 6, or defueled. OPERABILITY of AFW flow paths must be verified before sufficient core heat is generated that would require the operation of the AFW System during a subsequent shutdown. The Frequency is reasonable, based on engineering judgement and other administrative controls that ensure that flow paths remain OPERABLE. To further ensure AFW System alignment, flow path OPERABILITY is verified following extended outages to determine no misalignment of valves has occurred. This SR ensures that the flow path from the ECST to the steam generators is properly aligned.

REFERENCES

1. UFSAR, Section 10.4.3.2.

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

Intentionally Blank

B 3.7 PLANT SYSTEMS

B 3.7.6 Emergency Condensate Storage Tank (ECST)

BASES

BACKGROUND

The ECST provides a safety grade source of water to the steam generators for removing decay and sensible heat from the Reactor Coolant System (RCS). The ECST provides a passive flow of water, by gravity, to the Auxiliary Feedwater (AFW) System (LCO 3.7.5). The steam produced is released to the atmosphere by the main steam safety valves (MSSVs) or the steam generator power operated relief valves (SG PORVs). The AFW pumps operate with a continuous recirculation to the ECST.

When the main steam trip valves are open, the preferred means of heat removal is to discharge steam to the condenser by the nonsafety grade path of the steam dump valves. The condensed steam is returned to the hotwell and is pumped to the 300,000 gallon condensate storage tank which can be aligned to gravity feed the ECST. This has the advantage of conserving condensate while minimizing releases to the environment.

Because the ECST is a principal component in removing residual heat from the RCS, it is designed to withstand earthquakes and other natural phenomena, including missiles that might be generated by natural phenomena. The ECST is designed to Seismic Category I to ensure availability of the feedwater supply. Feedwater is also available from alternate sources.

A description of the ECST is found in the UFSAR, Section 9.2.4 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The ECST provides cooling water to remove decay heat and to cool down the unit following all events in the accident analysis as discussed in the UFSAR, Chapters 6 and 15 (Refs. 2 and 3, respectively). For anticipated operational occurrences and accidents that do not affect the OPERABILITY of the steam generators, the analysis assumption is 2 hours in MODE 3, steaming through the MSSVs, followed by a 4 hour cooldown to residual heat removal (RHR) entry conditions at the design cooldown rate.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)	The limiting event for the condensate volume is the large feedwater line break coincident with a loss of offsite power. Single failures accommodated by the accident include the following: a. Failure of the diesel generator powering the motor driven AFW pump to one unaffected steam generator (requiring additional steam to drive the remaining AFW pump turbine); and b. Failure of the steam driven AFW pump (requiring a longer time for cooldown using only one motor driven AFW pump). These are not usually the limiting failures in terms of consequences for these events. A nonlimiting event considered in ECST inventory determinations is a break in either the main feedwater or AFW line near where the two join. This break has the potential for dumping condensate until terminated by operator action, since the Engineered Safety Features Actuation System (LCO 3.3.2, ESFAS) starts the AFW system and would not detect a difference in pressure between the steam generators for this break location. This loss of condensate inventory is partially compensated for by the retention of steam generator inventory. The ECST satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	To satisfy accident analysis assumptions, the ECST must contain sufficient cooling water to remove decay heat for 30 minutes following a reactor trip from 102% RTP, and then to cool down the RCS to RHR entry conditions, assuming a coincident loss of offsite power and the most adverse single failure. In doing this, it must retain sufficient water to ensure adequate net positive suction head for the AFW pumps during cooldown, as well as account for any losses from the steam driven AFW pump turbine, or before isolating AFW to a broken line. The ECST level required is equivalent to a contained volume of ≥ 110,000 gallons, which is based on holding the unit in MODE 3 for 8 hours, or maintaining the unit in MODE 3 for 2 hours followed by a 4 hour cooldown to RHR entry

(continued)

BASES

LCO (continued)

conditions within the limit of 100°F/hour. The basis for these times is established in the accident analysis.

The OPERABILITY of the ECST is determined by maintaining the tank level at or above the minimum required level to ensure the minimum volume of water.

APPLICABILITY

In MODES 1, 2, and 3, and in MODE 4, when steam generator is being relied upon for heat removal, the ECST is required to be OPERABLE.

In MODE 5 or 6, the ECST is not required because the AFW System is not required.

ACTIONS

A.1 and A.2

If the ECST is not OPERABLE, the OPERABILITY of the backup supply, the Condensate Storage Tank, should be verified by administrative means within 4 hours and once every 12 hours thereafter. OPERABILITY of the backup feedwater supply must include verification that the flow paths from the backup water supply to the AFW pumps are OPERABLE, and that the backup supply has the required volume of water available. The ECST must be restored to OPERABLE status within 7 days, because the backup supply may be performing this function in addition to its normal functions. The 4 hour Completion Time is reasonable, based on operating experience, to verify the OPERABILITY of the backup water supply. Additionally, verifying the backup water supply every 12 hours is adequate to ensure the backup water supply continues to be available. The 7 day Completion Time is reasonable, based on an OPERABLE backup water supply being available, and the low probability of an event occurring during this time period requiring the ECST.

B.1 and B.2

If the ECST cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4, without reliance on the steam generator for heat removal, within 24 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

This SR verifies that the ECST contains the required volume of cooling water. The 12 hour Frequency is based on operating experience and the need for operator awareness of unit evolutions that may affect the ECST inventory between checks. Also, the 12 hour Frequency is considered adequate in view of other indications in the control room, including alarms, to alert the operator to abnormal deviations in the ECST level.

REFERENCES

1. UFSAR, Section 9.2.4.

2. UFSAR, Chapter 6.

3. UFSAR, Chapter 15.

B 3.7 PLANT SYSTEMS

B 3.7.7 Secondary Specific Activity

BASES

BACKGROUND

Activity in the secondary coolant results from steam generator tube outleakage from the Reactor Coolant System (RCS). Under steady state conditions, the activity is primarily iodines with relatively short half lives and, thus, indicates current conditions. During transients, I-131 spikes have been observed as well as increased releases of some noble gases. Other fission product isotopes, as well as activated corrosion products in lesser amounts, may also be found in the secondary coolant.

A limit on secondary coolant specific activity during power operation minimizes releases to the environment because of normal operation, anticipated operational occurrences, and accidents.

This limit is lower than the activity value that might be expected from a 1 gpm tube leak (LCO 3.4.13, "RCS Operational LEAKAGE") of primary coolant at the limit of 1.0 μCi/gm (LCO 3.4.16, "RCS Specific Activity"). The steam line failure is assumed to result in the release of the noble gas and iodine activity contained in the steam generator inventory, the feedwater, and the reactor coolant LEAKAGE. Most of the iodine isotopes have short half lives, (i.e., < 20 hours).

With the specified activity limit, the resultant 2 hour thyroid dose to a person at the exclusion area boundary (EAB) would be about 0.58 rem if the main steam safety valves (MSSVs) open for 2 hours following a trip from full power.

Operating a unit at the allowable limits could result in a 2 hour EAB exposure of a small fraction of the 10 CFR 100 (Ref. 1) limits, or the limits established as the NRC staff approved licensing basis.

APPLICABLE SAFETY ANALYSES

The accident analysis of the main steam line break (MSLB), as discussed in the UFSAR, Chapter 15 (Ref. 2) assumes the initial secondary coolant specific activity to have a radioactive isotope concentration of 0.10 μCi/gm DOSE EQUIVALENT I-131. This assumption is used in the analysis

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

for determining the radiological consequences of the postulated accident. The accident analysis, based on this and other assumptions, shows that the radiological consequences of an MSLB do not exceed a small fraction of the unit EAB limits (Ref. 1) for whole body and thyroid dose rates.

With the loss of offsite power, the remaining steam generators are available for core decay heat dissipation by venting steam to the atmosphere through the MSSVs and steam generator power operated relief valves (SG PORVs). The Auxiliary Feedwater System supplies the necessary makeup to the steam generators. Venting continues until the reactor coolant temperature and pressure have decreased sufficiently for the Residual Heat Removal System to complete the cooldown.

In the evaluation of the radiological consequences of this accident, the activity released from the steam generator connected to the failed steam line is assumed to be released directly to the environment. The unaffected steam generator is assumed to discharge steam and any entrained activity through the MSSVs and SG PORV during the event. Since no credit is taken in the analysis for activity plateout or retention, the resultant radiological consequences represent a conservative estimate of the potential integrated dose due to the postulated steam line failure.

Secondary specific activity limits satisfy Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

As indicated in the Applicable Safety Analyses, the specific activity of the secondary coolant is required to be $\leq 0.10\ \mu Ci/gm$ DOSE EQUIVALENT I-131 to limit the radiological consequences of a Design Basis Accident (DBA) to a small fraction of the required limit (Ref. 1).

Monitoring the specific activity of the secondary coolant ensures that when secondary specific activity limits are exceeded, appropriate actions are taken in a timely manner to place the unit in an operational MODE that would minimize the radiological consequences of a DBA.

BASES

APPLICABILITY

In MODES 1, 2, 3, and 4, the limits on secondary specific activity apply due to the potential for secondary steam releases to the atmosphere.

In MODES 5 and 6, the steam generators are not being used for heat removal. Both the RCS and steam generators are depressurized, and primary to secondary LEAKAGE is minimal. Therefore, monitoring of secondary specific activity is not required.

ACTIONS

A.1 and A.2

DOSE EQUIVALENT I-131 exceeding the allowable value in the secondary coolant, is an indication of a problem in the RCS and contributes to increased post accident doses. If the secondary specific activity cannot be restored to within limits within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

This SR verifies that the secondary specific activity is within the limits of the accident analysis. A gamma isotopic analysis of the secondary coolant, which determines DOSE EQUIVALENT I-131, confirms the validity of the safety analysis assumptions as to the source terms in post accident releases. It also serves to identify and trend any unusual isotopic concentrations that might indicate changes in reactor coolant activity or LEAKAGE. The 31 day Frequency is based on the detection of increasing trends of the level of DOSE EQUIVALENT I-131, and allows for appropriate action to be taken to maintain levels below the LCO limit.

REFERENCES

1. 10 CFR 100.11.

2. UFSAR, Chapter 15.

Intentionally Blank

B 3.7 PLANT SYSTEMS

B 3.7.8 Service Water (SW) System

BASES

BACKGROUND

The SW System provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation, and a normal shutdown, the SW System also provides this function for various safety related and nonsafety related components. The safety related function is covered by this LCO.

The SW System is common to Units 1 and 2 and is designed for the simultaneous operation of various subsystems and components of both units. The source of cooling water for the SW System is the Service Water Reservoir. The SW System consists of two loops and components can be aligned to operate on either loop. There are four main SW pumps taking suction on the Service Water Reservoir, supplying various components through the supply headers, and then returning to the Service Water Reservoir through the return headers. The main SW pumps are powered from the four emergency buses (two from each unit). There are also two auxiliary SW pumps which take suction on North Anna Reservoir and discharge to the supply header. When the auxiliary SW pumps are in service, the return header may be redirected to waste heat treatment facility if desired. However, the auxiliary SW pumps are strictly a backup to the normal arrangement and are not credited in the analysis for a DBA.

During a design basis loss of coolant accident (LOCA) concurrent with a loss of offsite power to both units, one SW loop will provide sufficient cooling to supply post-LOCA loads on one unit and shutdown and cooldown loads on the other unit. During a DBA, the two SW loops are cross-connected at the recirculation spray (RS) heat exchanger supply and return headers of the accident unit. On a Safety Injection (SI) signal on either unit, all four main SW pumps start and the system is aligned for Service Water Reservoir spray operation. On a containment high-high pressure signal the accident unit's Component Cooling (CC) heat exchangers are isolated from the SW System and its RS heat exchangers are placed into service. All safety-related systems or components requiring cooling during an accident

(continued)

BASES

BACKGROUND (continued)

are cooled by the SW System, including the RS heat exchangers, main control room air conditioning condensers, and charging pump lubricating oil and gearbox coolers.

The SW System also provides cooling to the instrument air compressors, which are not safety-related, and the non-accident unit's CC heat exchangers, and serves as a backup water supply to the Auxiliary Feedwater System, the spent fuel pool coolers, and the containment recirculation air cooling coils. The SW System has sufficient redundancy to withstand a single failure, including the failure of an emergency diesel generator on the affected unit.

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

APPLICABLE SAFETY ANALYSES

The design basis of the SW System is for one SW loop, in conjunction with the RS System, to remove core decay heat following a design basis LOCA as discussed in the UFSAR, Section 6.2.2 (Ref. 2). This prevents the containment sump fluid from increasing in temperature, once the cooler RWST water has reached equilibrium with the fluid in containment, during the recirculation phase following a LOCA and provides for a gradual reduction in the temperature of this fluid which is supplied to the Reactor Coolant System by the ECCS pumps. The SW System also prevents the buildup of containment pressure from exceeding the containment design pressure by removing heat through the RS System heat exchangers. The SW System is designed to perform its function with a single failure of any active component, assuming the loss of offsite power.

The SW System, in conjunction with the CC System, also cools the unit from residual heat removal (RHR), as discussed in the UFSAR, Section 5.5.4, (Ref. 3) entry conditions to MODE 5 during normal and post accident operations. The time required for this evolution is a function of the number of CC and RHR System trains that are operating.

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

BASES

LCO

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

A SW loop is considered OPERABLE during MODES 1, 2, 3, and 4 when:

a. Two SW pumps are OPERABLE in an OPERABLE flow path; and

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

APPLICABILITY

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

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

ACTIONS

A.1

If one SW pump is inoperable, the flow resistance of the system must be adjusted within 72 hours by throttling component cooling water heat exchanger flows to ensure that design flows to the RS System heat exchangers are achieved following an accident. The required resistance is obtained by throttling SW flow through the CC heat exchangers. In this configuration, a single failure disabling a SW pump would not result in loss of the SW System function.

B.1 and B.2

If one or more SW System loops are inoperable due to only two SW pumps being OPERABLE, the flow resistance of the system must be adjusted within one hour to ensure that design flows to the RS System heat exchangers are achieved if no additional failures occur following an accident. The required resistance is obtained by throttling SW flow through the CC heat exchangers. Two SW pumps aligned to one loop or one SW pump aligned to each loop is capable of performing the safety function if CC heat exchanger flow is

(continued)

ACTIONS

B.1 and B.2 (continued)

properly throttled. However, overall reliability is reduced because a single failure disabling a SW pump could result in loss of the SW System function. The one hour time reflects the need to minimize the time that two pumps are inoperable and CC heat exchanger flow is not properly throttled, but is a reasonable time based on the low probability of a DBA occurring during this time period. Restoring one SW pump to OPERABLE status within 72 hours together with the throttling ensures that design flows to the RS System heat exchangers are achieved following an accident. The required resistance is obtained by throttling SW flow through the CC heat exchangers. In this configuration, a single failure disabling a SW pump would not result in loss of the SW System function.

C.1

If one SW loop is inoperable for reasons other than Condition A, action must be taken to restore the loop to OPERABLE status.

In this Condition, the remaining OPERABLE SW loop is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE SW loop could result in loss of SW System function. The inoperable SW loop is required to be restored to OPERABLE status within 72 hours unless the criteria for a 7 day Completion Time are met, as stated in the 72 hour Completion Time Note. The 7 day Completion Time applies if the three criteria in the 7 day Completion Time Note are met.

The first criterion in the 7 day Completion Time Note states that the 7 day Completion Time is only applicable if the inoperability of one SW loop is part of SW System upgrades. Service Water System upgrades include modification and maintenance activities associated with the installation of new discharge headers and spray arrays, mechanical and chemical cleaning of SW System piping and valves, pipe repair and replacement, valve repair and replacement, installation of corrosion mitigation measures and inspection of and repairs to buried piping interior coatings and pump or valve house components. The second criterion in the 7 day Completion Time Note states that the 7 day Completion Time is only applicable if three SW pumps are OPERABLE from initial Condition entry, including one SW pump being allowed to not have automatic start capability. The third criterion in the

(continued)

BASES

ACTIONS

C.1 (continued)

7 day Completion Time Note states that the 7 day Completion Time is only applicable if two auxiliary SW pumps are OPERABLE from initial Condition entry. The 72 hour and 7 day Completion Times are both based on the redundant capabilities afforded by the OPERABLE loop, and the low probability of a DBA occurring during this time period. The 7 day Completion Time also credits the redundant capabilities afforded by three OPERABLE SW pumps (one without automatic start capability) and two OPERABLE auxiliary SW pumps.

D.1 and D.2

If the SW pumps or loop cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

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

E.1 and E.2

If two SW loops are inoperable for reasons other than only two SW pumps being OPERABLE, the SW System cannot perform the safety function. With two SW loops inoperable, the CC System and, consequently, the Residual Heat Removal (RHR) System have no heat sink and are inoperable. Twelve hours is allowed to enter MODE 4, in which the Steam Generators can be used for decay heat removal to maintain reactor temperature. Twelve hours is reasonable, based on operating experience, to reach MODE 4 from full power conditions in an orderly manner and without challenging unit systems. The unit may then remain in MODE 4 until a method to further cool the units becomes available, but actions to determine a method and cool the unit to a condition outside of the Applicability must be initiated within one hour and continued in a reasonable manner and without delay until the unit is brought to MODE 5.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

This SR is modified by a Note indicating that the isolation of the SW System components or systems may render those components inoperable, but does not affect the OPERABILITY of the SW System.

Verifying the correct alignment for manual, power operated, and automatic valves in the SW System flow path provides assurance that the proper flow paths exist for SW System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

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

SR 3.7.8.2

This SR verifies proper automatic operation of the SW System valves on an actual or simulated actuation signal. The SW System is a normally operating system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit 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 is acceptable from a reliability standpoint.

SR 3.7.8.3

This SR verifies proper automatic operation of the SW pumps on an actual or simulated actuation signal. The SW System is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. The 18 month Frequency is based on the need to perform this Surveillance

(continued)

BASES

SURVEILLANCE REQUIREMENTS	SR 3.7.8.3 (continued) under the conditions that apply during a unit 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 is acceptable from a reliability standpoint.
REFERENCES	1. UFSAR, Section 9.2.1. 2. UFSAR, Section 6.2.2. 3. UFSAR, Section 5.5.4.

Intentionally Blank

B 3.7 PLANT SYSTEMS

B 3.7.9 Ultimate Heat Sink (UHS)

BASES

BACKGROUND

The UHS provides a heat sink for processing and operating heat from safety related components during a transient or accident, as well as during normal operation. This is done by utilizing the Service Water (SW) System.

The ultimate heat sink is the Service Water Reservoir and its associated retaining structures, and is the normal source of service water for Units 1 and 2.

The Service Water Reservoir is located approximately 500 ft. south of the station site area. The Service Water Reservoir is adequate to provide sufficient cooling to permit simultaneous safe shutdown and cooldown of both units, and then maintain them in a safe-shutdown condition. Further, in the event of a design basis loss of coolant accident (LOCA) in one unit concurrent with a loss of offsite power to both units, the Service Water Reservoir is designed to provide sufficient water inventory to supply post-LOCA loads on one unit and shutdown and cooldown loads on the other unit and maintain them in a safe-shutdown condition for at least 30 days without makeup. After 30 days, makeup to the Service Water Reservoir is provided from the North Anna Reservoir as necessary to maintain cooling water inventory, ensuring a continued cooling capability. The Service Water Reservoir spray system is designed for operation of two units based on the occurrence of a LOCA on one unit with cooldown of the non-accident unit and simultaneous loss of offsite power to both units.

The two principal functions of the UHS are the dissipation of residual heat after reactor shutdown, and dissipation of residual heat after an accident.

The North Anna Reservoir provides a backup source of service water using the auxiliary SW pumps, and can provide makeup water to the Service Water Reservoir using the Circulating Water screen wash pumps, but is not credited for the DBA. The Lake Anna Dam impounds a lake with a surface area of 13,000 acres and 305,000 acre-ft. of storage, at its normal-stage elevation of 250 ft., along the channel of the North Anna River. The lake is normally used by the power station as

(continued)

BASES

BACKGROUND (continued)	a cooling pond for condenser circulating water. To improve the thermal performance of the lake, it has been divided by a series of dikes and canals into two parts. The larger, referred to as the North Anna Reservoir, is 9600 acres. The smaller part, called the waste heat treatment facility, is 3400 acres. When the North Anna Reservoir is used by the SW System, water is withdrawn from the North Anna Reservoir and discharged to the waste heat treatment facility, though it is possible to discharge water to the Service Water Reservoir. The two sources of water are independent, and each has separate, redundant supply and discharge headers. The only common points are the main redundant supply and discharge headers in the service building where distribution to the components takes place. These common headers are encased in concrete. Additional information on the design and operation of the system, along with a list of components served, can be found in Reference 1.
APPLICABLE SAFETY ANALYSES	The UHS is the sink for heat removed from the reactor core following all accidents and anticipated operational occurrences in which the unit is cooled down and placed on residual heat removal (RHR) operation. Its maximum post accident heat load occurs in the first hour after a design basis LOCA. During this time, the Recirculation Spray (RS) subsystems have started to remove the core decay heat. The operating limits are based on conservative heat transfer analyses for the worst case LOCA. The analyses provide the details of the assumptions used in the analysis, which include worst expected meteorological conditions, conservative uncertainties when calculating decay heat, and the worst case single active failure (e.g., single failure of an EDG). The UHS is designed in accordance with the Regulatory Guide 1.27 (Ref. 2) requirement for a 30 day supply of cooling water in the UHS. The UHS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

The UHS is required to be OPERABLE. The UHS is considered OPERABLE if it contains a sufficient volume of water at or below the maximum temperature that would allow the SW System to operate for at least 30 days following the design basis LOCA without the loss of net positive suction head (NPSH), and without exceeding the maximum design temperature of the equipment served by the SW System. To meet this condition, the Service Water Reservoir temperature should not exceed 95°F and the level should not fall below 313 ft mean sea level during normal unit operation.

APPLICABILITY

In MODES 1, 2, 3, and 4, the UHS is required to support the OPERABILITY of the equipment serviced by the UHS and required to be OPERABLE in these MODES.

In MODE 5 or 6, the OPERABILITY requirements of the UHS are determined by the systems it supports.

ACTIONS

A.1 and A.2

If the UHS is inoperable, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

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

SURVEILLANCE REQUIREMENTS

SR 3.7.9.1

This SR verifies that adequate long term (30 day) cooling can be maintained. The specified level also ensures that sufficient NPSH is available to operate the SW pumps. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. This SR verifies that the Service Water Reservoir water level is ≥ 313 ft mean sea level, USGS datum.

BASES

SURVEILLANCE REQUIREMENTS (continued)	SR 3.7.9.2 This SR verifies that the SW System is available with the maximum accident or normal design heat loads for 30 days following a Design Basis Accident. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. This SR verifies that the average water temperature of the Service Water Reservoir is ≤ 95°F as measured at the service water pump outlet.
REFERENCES	1. UFSAR, Section 9.2. 2. Regulatory Guide 1.27, March, 1974.

B 3.7 PLANT SYSTEMS

B 3.7.10 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS)—MODES 1, 2, 3, and 4

BASES

BACKGROUND

The MCR/ESGR Emergency Habitability System (EHS) provides a protected environment from which operators can control the unit following an uncontrolled release of radioactivity. The MCR/ESGR EHS consists of the MCR/ESGR bottled air system (LCO 3.7.13) and the MCR/ESGR EVS (LCO 3.7.10 and LCO 3.7.14).

The MCR/ESGR EVS consists of four redundant trains that can filter and recirculate air inside the MCR/ESGR envelope, or supply filtered air to the MCR/ESGR envelope. The two independent and redundant unit MCR/ESGR EVS trains can actuate automatically in recirculation. Either of these trains can also be aligned to provide filtered outside air for pressurization when appropriate. One train from the other unit is required for redundancy, and can be manually actuated to provide filtered outside air or to recirculate and filter air approximately 60 minutes after the event. Each train consists of a heater, demister filter, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, valves, dampers, and instrumentation also form part of the system. Two EVS trains are capable of performing the safety function, one supplying outside filtered air for pressurization, one filtering recirculated air. Two LCO 3.7.10.a trains and one LCO 3.7.10.b train are required for independence and redundancy.

Upon receipt of the actuating signal(s), normal air supply to and exhaust from the MCR/ESGR envelope is isolated, the two LCO 3.7.10.a trains of MCR/ESGR EVS actuate to recirculate air, and airflow from the bottled air banks maintains a positive pressure in the MCR/ESGR envelope. The MCR/ESGR envelope consists of the MCR, ESGRs, computer rooms, logic rooms, instrument rack rooms, air conditioning rooms, battery rooms, the MCR toilet, and the stairwell behind the MCR. Approximately 60 minutes after actuation of the MCR/ESGR bottled air system, a single MCR/ESGR EVS train is manually actuated to provide filtered outside air to the MCR/ESGR envelope through HEPA filters and charcoal

(continued)

BASES

BACKGROUND (continued)

adsorbers for pressurization. The demisters remove any entrained water droplets present, to prevent excessive moisture loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 10 hours per month, with the heaters on, reduces moisture buildup on the HEPA filters and adsorbers. Both the demister and heater are important to the effectiveness of the HEPA filters and charcoal adsorbers.

Pressurization of the MCR/ESGR envelope prevents infiltration of unfiltered air from the surrounding areas of the envelope.

A single train of the MCR/ESGR EVS will pressurize the MCR/ESGR envelope to ≥ 0.04 inches water gauge. The MCR/ESGR EHS operation in maintaining the MCR/ESGR envelope habitable is discussed in the UFSAR, Section 6.4 (Ref. 1).

Redundant MCR/ESGR EVS supply and recirculation trains provide the required pressurization and filtration should an excessive pressure drop develop across the other filter train. Normally closed isolation dampers are arranged in series pairs so that the failure of one damper to open will not result in an inability of the system to perform the function based on the presence of the redundant train. The MCR/ESGR EHS is designed in accordance with Seismic Category I requirements. The actuation signal will only start the LCO 3.7.10.a MCR/ESGR EVS trains. Requiring both LCO 3.7.10.a MCR/ESGR EVS trains provides redundancy, assuring that at least one train starts in recirculation when the actuation signal is received.

The MCR/ESGR EHS is designed to maintain the control room environment for 30 days of continuous occupancy after a DBA without exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 3), and NUREG-0800, Section 6.4 (Ref. 4).

APPLICABLE SAFETY ANALYSES

The MCR/ESGR EVS components are arranged in redundant, safety related ventilation trains. The location of most components and ducting within the MCR/ESGR envelope ensures an adequate supply of filtered air to all areas requiring access. The MCR/ESGR EHS provides airborne radiological protection for the control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis accident fission product release presented in the UFSAR, Chapter 15 (Ref. 2).

BASES

APPLICABLE SAFETY ANALYSES (continued)

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

The MCR/ESGR EVS—MODES 1, 2, 3, and 4 satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Two independent and redundant MCR/ESGR EVS trains and one other unit independent and redundant MCR/ESGR EVS train are required to be OPERABLE to ensure that at least one train automatically actuates to filter recirculated air in the MCR/ESGR envelope, and at least one train is available to pressurize and to provide filtered air to the MCR/ESGR envelope, assuming a single failure disables one of the two required OPERABLE trains that automatically actuate, or disables the other unit train. Total system failure could result in exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 3), and NUREG-0800, Section 6.4 (Ref. 4), in the event of a large radioactive release.

The MCR/ESGR EVS—MODES 1, 2, 3, and 4 is considered OPERABLE when the individual components necessary to limit operator exposure are OPERABLE in the three required trains of the MCR/ESGR EVS—MODES 1, 2, 3, and 4, which include one other unit train.

An MCR/ESGR EVS train is OPERABLE when the associated:

a. Fan is OPERABLE;

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

c. Heater, ductwork, valves, and dampers are OPERABLE, and air flow can be maintained.

The MCR/ESGR EVS is shared by Unit 1 and Unit 2.

In addition, the MCR/ESGR boundary must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors.

(continued)

BASES

LCO (continued)

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

APPLICABILITY

In MODES 1, 2, 3, and 4, MCR/ESGR EVS must be OPERABLE to control operator exposure during and following a DBA.

ACTIONS

A.1

When one required LCO 3.7.10.a or LCO 3.7.10.b MCR/ESGR EVS train is inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining required OPERABLE MCR/ESGR EVS trains are adequate to perform the MCR/ESGR envelope protection function. However, the overall reliability is reduced because a single failure in the required OPERABLE EVS trains could result in loss of MCR/ESGR EVS function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining trains to provide the required capability.

B.1

If the MCR/ESGR boundary is inoperable in MODE 1, 2, 3, or 4, the MCR/ESGR EVS cannot perform its intended function. Actions must be taken to restore an OPERABLE MCR/ESGR boundary within 24 hours. During the period that the MCR/ESGR 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. 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 MCR/ESGR boundary.

BASES

ACTIONS (continued)

C.1 and C.2

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

D.1

When two or more required LCO 3.7.10.a or LCO 3.7.10.b MCR/ESGR EVS trains are inoperable in MODE 1, 2, 3, or 4 for reasons other than an inoperable MCR/ESGR boundary (i.e., Condition B), the MCR/ESGR EVS 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.

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on the MCR/ESGR EVS are not too severe, testing each required train once every month provides an adequate check of this system. Monthly heater operations dry out any moisture accumulated in the charcoal and HEPA filters from humidity in the ambient air. Each required train must be operated for ≥ 10 continuous hours with the heaters energized. The 31 day Frequency is based on the reliability of the equipment and the two train redundancy availability.

SR 3.7.10.2

This SR verifies that the required MCR/ESGR EVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing the performance of the demister filter, HEPA filter, charcoal adsorber efficiency, minimum and maximum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.10.3

This SR verifies that each LCO 3.7.10.a MCR/ESGR EVS train starts and operates on an actual or simulated actuation signal. The Frequency of 18 months is consistent with performing this test on a refueling interval basis.

SR 3.7.10.4

This SR verifies, by pressurizing the MCR/ESGR envelope, the integrity of the MCR/ESGR envelope, and the assumed inleakage rates of the potentially contaminated air. The MCR/ESGR envelope positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the MCR/ESGR EVS. During the emergency mode of operation, the MCR/ESGR EVS is designed to pressurize the MCR/ESGR envelope $\geq$ 0.04 inches water gauge positive pressure with respect to adjacent areas in order to prevent unfiltered inleakage. The MCR/ESGR EVS is designed to maintain this positive pressure with one train at a makeup flow rate of $\geq$ 900 cfm and $\leq$ 1100 cfm. The Frequency of 18 months on a STAGGERED TEST BASIS is consistent with the guidance provided in NUREG-0800 (Ref. 4).

REFERENCES

1. UFSAR, Section 6.4.
2. UFSAR, Chapter 15.
3. 10 CFR 50, Appendix A.
4. NUREG-0800, Rev. 2, July 1981.

B 3.7 PLANT SYSTEMS

B 3.7.11 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Air Conditioning System (ACS)

BASES

BACKGROUND

The MCR/ESGR ACS provides cooling for the MCR/ESGR envelope following isolation of the MCR/ESGR envelope. The MCR/ESGR ACS also provides cooling for the MCR/ESGR envelope during routine unit operation.

The MCR/ESGR ACS consists of two independent and redundant subsystems that provide cooling of MCR/ESGR envelope air. Each subsystem consists of two air handling units (one for the MCR and one for the ESGR), one chiller in one subsystem and two chillers in the other, valves, piping, instrumentation, and controls to provide for MCR/ESGR envelope cooling. One subsystem has one chiller, the other has two chillers, either of which can be used by that subsystem, but which are not electrically independent from each other.

The MCR/ESGR ACS is an emergency system, parts of which may also operate during normal unit operations. A single subsystem will provide the required cooling to maintain the MCR/ESGR envelope within design limits. The MCR/ESGR ACS operation in maintaining the MCR/ESGR envelope temperature is discussed in the UFSAR, Section 9.4 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The design basis of the MCR/ESGR ACS is to maintain the MCR/ESGR envelope temperature within limits for 30 days of continuous occupancy after a DBA.

The MCR/ESGR ACS components are arranged in redundant, safety related subsystems. During emergency operation, the MCR/ESGR ACS maintains the temperature within design limits. A single active failure of a component of the MCR/ESGR ACS, with a loss of offsite power, does not impair the ability of the system to perform its design function. The MCR/ESGR ACS is designed in accordance with Seismic Category I requirements. The MCR/ESGR ACS is capable of removing sensible and latent heat loads from the MCR/ESGR envelope, which include consideration of equipment heat loads and personnel occupancy requirements, to ensure equipment OPERABILITY.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The MCR/ESGR ACS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Two independent and redundant subsystems of the MCR/ESGR ACS, providing cooling to the unit ESGR and associated portion of the MCR, are required to be OPERABLE to ensure that at least one is available, assuming a single failure disabling the other subsystem. Total system failure could result in the equipment operating temperature exceeding limits in the event of an accident.

The MCR/ESGR ACS is considered to be OPERABLE when the individual components necessary to cool the MCR/ESGR envelope air are OPERABLE in both required subsystems. Each subsystem consists of two air handling units (one for the MCR and one for the ESGR), one chiller, valves, piping, instrumentation and controls. The two subsystems provide air temperature cooling to the portion of the MCR/ESGR envelope associated with the unit. In addition, the MCR/ESGR ACS must be operable to the extent that air circulation can be maintained.

APPLICABILITY

In MODES 1, 2, 3, and 4, and during movement of recently irradiated fuel assemblies, the MCR/ESGR ACS must be OPERABLE to ensure that the MCR/ESGR envelope temperature will not exceed equipment operational requirements following isolation of the MCR/ESGR envelope. The MCR/ESGR ACS 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 a time frame established by analysis. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time), due to radioactive decay.

ACTIONS

A.1

With one required MCR/ESGR ACS subsystem inoperable, and at least 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem available, action must be taken to restore OPERABLE status within 30 days. In this Condition, the remaining OPERABLE MCR/ESGR ACS subsystem is adequate to maintain the MCR/ESGR envelope temperature within limits. However, the overall reliability is reduced

(continued)

BASES

ACTIONS

A.1 (continued)

because a single failure in the OPERABLE MCR/ESGR ACS subsystem could result in loss of MCR/ESGR ACS function. The 30 day Completion Time is based on the low probability of an event requiring MCR/ESGR envelope isolation, the consideration that the remaining subsystem can provide the required protection, and that alternate safety or nonsafety related cooling means are available.

The LCO requires the OPERABILITY of a number of independent components. Due to the redundancy of subsystems and the diversity of components, the inoperability of one active component in a subsystem does not render the MCR/ESGR ACS incapable of performing its function. Neither does the inoperability of two different components, each in a different subsystem, necessarily result in a loss of function for the MCR/ESGR ACS (e.g., an inoperable chiller in one subsystem, and an inoperable air handler in the other). This allows increased flexibility in unit operations under circumstances when components in opposite subsystems are inoperable.

B.1 and B.2

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

C.1 and C.2

During movement of recently irradiated fuel, if the required inoperable MCR/ESGR ACS subsystems cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE MCR/ESGR ACS subsystem must be placed in operation immediately. This action ensures that the remaining subsystem is OPERABLE and that active failures will be readily detected.

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

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 MCR/ESGR envelope. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

D.1

During movement of recently irradiated fuel assemblies, with less than 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem available, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the MCR/ESGR envelope. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

E.1

With less than 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem available in MODE 1, 2, 3, or 4, the MCR/ESGR ACS may not be capable of performing its intended function. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR verifies that the heat removal capability of any one of the three chillers for the unit is sufficient to remove the heat load assumed in the safety analyses in the MCR/ESGR envelope. This SR consists of a combination of testing and calculations. The 18 month on a STAGGERED TEST BASIS Frequency is appropriate since significant degradation of the MCR/ESGR ACS is slow and is not expected over this time period.

REFERENCES

1. UFSAR, Section 9.4.

B 3.7 PLANT SYSTEMS

B 3.7.12 Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS)

BASES

BACKGROUND

The ECCS PREACS filters air from the area of the active ECCS components during the recirculation phase of a loss of coolant accident (LOCA). The ECCS PREACS, in conjunction with other normally operating systems, also provides environmental control of temperature in the ECCS pump room areas.

The ECCS PREACS consists of two redundant trains. Each train consists of one Safeguards Area exhaust fan, prefilter, and high energy particulate air (HEPA) filter and charcoal adsorber assembly for removal of gaseous activity (principally iodines) (shared with the opposite unit), one Auxiliary Building Central exhaust system fan (shared with opposite unit), controls for the Safeguards Area exhaust filter and bypass dampers, and controls for the Auxiliary Building Central exhaust system filter and bypass dampers (shared with the opposite unit). The Auxiliary Building filter banks used are shared by the Auxiliary Building General area and Central area exhaust, fuel building exhaust, decontamination building exhaust, Safeguards Area exhaust, and containment purge exhaust, and, except for the Safeguards Area exhaust, are shared with the opposite unit. Ductwork, valves or dampers, and instrumentation also form part of the system. The system initiates filtered ventilation of the safeguards pump room following receipt of a Containment Hi-Hi signal from either unit.

One Safeguards Area exhaust fan is normally operating and dampers are aligned to bypass the system HEPA filters and charcoal adsorbers. During emergency operations, the ECCS PREACS dampers are realigned to begin filtration. Upon receipt of the actuating Engineered Safety Feature Actuation System signal(s), normal air discharges from the Safeguards Area room are diverted through the system filter trains. Air discharges from the Auxiliary Building Central exhaust area are manually diverted through the system filter trains. Required Safeguards Area and Auxiliary Building Central exhaust area fans are manually actuated if they are not

(continued)

BASES

BACKGROUND (continued)

already operating. The prefilters remove any large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers.

The ECCS PREACS is discussed in the UFSAR, Section 9.4.6 (Ref. 1) and it may be used for normal, as well as post accident, atmospheric cleanup functions. The primary purpose of the heaters is to maintain the relative humidity at an acceptable level during normal operations, generally consistent with iodine removal efficiencies per Regulatory Guide 1.52 (Ref. 3), and are not required for post-accident conditions.

APPLICABLE SAFETY ANALYSES

The design basis of the ECCS PREACS is established by the large break LOCA. The system evaluation assumes ECCS leakage outside containment, such as safety injection pump leakage, during the recirculation mode. In such a case, the system limits radioactive release to within the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 4), and NUREG-0800, Section 6.4 (Ref. 5). The analysis of the effects and consequences of a large break LOCA is presented in Reference 2. The ECCS PREACS also may actuate following a small break LOCA, in those cases where the ECCS goes into the recirculation mode of long term cooling, to clean up releases of smaller leaks, such as from valve stem packing.

The ECCS PREACS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Two redundant trains of the ECCS PREACS are required to be OPERABLE to ensure that at least one is available. Total system failure could result in exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 4), and NUREG-0800, Section 6.4 (Ref. 5).

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

An ECCS PREACS train is considered OPERABLE when its associated:

a. Safeguards Area exhaust fan is OPERABLE;

(continued)

BASES

LCO (continued)

b. One Auxiliary Building HEPA filter and charcoal adsorber assembly (shared with the opposite unit) is OPERABLE;

c. One Auxiliary Building Central exhaust system fan (shared with opposite unit) is OPERABLE;

d. Controls for the Auxiliary Building Central exhaust system filter and bypass dampers (shared with the opposite unit) are OPERABLE;

e. HEPA filter and charcoal adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; and

f. Ductwork, valves, and dampers are OPERABLE.

In addition, the required Safeguards Area and charging pump cubicle boundaries for charging pumps not isolated from the Reactor Coolant System must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors, except for those openings which are left open by design, including charging pump ladder wells.

The LCO is modified by a Note allowing the ECCS pump room boundary openings not open by design to be opened intermittently under administrative controls. For entry and exit through doors the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls consist of stationing a dedicated individual at the opening who is in continuous communication with the control room. This individual will have a method to rapidly close the opening when a need for ECCS pump room isolation is indicated.

APPLICABILITY

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

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

BASES

ACTIONS

A.1

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

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

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

B.1

If the ECCS pump room boundary is inoperable, the ECCS PREACS trains cannot perform their intended functions. Actions must be taken to restore an OPERABLE ECCS pump room boundary within 24 hours. During the period that the ECCS pump 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. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of compensatory measures. The 24 hour Completion Time is a typically reasonable time to diagnose, plan and possibly repair, and test most problems with the ECCS pump room boundary.

C.1 and C.2

If the ECCS PREACS train or ECCS pump room boundary cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

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 3.7.12.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train once a month provides an adequate check on this system. Monthly heater operations dry out any moisture that may have accumulated in the charcoal and HEPA filters from humidity in the ambient air. The system must be operated ≥ 10 continuous hours with the heaters energized. The 31 day Frequency is based on the known reliability of equipment and the two train redundancy available.

SR 3.7.12.2

This SR verifies that Safeguards Area exhaust flow and Auxiliary Building Central exhaust system flow, when actuated from the control room, diverts flow through the Auxiliary Building HEPA filter and charcoal adsorber assembly for the operating train. Exhaust flow is diverted manually through the filters in case of a DBA requiring their use. The 31 day Frequency is based on the known reliability of equipment and the two train redundancy available.

SR 3.7.12.3

This SR verifies that the required ECCS PREACS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, charcoal adsorbers 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.4

This SR verifies that Safeguards Area exhaust flow for the operating Safeguards Area fan is diverted through the filters on an actual or simulated actuation signal. The 18 month Frequency is consistent with that specified in Reference 3.

SR 3.7.12.5

This SR verifies the integrity of the ECCS pump room enclosure. The ability of the ECCS pump room to maintain a negative pressure, with respect to potentially uncontaminated adjacent areas, is periodically tested in a qualitative manner to verify proper functioning of each train of the ECCS PREACS. During the post accident mode of operation, the ECCS PREACS is designed to maintain a slight negative pressure in the ECCS pump room, with respect to adjacent areas, to prevent unfiltered LEAKAGE. A single train of ECCS PREACS is designed to maintain a negative pressure relative to adjacent areas. The Frequency of 18 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 5).

This test is conducted with the tests for filter penetration; thus, an 18 month Frequency on a STAGGERED TEST BASIS is consistent with that specified in Reference 3.

REFERENCES

1. UFSAR, Section 9.4.6.
2. UFSAR, Section 15.4.
3. Regulatory Guide 1.52 (Rev. 2).
4. 10 CFR 50, Appendix A.
5. NUREG-0800, Rev. 2, July 1981.

B 3.7 PLANT SYSTEMS

B 3.7.13 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Bottled Air System

BASES

BACKGROUND

The MCR/ESGR Emergency Habitability System (EHS) provides a protected environment from which operators can control the unit following an uncontrolled release of radioactivity. The MCR/ESGR EHS consists of the MCR/ESGR bottled air system (LCO 3.7.13) and the MCR/ESGR Emergency Ventilation System (EVS) (LCO 3.7.10 and LCO 3.7.14).

The MCR/ESGR bottled air system consists of four trains of bottled air lined up to provide air to the MCR/ESGR envelope when the system actuates. The air is provided via four trains which feed a common header, supplying air to the Unit 1 and Unit 2 ESGRs. The header is also capable of being aligned to supply air directly to the MCR. Each train is provided air by one of the bottled air banks. Unit 1 and Unit 2 each provide two trains of bottled air. Two bottled air trains are capable of providing dry air of breathing quality to maintain a positive interior pressure in the MCR/ESGR envelope for Unit 1 and Unit 2 for a period of one hour following a Design Basis Accident (DBA).

In MODES 1, 2, 3, or 4, upon receipt of the actuating signal(s), normal air supply to and exhaust from the MCR/ESGR envelope is isolated, the two LCO 3.7.10.a trains of MCR/ESGR EVS actuate to recirculate air, and airflow from the bottled air banks maintains a positive pressure in the MCR/ESGR envelope. In case of a Fuel Handling Accident (FHA) during movement of recently irradiated fuel assemblies, automatic actuation of bottled air is not required, and no train of MCR/ESGR EVS is required to recirculate air. The MCR/ESGR envelope consists of the MCR, ESGRs, computer rooms, logic rooms, instrument rack rooms, air conditioning rooms, battery rooms, the MCR toilet, and the stairwell behind the MCR. Approximately 60 minutes after actuation of the MCR/ESGR bottled air system, a single MCR/ESGR EVS train is manually actuated to provide filtered outside air to the MCR/ESGR envelope through high efficiency particulate air (HEPA) filters and charcoal adsorbers for pressurization.

(continued)

BASES

BACKGROUND (continued)

Pressurization of the MCR/ESGR envelope prevents infiltration of unfiltered air from the surrounding areas of the envelope.

Two trains of the MCR/ESGR bottled air system will pressurize the MCR/ESGR envelope to ≥ 0.05 inches water gauge. The MCR/ESGR EHS operation in maintaining the MCR/ESGR envelope habitable is discussed in the UFSAR, Section 6.4 (Ref. 1).

The MCR/ESGR EHS is designed in accordance with Seismic Category I requirements.

The MCR/ESGR EHS is designed to maintain the MCR/ESGR envelope environment for 30 days of continuous occupancy after a DBA without exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 2), and NUREG-0800, Section 6.4 (Ref. 3).

APPLICABLE SAFETY ANALYSES

The MCR/ESGR bottled air system is arranged in redundant, safety related trains providing pressurized air from the required bottled air banks to maintain a habitable environment in the MCR/ESGR envelope.

The MCR/ESGR EHS provides airborne radiological protection for the control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis accident fission product release presented in the UFSAR, Chapter 15 (Ref. 4).

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

The MCR/ESGR bottled air system satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Three independent and redundant MCR/ESGR bottled air system trains are required to be OPERABLE to ensure that at least two are available assuming a single failure disables one train. Total system failure could result in exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 2), and NUREG-0800, Section 6.4 (Ref. 3), in the event of a large radioactive release.

(continued)

BASES

LCO (continued)

The MCR/ESGR bottled air system is considered OPERABLE when the individual components necessary to limit operator exposure are OPERABLE in the three required trains of the MCR/ESGR bottled air system.

A MCR/ESGR bottled air system train is OPERABLE when:

a. One OPERABLE bottled air bank of 51 bottles is in service;

b. A flow path, including associated valves and piping, is OPERABLE; and

c. The common exhaust header is OPERABLE.

The MCR/ESGR bottled air system trains are shared by Unit 1 and Unit 2.

In addition, the MCR/ESGR boundary must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors.

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

APPLICABILITY

In MODES 1, 2, 3, and 4, and during movement of recently irradiated fuel assemblies, MCR/ESGR bottled air system must be OPERABLE to control operator exposure during and following a DBA.

During movement of recently irradiated fuel assemblies, the MCR/ESGR bottled air system must be OPERABLE to respond to the release from a fuel handling accident involving handling recently irradiated fuel. The MCR/ESGR bottled air 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 a time frame established by analysis. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time), due to radioactive decay.

BASES

ACTIONS

A.1

When one required MCR/ESGR bottled air system train is inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining required OPERABLE MCR/ESGR bottled air system trains are adequate to perform the MCR/ESGR envelope protection function. However, the overall reliability is reduced because a single failure in one of the remaining required OPERABLE trains could result in loss of MCR/ESGR bottled air system function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining trains to provide the required capability.

B.1

If the MCR/ESGR boundary is inoperable in MODE 1, 2, 3, or 4, the MCR/ESGR bottled air system cannot perform its intended function. Actions must be taken to restore an OPERABLE MCR/ESGR boundary within 24 hours. During the period that the MCR/ESGR 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. 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 MCR/ESGR boundary.

C.1

When two or more required trains of the MCR/ESGR bottled air system are inoperable in MODE 1, 2, 3, or 4 for reasons other than an inoperable MCR/ESGR boundary (i.e., Condition B), action must be taken to restore at least two of the required MCR/ESGR bottled air system trains to OPERABLE status within 24 hours. During the period that two or more required trains of the MCR/ESGR bottled air system are 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. Preplanned measures should be available to address these concerns for intentional and unintentional

(continued)

BASES

ACTIONS

C.1 (continued)

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, restore, and possibly repair, and test most problems with the MCR/ESGR bottled air system, such as repressurizing the system after an inadvertent actuation.

D.1 and D.2

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

E.1 and E.2

During movement of recently irradiated fuel assemblies, if the required inoperable MCR/ESGR bottled air system train cannot be restored to OPERABLE status within the required Completion Time or two or more required MCR/ESGR bottled air system trains are inoperable, action must be taken to immediately suspend activities that could result in a release of radioactivity that might require isolation of the MCR/ESGR envelope. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.13.1

This SR verifies that each required MCR/ESGR bottled air bank is at the proper pressure. This ensures that when combined with the required number of OPERABLE air bottles, the minimum required air flow will be maintained to ensure the required MCR/ESGR envelope pressurization for approximately 60 minutes when the MCR/ESGR bottled air system is actuated.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.13.2

This SR verifies that the proper number of MCR/ESGR air bottles are in service, with one bank of 51 air bottles in each required train. This SR requires verification that each bottled air bank manual valve not locked, sealed, or otherwise secured and required to be open during accident conditions is open. This SR helps to ensure that the bottled air banks required to be OPERABLE to pressurize the MCR/ESGR boundary are in service. The 31 day Frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions. This SR does not apply to valves that are locked, sealed, or otherwise secured in the open position, since these were verified to be in the correct position prior to locking, sealing, or securing.

SR 3.7.13.3

This SR verifies that each required MCR/ESGR bottled air system train actuates on an actual or simulated actuation signal by verifying the flow path is opened. The Frequency of 18 months is consistent with performing this test on a refueling interval basis.

SR 3.7.13.4

This SR verifies, by pressurizing the MCR/ESGR envelope, the integrity of the MCR/ESGR envelope, and the assumed inleakage rates of the potentially contaminated air. The MCR/ESGR envelope positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the MCR/ESGR bottled air system. During the emergency mode of operation, the MCR/ESGR bottled air system is designed to pressurize the MCR/ESGR envelope to $\geq$ 0.05 inches water gauge positive pressure with respect to adjacent areas in order to prevent unfiltered inleakage. The MCR/ESGR bottled air system is designed to maintain this positive pressure with two trains for at least 60 minutes at a makeup flow rate of $\geq$ 340 cfm. Testing two trains at a time at the Frequency of 18 months on a STAGGERED TEST BASIS is consistent with the guidance provided in NUREG-0800 (Ref. 3).

BASES

REFERENCES

1. UFSAR, Section 6.4.
2. 10 CFR 50, Appendix A.
3. NUREG-0800, Rev. 2, July 1981.
4. UFSAR, Chapter 15.

Intentionally Blank

B 3.7 PLANT SYSTEMS

B 3.7.14 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Emergency Ventilation System (EVS)—During Movement of Recently Irradiated Fuel Assemblies

BASES

BACKGROUND

The MCR/ESGR Emergency Habitability System (EHS) provides a protected environment from which operators can control the unit following an uncontrolled release of radioactivity. The MCR/ESGR EHS consists of the MCR/ESGR bottled air system (LCO 3.7.13) and the MCR/ESGR EVS (LCO 3.7.10 and LCO 3.7.14).

The MCR/ESGR EVS consists of four independent, redundant trains that can filter and recirculate air inside the MCR/ESGR envelope, or supply filtered air to the MCR/ESGR envelope. Each train consists of a heater, demister filter, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, valves and dampers, and instrumentation also form part of the system. One EVS train is capable of performing the safety function, supplying filtered air for pressurization. Two of the four EVS trains are required for independence and redundancy.

In case of a Design Basis Accident (DBA) during movement of recently irradiated fuel assemblies, normal air supply to and exhaust from the MCR/ESGR envelope is manually isolated, and airflow from the bottled air banks is manually actuated to maintain a positive pressure in the MCR/ESGR envelope. The MCR/ESGR envelope consists of the MCR, ESGRs, computer rooms, logic rooms, instrument rack rooms, air conditioning rooms, battery rooms, the MCR toilet, and the stairwell behind the MCR. Approximately 60 minutes after actuation of the MCR/ESGR bottled air system, a single MCR/ESGR EVS train is manually actuated to provide filtered outside air to the MCR/ESGR envelope through HEPA filters and charcoal adsorbers for pressurization. The demisters remove any entrained water droplets present in the air, to prevent excessive moisture loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 10 hours per month, with the heaters on, reduces moisture

(continued)

BASES

BACKGROUND (continued)

buildup on the HEPA filters and adsorbers. Both the demister and heater are important to the effectiveness of the HEPA filters and charcoal adsorbers.

Pressurization of the MCR/ESGR envelope prevents infiltration of unfiltered air from the surrounding areas of the envelope.

A single train of the MCR/ESGR EVS will pressurize the MCR/ESGR envelope to ≥ 0.04 inches water gauge. The MCR/ESGR EHS operation in maintaining the MCR/ESGR envelope habitable is discussed in the UFSAR, Section 6.4 (Ref. 1).

Redundant MCR/ESGR EVS supply trains provide the required pressurization and filtration should an excessive pressure drop develop across the other filter train. Normally closed isolation dampers are arranged in series pairs so that the failure of one damper to open will not result in an inability of the system to perform the function based on the presence of the redundant train. The MCR/ESGR EHS is designed in accordance with Seismic Category I requirements.

The MCR/ESGR EHS is designed to maintain the control room environment for 30 days of continuous occupancy after a DBA without exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 2), and NUREG-0800, Section 6.4 (Ref. 3).

APPLICABLE SAFETY ANALYSES

The MCR/ESGR EVS components are arranged in redundant, safety related ventilation trains. The location of most components and ducting within the MCR/ESGR envelope ensures an adequate supply of filtered air to all areas requiring access. The MCR/ESGR EHS provides airborne radiological protection for the control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis accident fission product release presented in the UFSAR, Chapter 15 (Ref. 4).

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

The MCR/ESGR EVS—During Movement of Recently Irradiated Fuel Assemblies satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

Two independent and redundant MCR/ESGR EVS trains are required to be OPERABLE to ensure that at least one is available assuming a single failure disables the other train. Total system failure could result in exceeding the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 2), and NUREG-0800, Section 6.4 (Ref. 3), in the event of a large radioactive release.

The MCR/ESGR EVS—During Movement of Recently Irradiated Fuel Assemblies is considered OPERABLE when the individual components necessary to limit operator exposure are OPERABLE in the two required trains of the MCR/ESGR EVS—During Movement of Recently Irradiated Fuel Assemblies.

An MCR/ESGR EVS train is OPERABLE when the associated:

a. Fan is OPERABLE;

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

c. Heater, ductwork, valves, and dampers are OPERABLE, and air flow can be maintained.

The MCR/ESGR EVS is shared by Unit 1 and Unit 2.

In addition, the MCR/ESGR boundary must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors.

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

APPLICABILITY

During movement of recently irradiated fuel assemblies, MCR/ESGR EVS—During Movement of Recently Irradiated Fuel Assemblies must be OPERABLE to control operator exposure during and following a DBA.

(continued)

BASES

APPLICABILITY (continued)

During movement of recently irradiated fuel assemblies, the MCR/ESGR EVS must be OPERABLE to respond to the release from a fuel handling accident involving handling recently irradiated fuel. The MCR/ESGR EVS 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 a time frame established by analysis. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time), due to radioactive decay.

ACTIONS

A.1

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

B.1 and B.2

During movement of recently irradiated fuel assemblies, if the required inoperable MCR/ESGR EVS train cannot be restored to OPERABLE status within the required Completion Time or two required MCR/ESGR EVS trains are inoperable, action must be taken to immediately suspend activities that could result in a release of radioactivity that might require isolation of the MCR/ESGR envelope. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.14.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on the MCR/ESGR EVS are not too severe, testing each required train once every month provides an adequate check of this system. Monthly heater operations dry out any moisture accumulated in the charcoal and HEPA

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.14.1 (continued)

filters from humidity in the ambient air. Each required train must be operated for ≥ 10 continuous hours with the heaters energized. The 31 day Frequency is based on the reliability of the equipment and the two train redundancy availability.

SR 3.7.14.2

This SR verifies that the required MCR/ESGR EVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing the performance of the demister filter, HEPA filter, charcoal adsorber efficiency, minimum and maximum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.14.3

This SR verifies, by pressurizing the MCR/ESGR envelope, the integrity of the MCR/ESGR envelope, and the assumed inleakage rates of the potentially contaminated air. The MCR/ESGR envelope positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the MCR/ESGR EVS. During the emergency mode of operation, the MCR/ESGR EVS is designed to pressurize the MCR/ESGR envelope ≥ 0.04 inches water gauge positive pressure with respect to adjacent areas in order to prevent unfiltered inleakage. The MCR/ESGR EVS is designed to maintain this positive pressure with one train at a makeup flow rate of ≥ 900 cfm and ≤ 1100 cfm. The Frequency of 18 months on a STAGGERED TEST BASIS is consistent with the guidance provided in NUREG-0800 (Ref. 3).

REFERENCES

1. UFSAR, Section 6.4.
2. 10 CFR 50, Appendix A.
3. NUREG-0800, Rev. 2, July 1981.
4. UFSAR, Chapter 15.

Intentionally Blank

B 3.7 PLANT SYSTEMS

B 3.7.15 Fuel Building Ventilation System (FBVS)

BASES

BACKGROUND	The FBVS discharges airborne radioactive particulates from the area of the fuel pool following a fuel handling accident. The FBVS, in conjunction with other normally operating systems, also provides environmental control of temperature and humidity in the fuel pool area. The FBVS consists of ductwork, valves and dampers, instrumentation, and two redundant fans. The FBVS, which may also be operated during normal plant operations, discharges air from the fuel building. The FBVS is discussed in the UFSAR, Sections 9.4.5 and 15.4.5 (Refs. 1 and 2, respectively) because it may be used for normal, as well as post accident functions.
APPLICABLE SAFETY ANALYSES	The FBVS design basis is established by the consequences of the limiting Design Basis Accident (DBA), which is a fuel handling accident involving handling recently irradiated fuel. The analysis of the fuel handling accident, given in Reference 2, assumes that all fuel rods in an assembly are damaged. The DBA analysis of the fuel handling accident assumes that the FBVS is functional with one fan operating. The amount of fission products available for release from the fuel building is determined for a fuel handling accident. Due to radioactive decay, FBVS is only required to be OPERABLE during fuel handling accidents involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within a time frame established by analysis. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time). These assumptions and the analysis follow the guidance provided in Regulatory Guide 1.25 (Ref. 3). The fuel handling accident analysis for the fuel building assumes all of the radioactive material available for release is discharged from the fuel building by the FBVS. The FBVS satisfies Criterion 3 of the 10 CFR 50.36(c)(2)(ii).

BASES

LCO

The FBVS is required to be OPERABLE and at least one fan in operation. Total system failure could result in the atmospheric release from the fuel building exceeding the 10 CFR 50, Appendix A, GDC-19 (Ref. 4) limits in the event of a fuel handling accident involving handling recently irradiated fuel.

The FBVS is considered OPERABLE when the individual components are OPERABLE. The FBVS is considered OPERABLE when at least one fan is OPERABLE, the associated FBVS ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.

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

APPLICABILITY

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

ACTIONS

A.1

When the FBVS is inoperable or not in operation during movement of recently irradiated fuel assemblies in the fuel building, action must be taken to place the unit in a condition in which the LCO does not apply. Action must be taken immediately to suspend movement of recently irradiated fuel assemblies in the fuel building. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.15.1

This SR verifies the integrity of the fuel building enclosure. The ability of the fuel building to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.15.1 (continued)

function of the FBVS. The FBVS is designed to maintain a slight negative pressure in the fuel building, to prevent unfiltered LEAKAGE. The FBVS is designed to maintain a ≤ -0.125 inches water gauge with respect to atmospheric pressure. The Frequency of 18 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. 5).

REFERENCES

1. UFSAR, Section 9.4.5.
2. UFSAR, Section 15.4.5.
3. Regulatory Guide 1.25.
4. 10 CFR 50, Appendix A, GDC-19.
5. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.

Intentionally Blank

B 3.7 PLANT SYSTEMS

B 3.7.16 Fuel Storage Pool Water Level

BASES

BACKGROUND	The minimum water level in the fuel storage pool meets the assumptions of iodine decontamination factors following a fuel handling accident. The specified water level shields and minimizes the general area dose when the storage racks are filled to their maximum capacity. The water also provides shielding during the movement of spent fuel. A general description of the fuel storage pool design is given in the UFSAR, Section 9.1.2 (Ref. 1). A description of the Spent Fuel Pool Cooling and Cleanup System is given in the UFSAR, Section 9.1.3 (Ref. 2). The assumptions of the fuel handling accident are given in the UFSAR, Section 15.4.5 (Ref. 3).
APPLICABLE SAFETY ANALYSES	The minimum water level in the fuel storage pool meets the assumptions of the fuel handling accident described in Regulatory Guide 1.25 (Ref. 4). The resultant 2 hour thyroid dose per person at the exclusion area boundary is within the 10 CFR 100 (Ref. 5) limits. According to Reference 4, there is 23 ft of water between the top of the damaged fuel bundle and the fuel pool surface during a fuel handling accident. With 23 ft of water, the assumptions of Reference 4 can be used directly. In practice, this LCO preserves this assumption for the bulk of the fuel in the storage racks. In the case of a single bundle dropped and lying horizontally on top of the spent fuel racks, however, there may be < 23 ft of water above the top of the fuel bundle and the surface, indicated by the width of the bundle. To offset this small nonconservatism, the analysis assumes that all fuel rods fail, although analysis shows that only the first few rows fail from a hypothetical maximum drop. The fuel storage pool water level satisfies Criteria 2 and 3 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

The fuel storage pool water level is required to be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks. The specified water level preserves the assumptions of the fuel handling accident analysis (Ref. 3). As such, it is the minimum required for fuel storage and movement within the fuel storage pool.

APPLICABILITY

This LCO applies during movement of irradiated fuel assemblies in the fuel storage pool, since the potential for a release of fission products exists.

ACTIONS

A.1

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

When the initial conditions for prevention of an accident cannot be met, steps should be taken to preclude the accident from occurring. When the fuel storage pool water level is lower than the required level, the movement of irradiated fuel assemblies in the fuel storage pool is immediately suspended to a safe position. This action effectively precludes the occurrence of a fuel handling accident. This does not preclude movement of a fuel assembly to a safe position.

If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODES 1, 2, 3, and 4, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.16.1

This SR verifies sufficient fuel storage pool water is available in the event of a fuel handling accident. The water level in the fuel storage pool must be checked periodically. The 7 day Frequency is appropriate because the volume in the pool is normally stable. Water level changes are controlled by plant procedures and are acceptable based on operating experience.

(continued)

BASES

SURVEILLANCE REQUIREMENTS	SR 3.7.16.1 (continued) During refueling operations, the level in the fuel storage pool is in equilibrium with the refueling canal, and the level in the refueling canal is checked daily in accordance with SR 3.9.7.1.
REFERENCES	1. UFSAR, Section 9.1.2. 2. UFSAR, Section 9.1.3. 3. UFSAR, Section 15.4.5. 4. Regulatory Guide 1.25. 5. 10 CFR 100.11.

Intentionally Blank

SECTION 3.7 - PLANT SYSTEMS

IMPROVED STANDARD TECHNICAL SPECIFICATIONS

MARKUP AND JUSTIFICATION FOR DEVIATIONS

CTS

3.7 PLANT SYSTEMS

3.7.1 3.7.1 Main Steam Safety Valves (MSSVs)

TSTF-235

3.7.1.1 LCO 3.7.1 Five ~~The~~ MSSVs per steam generator shall be OPERABLE ~~as specified in Table 3.7.1-1 and Table 3.7.1-2.~~

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

------------------------------NOTE------------------------------
Separate Condition entry is allowed for each MSSV.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One steam generators with one MSSV inoperable and the Moderator Temperature Coefficient (MTC) zero or negative at all power levels.	A.1 Reduce THERMAL POWER to less than or equal to 52%.	4 hours
~~A.~~ B. ~~One or more required MSSVs inoperable.~~	~~A.~~ B.1 Reduce THERMAL POWER ~~power~~ to less than or equal to the Maximum Allowable ~~applicable~~ % RTP specified ~~listed~~ in Table 3.7.1-1 for the number of OPERABLE MSSVs.	4 hours
~~B.~~ C. Required Action and associated Completion Time not met. OR One or more steam generators with ≥ 4 MSSVs inoperable ~~less than [two] MSSVs OPERABLE.~~	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

Action a.

Action a.

Action a.

New

New

Insert

TSTF-235

①

Rev. 0

INSERT

One or more steam generators with one MSSV inoperable and the MTC positive at any power levels. OR One or more steam generators with two or more MSSVs inoperable.	AND ------------ NOTE ------------- Only required in MODE 1 ---------------------------------- B.2 Reduce the Power Range Neutron Flux-High reactor trip setpoint to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs.	 36 hours

CTS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.1.1	-------------------NOTE------------------- Only required to be performed in MODES 1 and 2. -- Verify each required MSSV lift setpoint per Table 3.7.1-2 in accordance with the Inservice Testing Program. Following testing, lift setting shall be within ±1%.	In accordance with the Inservice Testing Program

New

Rev. 0

CTS

Table 3.7.1-1 (page 1 of 1)
OPERABLE Main Steam Safety Valves versus
MAXIMUM ALLOWABLE ~~Applicable~~ Power ~~in Percent of RATED THERMAL POWER~~

Table 3.7-1

~~MINIMUM~~ NUMBER OF MSSVs PER STEAM GENERATOR ~~REQUIRED~~ OPERABLE	MAXIMUM ALLOWABLE ~~APPLICABLE~~ POWER (% RTP)
~~5~~	~~≤ 100~~
4	~~≤ 80~~ 52
3	~~≤ 60~~ 37
2	~~≤ 40~~ 21

1

TSTF-235

CTS
Table 3.7-2

Switch Rows

Table 3.7.1-2 (page 1 of 1)
Main Steam Safety Valve Lift Settings

Unit 1 VALVE NUMBER				LIFT SETTING (psig ± [3]%)
STEAM GENERATOR				
#1	#2	[#3]	~~[#4]~~	
MS-SV-101A	MS-SV-101B	MS-SV-101C		1085
MS-SV-102A	MS-SV-102B	MS-SV-102C		1095
MS-SV-103A	MS-SV-103B	MS-SV-103C		1110
MS-SV-104A	MS-SV-104B	MS-SV-104C		1120
MS-SV-105A	MS-SV-105B	MS-SV-105C		1135
Unit 2 VALVE NUMBER				
MS-SV-201A	MS-SV-201B	MS-SV-201C		1085
MS-SV-202A	MS-SV-202B	MS-SV-202C		1095
MS-SV-203A	MS-SV-203B	MS-SV-203C		1110
MS-SV-204A	MS-SV-204B	MS-SV-204C		1120
MS-SV-205A	MS-SV-205B	MS-SV-205C		1135

1

Rev. 0

JUSTIFICATION FOR DEVIATIONS
ITS 3.7.1, MAIN STEAM SAFETY VALVES

1. The brackets are removed and the proper plant specific information/value is provided.

 1

CTS

3.7 PLANT SYSTEMS

3.7.2 Main Steam ~~[Isolation]~~ Trip Valves (MSIVs) 1

LCO 3.7.1.5 LCO 3.7.2 ~~[Four]~~ Three MS~~I~~TVs shall be OPERABLE. 2 1

Appl APPLICABILITY: MODE 1,
MODES 2 and 3 except when all MS~~I~~TVs are closed and ~~[~~de-activated~~]~~. 1

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action	A. One MS~~I~~TV inoperable in MODE 1.	A.1 Restore MS~~I~~TV to OPERABLE status.	~~[8]~~ hours	1 2
Action	B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 2.	6 hours	
Action	C. ---------NOTE--------- Separate Condition entry is allowed for each MS~~I~~TV. ----------------------- One or more MS~~I~~TVs inoperable in MODE 2 or 3.	C.1 Close MS~~I~~TV. AND C.2 Verify MS~~I~~TV is closed.	~~[8]~~ hours Once per 7 days	1 2 1

(continued)

Rev.0

CTS

Action

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
4.7.1.5 SR 3.7.2.1 ------NOTE------ Only required to be performed in MODES 1 and 2. ------------ Isolation Verify ~~closure~~ time of each MSIV is ≤ [4.6] seconds ~~on an actual or simulated actuation signal~~.	In accordance with the [Inservice Testing Program ~~or [18] months~~]

TSTF-289

New: Insert

TSTF-289

INSERT

SR 3.7.2.2	------------------NOTE---------------------- Only required to be performed in MODES 1 and 2. --- Verify each MSTV actuates to the isolation position on an actual or simulated actuation signal.	18 months

1. Changes are made (additions, deletions, and/or changes) to the ISTS, which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The brackets are removed and the proper plant specific information/value is provided.

CTS

New

3.7 PLANT SYSTEMS

Main Feedwater Pump Discharge Valves (MFPDVs),

3.7.3 Main Feedwater Isolation Valves (MFIVs), ~~and~~ Main Feedwater Regulati~~on~~ ng Valves (MFRVs), ~~[and~~ ~~[Associated]~~ Main Feedwater Regulating Bypass Valves~~]~~ (MFRBV).

LCO 3.7.3 ~~[Four]~~ Three MFIVs, three MFPDVs, ~~[four]~~ three MFRVs, ~~[and~~ ~~associated bypass valves]~~ three MFRBVs shall be OPERABLE. (2) (1)

APPLICABILITY: MODES 1, 2, ~~[and 3]~~ except when MFIV, MFPDV, MFRV, ~~[or associated bypass valve]~~ or MFRBV is closed and ~~[de-activated]~~ ~~[or isolated by a closed manual valve]~~. (2) (2)

ACTIONS

-----------------------------------NOTE-----------------------------------
Separate Condition entry is allowed for each valve.

CONDITION	REQUIRED ACTION	COMPLETION TIME	
A. One or more MFIVs inoperable.	A.1 Close or isolate MFIV. AND A.2 Verify by administrative means MFIV is closed or isolated.	~~[72]~~ hours Once per 7 days	(2) (3)
B. One or more MFRVs inoperable.	B.1 Close or isolate MFRV. AND B.2 Verify by administrative means MFRV is closed or isolated.	~~[72]~~ hours Once per 7 days	(2) (3)

(continued)

Rev.0

CTS

New

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more ~~[MFRV or preheater]~~ ~~bypass valves~~ MFRBVs inoperable.	C.1 Close or isolate ~~bypass valve~~ MFRBV. AND C.2 Verify ~~bypass valve~~ MFRBV is closed or isolated by administrative means.	~~[72]~~ hours (2) (1) Once per 7 days (3) (1) (1)
~~D~~ E. Two valves in the same flow path inoperable.	~~D~~ E.1 Isolate affected flow path.	8 hours (1)
~~E~~ F. Required Action and associated Completion Time not met.	~~E~~ F.1 Be in MODE 3. AND ~~E~~ F.2 Be in MODE 4.	6 hours (1) 12 hours (1)

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Verify the ~~closure~~ isolation time of each MFIV, MFRV ~~[, and associated bypass valve]~~ and MFRBV is ≤ ~~[7]~~ 6.98 seconds ~~on an actual or simulated actuation signal~~ and the isolation time of each MFPDV is ≤ 60 seconds.	In accordance with the ~~[~~Inservice Testing Program ~~or [18] months]~~ TSTF-289 (2) (1)

TSTF-289

Insert 2

Rev.0

INSERT 1

D. One or more MFPDV inoperable.	D.1 Close or isolate MFPDV. AND D.2 Verify by administrative means MFPDV is closed or isolated.	72 hours Once per 7 days

INSERT 2

SR 3.7.3.2	Verify each MFIV, MFPDV, MFRV, and MFRBV actuates to the isolation position on an actual or simulated actuation signal.	18 months

1. The North Anna feedwater system consists of three main feedwater pumps with associated Main Feedwater Pump Discharge Valves (MFPDVs) that feed a common header. From this header are three lines feeding the three steam generators. On each line is a Main Feedwater Isolation Valve (MFIV) in series with a Main Feedwater Regulating Valve (MFRV). On a line which bypasses the MFIV and MFRV is the Main Feedwater Regulating Bypass Valve (MFRBV). Each of these valves, the MFPDV, MFIV, MFRV, and MFRBV, close on receipt of a Safety Injection or Steam Generator Water level - High - High signal. The MFIVs and the MFRVs provide single failure protection for each other, The MFPDV and the MFRBV provide single failure protection for each other. Therefore, all four valve types are required to meet the safety analysis assumptions.

2. The brackets are removed and the proper plant specific information/value is provided.

3. ITS Required Actions A.2, B.2, C.2, and added Required Action D.2, are revised to state "Verify by administrative means [MFIV or MFPDV or MFRV or MFRBV] is closed or isolated." The phrase "by administrative means" is added to the ISTS. When the specified valves are closed and isolated, there is no indication available in the Control Room of the valve position. An administrative review to verify that the valves have not been moved provides assurance that the valves are in the correct position.

CTS

SG PORVs
ADVs
3.7.4 ①

New ↓

3.7 PLANT SYSTEMS

3.7.4 Atmospheric Dump Valves (ADVs) STEAM GENERATOR POWER OPERATED RELIEF VALVES (SG PORVs) ①

LCO 3.7.4 [Three] ADV SG PORV lines shall be OPERABLE. ② ①

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required ADV SG PORV line inoperable.	A.1 --------NOTE-------- LCO 3.0.4 is not applicable. -------------------- Restore required ADV SG PORV line to OPERABLE status.	7 days
B. Two or more required ADV SG PORV lines inoperable.	B.1 Restore one all but one ADV SG PORV line to OPERABLE status.	24 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 4 without reliance upon steam generator for heat removal.	6 hours [18] 24 hours

② ①

② ①

②
TSTF-100
①

TSTF-352

Rev. 0

CTS

3.7.4

SGPORVs

ADVs

1

New

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify one complete cycle of each ADV. SGPORV	[18] months
[SR 3.7.4.2	Verify one complete cycle of each ADV SGPORV block manual isolation valve.	[18] months]

2 1 2 1 2

Rev.0

JUSTIFICATION FOR DEVIATIONS
ITS 3.7.4, STEAM GENERATOR POWER OPERATED RELIEF VALVES

1. The brackets are removed and the proper plant specific information/value is provided.

2. Changes are made (additions, deletions, and/or changes) to the ISTS, which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

CTS

3.7 PLANT SYSTEMS

3.7.5 Auxiliary Feedwater (AFW) System

3.7.1.2

LCO 3.7.5 ~~[Three]~~ AFW trains shall be OPERABLE. ①

---NOTE---
~~Only one AFW train, which includes a motor driven pump, is required to be OPERABLE in MODE 4.~~ ①

Appl.

APPLICABILITY: MODES 1, 2, and 3.
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~A. One steam supply to turbine driven AFW pump inoperable.~~ (New)	A.1 Restore ~~steam supply~~ inoperable equipment to OPERABLE status.	~~7 days AND 10 days from discovery of failure to meet the LCO~~ (TSTF-340) ①
B. One AFW train inoperable in MODE 1, 2 or 3 ~~[for reasons other than Condition A]~~. (Action a) OR ---- NOTE ---- Only applicable if MODE 2 has not been entered following refueling. ---- One turbine driven AFW pump inoperable following refueling. (TSTF-340)	B.1 Restore AFW train to OPERABLE status.	72 hours ① ~~AND 10 days from discovery of failure to meet the LCO~~ ①

(continued)

Rev.0

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME
Action a	C. Required Action and associated Completion Time for Condition A [or B] not met.	C.1	Be in MODE 3.	6 hours
		AND		
		C.2	Be in MODE 4.	[18] hours
Action b	OR Two AFW trains inoperable in MODE 1, 2, or 3.			
Action c	D. [Three] AFW trains inoperable in MODE 1, 2, or 3.	D.1	---------NOTE-------- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status. -------------------- Initiate action to restore one AFW train to OPERABLE status.	Immediately
New	E. Required AFW train inoperable in MODE 4.	E.1	Initiate action to restore AFW train to OPERABLE status.	Immediately

Rev. 0

CTS

SURVEILLANCE REQUIREMENTS

CTS	SURVEILLANCE		FREQUENCY	
4.7.1.2.a.1	SR 3.7.5.1	Verify each AFW manual, power operated, and automatic valve in each water flow path, ~~[and in both steam supply flow paths to the steam turbine driven pump,]~~ that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days	③ ①
4.7.1.2.b.1	SR 3.7.5.2	-------------------NOTE------------------- Not required to be performed for the turbine driven AFW pump until ~~[~~24 hours~~]~~ after ≥ ~~[1000]~~ 1005 psig in the steam generator. --- Verify the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head.	~~[31] days on a STAGGERED TEST BASIS~~ In accordance with the Inservice Testing Program	① TSTF-101
4.7.1.2.c.1	SR 3.7.5.3	-------------------NOTE------------------- Not applicable in MODE 4 when steam generator is relied upon for heat removal. --- Verify each AFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~[~~18~~]~~ months	①

(continued)

Rev. 0

CTS

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE		FREQUENCY	
4.7.1.2.c.2	SR 3.7.5.4	------------------NOTES------------------ 1. Not required to be performed for the turbine driven AFW pump until [24 hours] after ≥ [1000] 1005 psig in the steam generator. 2. Not applicable in MODE 4 when steam generator is relied upon for heat removal. --- Verify each AFW pump starts automatically on an actual or simulated actuation signal.	[18] months	①
4.7.1.2.d	SR 3.7.5.5	Verify proper alignment of the required emergency AFW flow paths by verifying flow from the condensate storage tank to each steam generator.	Prior to entering MODE ③ 2, whenever unit has been in MODE 5, ~~or~~ 6, or defueled for a cumulative period of > 30 days	② ④ TSTF-268

1. The brackets have been removed and the proper plant specific information or value has been provided.

2. ITS SR 3.7.5.5 requires the AFW flow paths to be verified prior to entering MODE 2. CTS SR 4.7.1.2.d requires the AFW flow paths to be verified prior to entering MODE 3. The AFW System is assumed to be OPERABLE in MODE 3. Therefore, the CTS requirement to verify the AFW flow paths prior to entering MODE 3 is retained.

3. TSTF-245 provided optional allowances for plants that utilize the AFW System for steam generator level control . North Anna does not use the AFW System for steam generator level control. Therefore, TSTF-245 is not adopted.

4. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

CTS

3.7 PLANT SYSTEMS (1)

3.7.6 Emergency Condensate Storage Tank (CST) (E)

3.7.1.3 LCO 3.7.6 The (E) CST ~~level~~ shall be OPERABLE ~~≥ [110,000 gal]~~. (1) TSTF-140

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action 3.7.1.3.a SR 4.7.1.3.2	A. (E) CST inoperable ~~level not within limit~~.	A.1 Verify by administrative means OPERABILITY of ~~backup water supply~~ Condensate Storage Tank. AND A.2 Restore (E) CST ~~level~~ to OPERABLE STATUS ~~within limit~~.	4 hours AND Once per 12 hours thereafter 7 days	(1) TSTF-140 (1) TSTF-140
Action 3.7.1.3.b	B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4, without reliance on steam generator for heat removal.	6 hours ~~[18]~~ 24 hours	TSTF-352

Rev 0

CTS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
4.7.1.3.1 SR 3.7.6.1	Verify the E CST ~~level is~~ contains ≥ [110,000 gal].	12 hours 1 2 3

JUSTIFICATION FOR DEVIATIONS
ITS 3.7.6, ECST

1. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The brackets are removed and the proper plant specific information/value is provided.

3. This is an editorial change for clarity, for consistency with the Improved Technical Specifications Writer's Guide, for consistency with similar statements in the other ITS Specifications.

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

LCO 3.7.7 Two CCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CCW train inoperable.	A.1	--------NOTE-------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops—MODE 4," for residual heat removal loops made inoperable by CCW. -------------------- Restore CCW train to OPERABLE status.	 72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1	Be in MODE 3.	6 hours
	<u>AND</u>		
	B.2	Be in MODE 5.	36 hours

1

Rev. 0

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	-----NOTE----- Isolation of CCW flow to individual components does not render the CCW System inoperable. ---------- Verify each CCW manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.7.2	Verify each CCW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	[18] months
SR 3.7.7.3	Verify each CCW pump starts automatically on an actual or simulated actuation signal.	[18] months

1

Rev.0

1. The Component Cooling (CC) System at North Anna Power Station (NAPS) does not meet any of the 10 CFR 50.36(c)(2)(ii) criteria for retention in the ITS. Therefore, ISTS 3.7.7, CC, is not being adopted. The primary function of the CC System is to provide cooling water to the Residual Heat Removal (RHR) heat exchangers. Unlike other Westinghouse plants, the RHR System at NAPS does not share components with the Emergency Core Cooling System (ECCS), and thus does not play a role in Design Basis Accident (DBA) mitigation. At NAPS, this post-accident heat removal function is provided primarily by the Recirculation Spray System and the Low Head Safety Injection pumps. For this reason, CC is not required for DBA mitigation, and, like RHR, does not meet Criterion 3 of 10 CFR 50.36(c)(2)(ii) for retention in the Technical Specifications for MODES 1, 2, 3, and 4. The CC System provides additional support functions such as cooling spent fuel pool water, cooling reactor coolant pump motors, cooling letdown flow in the Chemical and Volume Control System, and cooling reactor coolant pump seal-water return flow, as well as containment heat removal during normal operations. None of these support functions meet the criteria for retention in the Technical Specifications. This makes the CC System at NAPS different from the CC System described in the ISTS, and retaining the CC requirement for supporting RHR or any other components not assumed in DBA analysis is inappropriate. The ISTS has been changed to reflect the plant-specific design basis.

CTS

 2

3.7.1.4 3.7 PLANT SYSTEMS

LCO 3.7.18 7 Secondary Specific Activity

3.7.1.4 LCO 3.7.18 The specific activity of the secondary coolant shall be ≤ ~~[0.10]~~ μCi/gm DOSE EQUIVALENT I-131. 2 1

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Specific activity not within limit.	A.1	Be in MODE 3.	6 hours
	AND		
	A.2	Be in MODE 5.	36 hours

Action

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.18.1 7	Verify the specific activity of the secondary coolant is ≤ ~~[0.10]~~ μCi/gm DOSE EQUIVALENT I-131.	31 days

SR3.7.1.4 2 1

Rev. 0

1. The brackets are removed and the proper plant specific information/value is provided and numbering changed to reflect proper ITS sequencing of LCO's.

2. ISTS Specification 3.7.7, Component Cooling Water System, does not appear in the North Anna ITS. In order to preserve the numbering of the subsequent specifications in Section 3.7, ISTS Specification 3.7.17, Secondary Specific Activity, has been renumbered 3.7.7 in the North Anna ITS.

System SWS
3.7.8 (4)

CTS

3.7 PLANT SYSTEMS (SW)

3.7.8 Service Water System (SWS)

3.7.4.1 LCO 3.7.8 Two SWS ~~trains~~ System loops shall be OPERABLE. (4)

APPLICABILITY: MODES 1, 2, 3, and 4.

Action a
Action b
INSERT 1

ACTIONS (1)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. C. One SWS ~~train~~ System loop inoperable for reasons other than Condition A.	A.1 C. ~~--------NOTES-------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," for emergency diesel generator made inoperable by SWS. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops—MODE 4," for residual heat removal loops made inoperable by SWS.~~ ------------------------- Restore SWS ~~train~~ System loop to OPERABLE status.	~~72 hours~~ INSERT 2

Action c
Action d

(4) (1)

(continued)

Rev. 0

INSERT 1

CTS

Action a	A. One SW pump inoperable.	A.1 Throttle SW System flow to Component Cooling Water (CC) heat exchangers.	72 hours
Action b	B. Two SW pumps inoperable.	B.1 Throttle SW System flow to CC heat exchangers. AND B.2 Restore one SW pump to OPERABLE status.	1 hour 72 hours

INSERT 2

CTS

Action c		--------------NOTE-------------- 72 hour Completion Time only required if criteria allowing 7 day Completion Time are not met. ------------------------------------ 72 hours
		AND
Action d		--------------NOTE-------------- Only applicable if: 1. SW loop inoperability is part of SW System upgrades, and 2. Three SW pumps are OPERABLE from initial Condition entry (one SW pump allowed to not have automatic start capability), and 3. Two auxiliary SW pumps are OPERABLE from initial Condition entry. ------------------------------------ 7 days

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION		COMPLETION TIME	
Action b Action c Action d Action e	D B. Required Action(s) and associated Completion Time of Condition B or C A not met.	B.1	Be in MODE 3.	6 hours	(1)
		AND D			
		B.2	Be in MODE 5.	36 hours	

INSERT (2)

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE		FREQUENCY	
4.7.4.1.a	SR 3.7.8.1	-------------------NOTE------------------- Isolation of SW(S) flow to individual components does not render the SW(S) System inoperable. -- Verify each SW(S) System manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days	(4)
4.7.4.1.c	SR 3.7.8.2	Verify each SW(S) System automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	[18] 9 months	(4) (3)
new	SR 3.7.8.3	Verify each SW(S) pump starts automatically on an actual or simulated actuation signal.	[18] 9 months	(4) (3)

Rev. 0

INSERT

CTS

Action e

E. Two SW System loops inoperable for reasons other than only two SW pumps being OPERABLE.	E.1 Be in MODE 4. AND E.2 Initiate actions to be in MODE 5.	12 hours 13 hours

1. The SW System is common to Units 1 and 2 and is designed for the simultaneous operation of various subsystems and components of both units. There are 2 SW loops and most components, including the SW pumps, can be aligned to operate on either loop. All safety-related systems or components requiring cooling during an accident, principally the Recirculation Spray (RS) heat exchangers, are cooled by the SW System.

   The Actions of ISTS 3.7.8 are revised to reflect the North Anna SW System design and licensing Basis. The revisions are consistent with the CTS 3.4.7.1 Actions.

   Condition A requires throttling of the SW flow to the CC heat exchangers when one SW pump is inoperable. This is necessary to ensure that in the event of a DBA with a single failure there is sufficient flow directed to the RS System heat exchangers. 72 hours is allotted to perform the throttling. Operation is allowed to continue once the throttling is accomplished as the system is fully capable of responding to an accident (including a single failure) in this configuration.

   Condition B applies when two SW pumps are inoperable. In this condition the SW flow to the CC heat exchangers must be throttled within 1 hour. This is necessary to ensure that in the event of a DBA, even without a single failure, the SW System is capable of supplying sufficient water to the RS heat exchangers. A SW pump must then be restored within 72 hours or a shutdown is required by Action D. This is consistent with ISTS Action A.1, except Notes 1 and 2 of ISTS Action A.1 are not included. The North Anna emergency diesel generators are air cooled and do not require the SW System for OPERABILITY. The residual heat removal loops are not made inoperable directly by SW system inoperabilities. Therefore, the Notes do not apply to the system design at NAPS.

   Condition C applies when a SW loop is inoperable The format is consistent with ISTS Condition A except that Notes 1 and 2 of ISTS Action A.1 are deleted. However, the Condition C Completion Time includes a Note stating that the 72 hour Completion Time is only required if criteria allowing the 7 day Completion Time are not met. An optional 7 day Completion Time is added with a Note stating that the 7 day Completion Time is only applicable if specific conditions are met. The conditions are that the SW loop inoperability is part of SW System upgrades, at least three SW pumps (one allowed to not have automatic start capability) are Operable, and two auxiliary SW pumps are Operable. This exception, taken from CTS 3.7.4.1 Action d, was granted to North Anna by the NRC in license amendments 152 (Unit 1) and 136 (Unit 2) to facilitate the long-term upgrade of the North Anna SW System. Details on what constitutes SW System upgrades and on the requirements on the SW pumps are contained in the Bases. This allowance is used regularly and it is anticipated that the allowance will be needed after ITS implementation.

   Condition D requires a unit shutdown and has been expanded to apply to Conditions A, B and C.

2. A new Condition, Condition E, is added which applies when two SW loops are inoperable. With two SW loops inoperable, the CC system does not have a heat sink and the CC and consequently the RHR systems are inoperable. Cooldown below MODE 4 is not possible without reliance on RHR. Therefore, Condition E allows 12 hours to reach MODE 4 and the steam generators can be used to maintain the unit in MODE 4. Action must begin within one hour to find and implement a method of moving the unit out of the MODES of applicability (i.e., MODE 5) and Actions must continue until the Applicability is exited. This Condition is consistent with the current licensing basis and is necessary to reflect the North Anna SW System design.

3. The brackets have been removed and the proper plant specific information/value has been provided.

4. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

CTS

3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

3.7.5.1 LCO 3.7.9 The UHS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

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~~ ①
~~B. Required Action and associated Completion Time of Condition A not met.~~ ~~OR~~ Action A. UHS inoperable ~~[for reasons other than Condition A]~~.	~~B~~A.1 Be in MODE 3. AND ~~B~~A.2 Be in MODE 5.	6 hours 36 hours ①

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
4.7.5.1 3.7.5.1.a.1 SR 3.7.9.1 Verify water level of ~~UHS~~ the Service Water Reservoir is ≥ ~~[562]~~ 313 ft ~~[mean sea level]~~.	~~[~~24~~]~~ hours ② ①

(continued)

Rev. 0

CTS

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY	
4.7.5.1 3.7.5.1.a.2	SR 3.7.9.2	Verify average water temperature of ~~UHS~~ the Service Water Reservoir is ≤ ~~[90]~~ 95°F.	24 hours	1 2
	~~SR 3.7.9.3~~	~~Operate each cooling tower fan for ≥ [15] minutes.~~	~~31 days~~	1
	~~SR 3.7.9.4~~	~~Verify each cooling tower fan starts automatically on an actual or simulated actuation signal.~~	~~[18] months~~	1

Rev.0

JUSTIFICATION FOR DEVIATIONS
ITS 3.7.9, ULTIMATE HEAT SINK

1. The Ultimate Heat Sink (UHS) consists of the Service Water Reservoir. North Anna does not utilize cooling towers and Actions and Surveillances regarding cooling towers are deleted.

2. The brackets have been removed and the proper plant specific information/value has been provided.

MCR/ESGR EVS - MODES 1, 2, 3, and 4 ~~CREFS~~ 3.7.10 ②

Main Control Room / Emergency Switchgear Room (MCR/ESGR)

CTS 3.7.7.1

3.7 PLANT SYSTEMS

Ventilation

EVS

3.7.10 ~~Control Room~~ Emergency ~~Filtration~~ System (~~CREFS~~) - MODES 1, 2, 3, and 4 ②

LCO 3.7.10 ~~Two CREFS~~ trains shall be OPERABLE~~.~~: INSERT 2 ⑤

The following MCR/ESGR EVS

INSERT 1 TSTF-287 ③

APPLICABILITY: MODES 1, 2, 3, and 4. ~~[5, and 6,]~~ ~~During movement of irradiated fuel assemblies, [During CORE ALTERATIONS].~~ ⟨See ITS 3.7.14⟩

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ~~CREFS~~ train inoperable. (Action a: required LCO 3.7.10.a or LCO 3.7.10.b MCR/ESGR EVS)	A.1 Restore ~~CREFS~~ train to OPERABLE status.	7 days ⑤
~~B~~ C. Required Action and associated Completion Time of Condition A or B not met ~~in MODE 1, 2, 3, or 4~~. (Action a, Action b)	~~B~~ C.1 Be in MODE 3. AND ~~B~~ C.2 Be in MODE 5.	6 hours / 36 hours TSTF-287 ④
~~C. Required Action and associated Completion Time of Condition A not met [in MODE 5 or 6, or] during movement of irradiated fuel assemblies [, or during CORE ALTERATIONS].~~	~~C.1 -------NOTE------- Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable. ------------------- Place OPERABLE CREFS train in emergency mode.~~ OR	~~Immediately~~ (continued) ⟨See ITS 3.7.14⟩
B. Two ~~CREFS~~ or more required LCO 3.7.10.a or LCO 3.7.10.b MCR/ESGR EVS trains inoperable due to inoperable ~~control room~~ MCR/ESGR boundary ~~in MODES 1, 2, 3, and 4~~. (Action b)	B.1 Restore ~~control room~~ MCR/ESGR boundary to OPERABLE status.	24 hours TSTF-287 ④

⑤

②

Rev. 0

INSERT 1

---NOTE---
The MCR/ESGR boundary may be opened intermittently under administrative control.

INSERT 2

a. Two MCR/ESGR Emergency Ventilation System (EVS) trains;
b. One MCR/ESGR EVS train on the other unit.

CTS

MCR/ESGR EVS - MODES 1, 2, 3, and 4

CREFS 3.7.10

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2.1 Suspend CORE ALTERATIONS. AND C.2.[2] Suspend movement of irradiated fuel assemblies.	Immediately Immediately
D. Two CREFS trains inoperable [in MODE 5 or 6, or] during movement of irradiated fuel assemblies [, or during CORE ALTERATIONS].	D.1 Suspend CORE ALTERATIONS. AND D.[2] Suspend movement of irradiated fuel assemblies.	Immediately Immediately
Action b ⓓ ~~E~~. Two CREFS trains inoperable ~~in MODE 1, 2, 3, or 4~~ for reasons other than Condition B or more required LCO 3.7.10.a or LCO 3.7.10.b MCR/ESGR EVS	ⓓ ~~E~~.1 Enter LCO 3.0.3.	Immediately

See ITS 3.7.14

④ TSTF-287

⑤

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
4.7.7.1.a SR 3.7.10.1 Operate each CREFS required MCR/ESGR EVS train for ~~[≥ 10 continuous hours with the heaters operating or (for systems without heaters)~~ ≥ 15 minutes].	31 days

② ①

(continued)

Rev. 0

 ②

CTS

SURVEILLANCE REQUIREMENTS (continued)

CTS		SURVEILLANCE	FREQUENCY	
NEW	SR 3.7.10.2	Perform required ~~CREFS~~ MCR/ESGR EVS filter testing in accordance with the ~~[~~Ventilation Filter Testing Program (VFTP)~~]~~. LCO 3.7.10.a MCR/ESGR EVS	In accordance with ~~[~~VFTP~~]~~	② ① ⑤
4.7.7.1.d.2	SR 3.7.10.3	Verify each ~~CREFS~~ each required MCR/ESGR EVS train actuates on an actual or simulated actuation signal.	~~[18]~~ 9 months	① ②
4.7.7.1.d.3	SR 3.7.10.4	Verify ~~one~~ ~~CREFS~~ train ~~can~~ maintain 0.04 a positive pressure of ≥ ~~[0.125]~~ inches water gauge, relative to the adjacent ~~[turbine building]~~ areas during the pressurization mode of operation at a makeup flow rate of ~~≤ [3000]~~ ≥ 900 cfm and ≤ 1100 cfm.	~~[18]~~ 9 months on a STAGGERED TEST BASIS	① ① ①

Rev. 0

JUSTIFICATION FOR DEVIATIONS
ITS 3.7.10 - MCR/ESGR EVS - MODES 1, 2, 3, AND 4

1. The brackets are removed and the proper plant specific information/value is provided.

2. Changes are made (additions, deletions, and/or changes) to the ISTS to reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. The Applicability of MODES 5 and 6 is not adopted. The NAPS safety analysis does not identify any DBAs that initiate in these MODES, except a fuel handling accident. A fuel handling accident is addressed by the Applicability, "During movement of recently irradiated fuel assemblies," which is adopted in ITS 3.7.14. References to MODE 5 and 6 requirements in ISTS 3.7.10 Conditions C and D are also not adopted for consistency with the Applicability.

4. References to MODE 1, 2, 3, and 4 in the ACTIONS are deleted because the Applicability for ITS 3.7.10 is only MODE 1, 2, 3, and 4. Conditions addressing movement of irradiated fuel assemblies and CORE ALTERATIONS are addressed in ITS 3.7.14. Subsequent Conditions and Required Actions are renumbered accordingly.

5. A requirement for a third MCR/ESGR EVS train from the other unit is added to ISTS LCO 3.7.10. This reflects the shared system design between the two units, and the fact that both trains belonging to the unit in question, and one train from the other unit, are required in order to perform the safety function and meet single failure criteria. Changes to Conditions and Surveillance Requirements reflect this plant design.

CTS

Emergency Switchgear Room (MCR/ESGR)

3.7 PLANT SYSTEMS

3.7.11 Main Control Room ~~Emergency~~ Air ~~Temperature Control~~ Conditioning System (~~CREATCS~~) ②

3.7.1 LCO 3.7.11 Two MCR/ESGR ~~CREATCS~~ ~~trains~~ subsystems shall be OPERABLE. ②

New APPLICABILITY: MODES 1, 2, 3, and 4, ~~[5, and 6,]~~ ①
During movement of recently irradiated fuel assemblies. TSTF-51
~~[During CORE ALTERATIONS]~~

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
3.7.7.1 Action c	A. One required MCR/ESGR ~~CREATCS~~ ~~train~~ subsystem inoperable.	A.1 Restore MCR/ESGR ~~CREATCS~~ ~~train~~ subsystem to OPERABLE status.	30 days	②
3.7.7.1 - Action c	B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours	
NEW	C. Required Action and associated Completion Time of Condition A not met ~~[in MODE 5 or 6, or]~~ during movement of recently irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~.	C.1 Place OPERABLE MCR/ESGA ~~CREATCS~~ ~~train~~ subsystem in operation. OR ~~C.2.1 Suspend CORE ALTERATIONS.~~ ~~AND~~ C.2 ~~[2]~~ Suspend movement of recently irradiated fuel assemblies.	Immediately ~~Immediately~~ Immediately	② ① TSTF-51 TSTF-51

(continued)

Rev.0

Less than 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem available

CTS

ACTIONS (continued)

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
NEW	D. ~~Two CREATCS trains inoperable [in MODE 5 or 6, or]~~ during movement of recently irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~.	~~D.1 Suspend CORE ALTERATIONS.~~ ~~AND~~	~~Immediately~~	② ① TSTF-51
		D.~~[2]~~ 1 Suspend movement of recently irradiated fuel assemblies.	Immediately	TSTF-51
NEW	E. ~~Two CREATCS trains inoperable~~ in MODE 1, 2, 3, or 4.	E.1 Enter LCO 3.0.3.	Immediately	②

SURVEILLANCE REQUIREMENTS ④

	SURVEILLANCE	FREQUENCY	
NEW	SR 3.7.11.1 Verify each required MCR/ESGR ~~CREATCS~~ ACS chiller ~~train~~ has the capability to remove the assumed heat load.	[18] months on a STAGGERED TEST BASIS	② ①

Rev.0

1. The brackets are removed and the proper plant specific information/value is provided.

2. Changes are made (additions, deletions, and/or changes) to the ISTS to reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. Conditions D and E of ISTS 3.7.11 are modified to required movement of recently irradiated fuel assemblies and LCO 3.0.3 be entered, for the respective Conditions, when less than 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem is available. This description of system requirements is used instead of a reference to two inoperable trains, as described in ISTS 3.7.11, because the MCR/ESGR ACS at NAPS includes a total of three chillers and flexibility in the use of MCR/ESGR ACS components. This allows a variety of system configurations to be established that would provide sufficient cooling capacity to meet the design function. The modification to Conditions D and E allows appropriate flexibility to operation of the system, similar to that used for ISTS 3.5.2, ECCS – Operating. The Conditions still require that when the design function can not be met, that the appropriate Applicability be exited. This change is consistent with plant design and the intent of ISTS 3.7.11. These Conditions are new requirements to the current licensing basis.

4. ISTS SR 3.7.11.1 is modified to verify capability of the chiller instead of the system train to remove the assumed heat load, and STAGGERED TEST BASIS is added to the 18 month Frequency. Chillers are the components in the system most likely to experience performance degradation over time. Testing of the chillers has been conducted as part of the response to Generic Letter 89-13, Service Water System Problems Affecting Safety-Related Equipment. Plant maintenance history for the MCR/ESGR ACS components supports this approach of testing the most vulnerable portion of each subsystem, and it is consistent with the design and testing history of the system. Adding the caveat STAGGERED TEST BASIS is also consistent with the testing guidance, maintenance history, and testing history of the system, which has found that the chillers routinely pass their periodic design load testing. Other components do not require verification beyond that done for the chillers because the other active components such as air handlers do not typically degrade with time or use. Also, the system is in continuous use during normal operations, and failure of a component such as an air handler fan motor would be immediately apparent. This is a new requirement to the current licensing basis.

CTS

3.7 PLANT SYSTEMS

3.7.12 Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS)

3.7.8.1 LCO 3.7.12 Two ECCS PREACS trains shall be OPERABLE.

INSERT 1 TSTF-287 4

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action	A. One ECCS PREACS train inoperable.	A.1 Restore ECCS PREACS train to OPERABLE status.	7 days	
Action	~~B~~ C. Required Action and associated Completion Time not met.	~~B~~ C.1 Be in MODE 3. AND ~~B~~ C.2 Be in MODE 5.	6 hours 36 hours	TSTF-287
	B. Two ECCS PREACS trains inoperable due to inoperable ECCS pump room boundary.	B.1 Restore ECCS pump room boundary to OPERABLE status	24 hours	TSTF-287

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY	
4.7.8.1.a.1	SR 3.7.12.1 Operate each ECCS PREACS train for ~~[~~≥ 10 continuous hours with the heaters operating ~~or (for systems without heaters) ≥ 15 minutes]~~.	31 days	1

(continued)

4.7.8.1.a.1 INSERT 2 7

Rev.0

INSERT 1

-----NOTE-----
The ECCS pump room boundary openings not open by design may be opened intermittently under administrative control.

INSERT 2

SR 3.7.12.2	Actuate each ECCS PREACS train by aligning Safeguards Area exhaust flow and Auxiliary Building Central exhaust flow through the Auxiliary Building HEPA filter and charcoal adsorber assembly.	31 days

CTS

Safeguards Area exhaust flow is diverted and each Auxiliary Building filter bank is actuated

(2)

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE	FREQUENCY	
NEW	SR 3.7.12.~~2~~ (3) Perform required ECCS PREACS filter testing in accordance with the ~~[~~Ventilation Filter Testing Program (VFTP)~~]~~.	In accordance with the ~~[~~VFTP~~]~~	(1) (7)
4.7.8.1.d.2	SR 3.7.12.~~3~~ (4) Verify ~~each ECCS PREACS train actuates~~ on an actual or simulated actuation signal.	~~[~~18~~]~~ months	(1) (7)
NEW	SR 3.7.12.~~4~~ (5) Verify one ECCS PREACS train can maintain a negative pressure ~~≤ [-0.125] inches water gauge~~ relative to ~~atmospheric pressure~~ adjacent areas during the ~~[~~post accident~~]~~ mode of operation ~~at a flow rate of ≤ [3000] cfm~~.	~~[~~18~~]~~ months on a STAGGERED TEST BASIS	(1) (7) (3) (9) (8)
	~~[SR 3.7.12.5 Verify each ECCS PREACS filter bypass damper can be closed.~~	~~[18] months]~~	(6)

Rev. 0

(5)

3.7 PLANT SYSTEMS

3.7.14 Penetration Room Exhaust Air Cleanup System (PREACS)

LCO 3.7.14 Two PREACS trains shall be OPERABLE.

INSERT LCO NOTE

TSTF 287

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One PREACS train inoperable.	A.1 Restore PREACS train to OPERABLE status.	7 days
B. C. Required Action and associated Completion Time not met.	B.1 C.1 Be in MODE 3. AND B.2 C.2 Be in MODE 5.	6 hours 36 hours
B. Two PREACS trains inoperable due to inoperable penetration room boundary.	B.1 Restore penetration room boundary to OPERABLE status.	24 hours

TSTF 287

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.14.1 Operate each PREACS train for [≥ 10 continuous hours with heaters operating or (for systems without heaters) ≥ 15 minutes].	31 days
SR 3.7.14.2 Perform required PREACS filter testing in accordance with the [Ventilation Filter Testing Program (VFTP)].	In accordance with the [VFTP]

(continued)

Rev. 0

5

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
[SR 3.7.14.3	Verify each PREACS train actuates on an actual or simulated actuation signal.	[18] months]
[SR 3.7.14.4	Verify one PREACS train can maintain a pressure ≤ [-0.125] inches water gauge relative to atmospheric pressure during the [post accident] mode of operation at a flow rate of ≤ [3000] cfm.	[18] months on a STAGGERED TEST BASIS]
[SR 3.7.14.5	Verify each PREACS filter bypass damper can be closed.	[18] months]

Rev. 0

1. The brackets are removed and the proper plant specific information/value is provided.

2. The description of what automatically actuates in ISTS 3.7.12.3 is modified from, "each ECCS PREACS train actuates," to, "Safeguards Area exhaust flow is diverted and each Auxiliary Building filter bank is actuated." Certain dampers associated with the Auxiliary Building Central exhaust system are manually actuated, and are not tested as part of ISTS 3.7.12.3. This description is a more accurate representation of what occurs because of plant specific design, and is closer to the description in the CTS.

3. ISTS SR 3.7.12.4 is modified to require one ECCS PREACS train maintain a negative pressure relative to atmospheric pressure during post accident mode of operation, and does not specify a specific pressure or flow rate. The Safeguards Area and Auxiliary Building Central exhaust area are not maintained at a specific negative pressure due to the design of these areas. Also, a specific negative pressure is not assumed as part of the DBA analysis, and the ECCS PREACS flow rate is verified as part of the Ventilation Filter Testing Program.

4. Changes to the ISTS resulting from TSTF-287 are modified. The TSTF-287 changes address maintenance of the area boundary to provide assurance a positive pressure can be maintained in case of an accident. The ECCS PREACS boundary for the charging pump cubicles associated with the Auxiliary Building Central area exhaust fans are enclosed, but do not form an entire pressure boundary because they include openings left open by design during accident conditions. The TSTF 287 LCO NOTE is modified to reflect this plant design.

5. ISTS 3.7.14, Penetration Room Exhaust Air Cleanup System (PREACS), is not adopted. The DBA analysis at NAPS assumes the systems and components addressed by ITS 3.7.12, ECCS PREACS are OPERABLE for sources of contamination in MODES 1, 2, 3, and 4, outside the containment. The DBA analysis assumes that the penetration area is an unfiltered area, making adoption of ISTS 3.7.14 unnecessary.

6. ISTS SR 3.7.12.5, "Verify each ECCS PREACS filter bypass damper can be closed," is not adopted. ITS 3.7.12.2 actuates each ECCS PREACS train by aligning Safeguards Area exhaust flow and Auxiliary Building Central exhaust flow through the Auxiliary Building HEPA filter and charcoal adsorber assembly. ITS SR 3.7.12.4 verifies each ECCS PREACS train actuates on an actual or simulated actuation signal, which at NAPS verifies that each ECCS PREACS train diverts its exhaust flow through the filter on an actual or simulated actuation signal. These surveillances verify proper damper operation, and ISTS SR 3.7.12.5 is unnecessary and would be redundant.

7. A Surveillance Requirement is added, ITS SR 3.7.12.2, to divert Safeguards Area exhaust flow and Auxiliary Building Central exhaust system flow through the Auxiliary Building HEPA filter and charcoal adsorber assembly for the operating

Safeguards Area fan, from the control room, every 31 days. Certain dampers associated with the Auxiliary Building Central exhaust system are manually actuated, and are tested during ITS SR 3.7.12.2. This provides additional assurance that the exhaust flow can be diverted through the filters in case of a DBA requiring their use. Subsequent Surveillance Requirements are renumbered as appropriate.

8. The reference in ITS SR 3.7.12.4 to "atmospheric pressure" with regard to maintaining a negative ECCS PREACS envelope pressure is changed to "adjacent areas." This consistent with the reference in ISTS SR 3.7.10.4, which is a similar surveillance. This is also consistent with the design of the ECCS PREACS and the reference in the ISTS SR 3.7.12.4 Bases. This is a new Surveillance Requirement.

9. A specific flow rate for ITS 3.7.12.5 is not adopted because testing one train of the ECCS PREACS allows the test to be conducted at nominal accident flow, which is a better measure than a specific minimum flow value. One ECCS PREACS trains provides the flow that will occur in case of a DBA. This is consistent with current licensing basis and plant design, and the values used in the Ventilation Filter Testing Program, ITS 5.5.10. This is a new surveillance requirement.

Main Control Room / Emergency Switchgear Room (MCR/ESGR) Bottled Air

MCR/ESGR Bottled Air System

CREFS 3.7.10 13 (2)

CTS

3.7 PLANT SYSTEMS

3.7.7.1 3.7.10 13 Control Room Emergency Filtration System (CREFS) (2)

LCO 3.7.10 Two CREFS trains shall be OPERABLE. (4)

Three MCR/ESGR bottled air system

INSERT 1 TSTF 287

APPLICABILITY: MODES 1, 2, 3, 4, [5, and 6,] and (3)
During movement of recently irradiated fuel assemblies,
[During CORE ALTERATIONS]. TSTF-51

ACTIONS required MCR/ESGR bottled air system (2)

CTS	CONDITION	REQUIRED ACTION	COMPLETION TIME	
Action a	A. One CREFS train inoperable.	A.1 Restore CREFS train to OPERABLE status.	7 days	(2) (4)
Action a Action b	B. C Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4. D E	B.1 Be in MODE 3. AND B.2 Be in MODE 5. B, or C	INSERT 2 6 hours 36 hours	(7) TSTF-287 (7) TSTF-287
NEW	C. D Required Action and associated Completion Time of Condition A not met [in MODE 5 or 6, or] during movement of recently irradiated fuel assemblies [, or during CORE ALTERATIONS].	C.1 --------NOTE-------- Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable. --------------------- Place OPERABLE CREFS train in emergency mode. OR	Immediately	TSTF-287 (1) (3) TSTF-51 (4)

(continued)

or more required MCR/ESGR bottled air system (4)

NEW	B. Two CREFS trains inoperable due to inoperable control room boundary in MODES 1, 2, 3, and 4. or	B.1 Restore control room boundary to OPERABLE status.	24 hours	TSTF-287 (5)

Rev. 0

INSERT 1

--NOTE--
The MCR/ESGR boundary may be opened intermittently under administrative control.

INSERT 2

C. Two or more required MCR/ESGR bottled air system trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	C.1 Restore at least two MCR/ESGR bottled air system train to OPERABLE status.	24 hours

MCR/ESGR Bottled Air System

CREFS 3.7.10 13

② ④

CTS

OR

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
NEW ~~C~~. (continued)	~~C~~.2.1 ~~Suspend CORE ALTERATIONS.~~	~~Immediately~~
	~~AND~~	
	~~C~~.~~2~~.~~[2]~~ 1 Suspend movement of recently irradiated fuel assemblies.	Immediately
NEW ~~D~~. E Two ~~CREFS~~ or more required MCR/ESGR bottled air system trains inoperable ~~[in MODE 5 or 6, or]~~ during movement of recently irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~.	~~D.1 Suspend CORE ALTERATIONS.~~	~~Immediately~~
	~~AND~~	
	~~D.[2] Suspend movement of irradiated fuel assemblies.~~	~~Immediately~~
E. Two CREFS trains inoperable in MODE 1, 2, 3, or 4.	E.1 Enter LCO 3.0.3.	Immediately

④ TSTF 287

TSTF 51

② ③ TSTF 51

See ITS 3.7.10

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.10.1 Operate each CREFS train for [≥ 10 continuous hours with the heaters operating or (for systems without heaters) ≥ 15 minutes].	31 days

See ITS 3.7.10

See ITS 3.7.11

(continued)

Rev. 0

MCR/ESGR Bottled Air System

CREFS ②
3.7.10
13 ④

CTS

SURVEILLANCE REQUIREMENTS (continued)

CTS	SURVEILLANCE		FREQUENCY	
	SR 3.7.10.2	Perform required CREFS filter testing in accordance with the [Ventilation Filter Testing Program (VFTP)].	In accordance with [VFTP]	See ITS 3.7.10 See ITS 3.7.14
		required MCR/ESGR bottled air system		④
4.7.7.1.d.2	SR 3.7.~~10~~.3 13	Verify each CREFS train actuates on an actual or simulated actuation signal.	[18] months 2	①
4.7.7.1.d.3	SR 3.7.~~10~~.4 13	Verify ~~one~~ two CREFS train can maintain a positive pressure of ≥ [0.125] 0.05 inches water gauge, relative to the adjacent [turbine building] areas during the pressurization mode of operation at a makeup flow rate of ≤ [3000] ≥ 340 cfm for at least 60 minutes.	[18] months on a STAGGERED TEST BASIS	④ ① ① ① ④ ⑤

4.7.7.2.a
4.7.7.2.b
INSERT ⑥

Rev.0

INSERT

SR 3.7.13.1	Verify each required MCR/ESGR bottled air bank is pressurized to ≥ 2300 psig.	31 days
SR 3.7.13.2	Verify each required MCR/ESGR bottled air bank manual valve not locked, sealed, or otherwise secured and required to be open during accident conditions is open.	31 days

1. The brackets are removed and the proper plant specific information/value is provided.

2. Changes are made (additions, deletions, and/or changes) to the ISTS to reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. The Applicability of MODES 5 and 6 is not adopted. The NAPS safety analysis does not identify any DBAs that initiate in these MODES, except a fuel handling accident. A fuel handling accident is addressed by the Applicability, "During movement of recently irradiated fuel assemblies," which is adopted. References to MODE 5 and 6 requirements in ISTS 3.7.13 Conditions C and D are also not adopted for consistency with the Applicability.

4. NAPS uses an MCR/ESGR bottled air system in conjunction with the MCR/ESGR emergency ventilation system to provide the breathable air to the MCR/ESGR envelope. The LCO is modified to require three MCR/ESGR bottled air system trains. The Bases explain that one bottled air bank provides air to each MCR/ESGR bottled air system train. Each train consists of one bottled air bank, piping, valves, and control systems that provide the air from the air bottles to the MCR/ESGR envelope. Condition A is modified to allow one MCR/ESGR bottled air system train to be inoperable for 7 days. The Condition for inoperable MCR/ESGR EVS trains due to an inoperable MCR/ESGR boundary is modified to also address the resulting inoperability of three required MCR/ESGR bottled air system trains. ISTS Conditions C and D, addressing the Applicability during movement of recently irradiated fuel assemblies, are modified. The first modification is for the Condition to address two or more required inoperable MCR/ESGR bottled air system trains. The second modification deletes the option of placing the OPERABLE ISTS CREFS train in emergency mode when one ISTS CREFS train is inoperable and is not restored to OPERABLE status within 7 days. The intent of this action is to put the portion of the system that can perform the safety function in service. The NAPS design places one train of MCR/ESGR EVS in recirculation when bottled air is actuated, and then places a second train in operation to provide filtered outside air after approximately 60 minutes. During the first 60 minutes, the MCR/ESGR bottled air system is in operation depleting the air in the bottled air system, and one train of MCR/ESGR is in recirculation. Thus, placing one train of the MCR/ESGR emergency ventilation system in recirculation and the MCR/ESGR bottled air system in operation when a train of either is inoperable impedes the capability to perform the safety function, rather than ensuring it, and this option is not adopted. ITS SR 3.7.13.3 and SR 3.7.13.4 are modified to address the bottled air system.

5. Editorial change made for enhanced clarity or to be consistent with the ISTS Writers Guide.

6. Two surveillances are added to address the requirement for two trains of bottled air to be OPERABLE. ITS SR 3.7.13.1 verifies every 31 days that each required MCR/ESGR bottled air bank is pressurized to $\geq$ 2300 psig. ITS SR 3.7.13.2 verifies every 31 days that each MCR/ESGR bottled air bank manual valve not locked, sealed, or otherwise secured

and required to be open during accident conditions is open. This is consistent with CTS and the safety analysis for the bottled air system, and ISTS for the MCR/ESGR EVS.

7. ISTS 3.7.13 Required Action C.1 is added to allow 24 hours to restore two of the three required MCR/ESGR EVS trains to OPERABLE status in MODE 1, 2, 3, or 4 when two or more required MCR/ESGR EVS trains are inoperable for reasons other than an inoperable MCR/ESGR boundary. The current Technical Specifications allow 7 days to restore an inoperable MCR/ESGR bottled air pressurization system to OPERABLE status. This is acceptable based on decreasing the current licensing basis allowance of 7 days to 24 hours, on taking appropriate compensatory measures during the time that two or more required MCR/ESGR EVS trains or two MCR/ESGR bottled air system trains are inoperable (consistent with TSTF-287), and the low probability of a DBA during this time period.

Main Control Room/Emergency Switchgear Room (MCR/ESGR)

MCR/ESGR EVS - During Movement of Recently Irradiated Fuel Assemblies

CREFS 3.7.~~10~~ 14

4

CTS

NEW

3.7 PLANT SYSTEMS

Ventilation

EVS

3.7.~~10~~ 14 ~~Control Room~~ Emergency ~~Filtration~~ System (~~CREFS~~) - During Movement of Recently Irradiated Fuel Assemblies

4

LCO 3.7.~~10~~ 14 Two ~~CREFS~~ MCR/ESGR EVS trains shall be OPERABLE.

INSERT

TSTF-287

APPLICABILITY: ~~MODES 1, 2, 3, 4, [5, and 6,]~~ During movement of recently irradiated fuel assemblies, ~~[During CORE ALTERATIONS]~~.

<See ITS 3.7.10> 3

TSTF-51

4

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required ~~CREFS~~ train inoperable.	A.1 Restore ~~CREFS~~ train to OPERABLE status.	7 days ~~INSERT~~
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours
B. ~~C.~~ Required Action and associated Completion Time of Condition A not met ~~[in MODE 5 or 6, or]~~ during movement of recently irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~.	~~C.1 -------NOTE------- Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable. ----------------~~ ~~Place OPERABLE CREFS train in emergency mode.~~ ~~OR~~	~~Immediately~~

5 TSTF-287

See ITS 3.7.10

9 1 3 5 TSTF-51 4

(continued)

Rev. 0

INSERT

---NOTE---

The MCR/ESGR boundary may be opened intermittently under administrative control.

MCR/ESGR EVS-During Movement of Recently Irradiated Fuel Assemblies ~~CREFS~~ 3.7.~~10~~ 14 (2) (4)

CTS

NEW

ACTIONS OR

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~C. (continued)~~	~~C.2.1 Suspend CORE ALTERATIONS.~~ ~~AND~~	~~Immediately~~ (4) TSTF-51
	(1) C.~~2.~~~~[2]~~ Suspend movement of recently irradiated fuel assemblies.	Immediately (2)
~~D~~. Two required MCR/ESGR EVS ~~CREFS~~ trains inoperable ~~[in MODE 5 or 6, or]~~ during movement of recently irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~.	~~D.1 Suspend CORE ALTERATIONS.~~ ~~AND~~ ~~D.[2] Suspend movement of irradiated fuel assemblies.~~	~~Immediately~~ ~~Immediately~~ (5) (3) TSTF-51
E. Two CREFS trains inoperable in MODE 1, 2, 3, or 4.	E.1 Enter LCO 3.0.3.	Immediately See ITS 3.7.10

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.~~10~~14.1 Operate each required MCR/ESGR EVS ~~CREFS~~ train for ~~[≥ 10 continuous hours with the heaters operating or (for systems without heaters)~~ ≥ 15 minutes~~]~~.	31 days (2) (4) (1)

(continued)

Rev.0

MCR/ESGR EVS - During Movement of Recently Irradiated Fuel Assemblies

CREFS 3.7.~~10~~ 14

CTS

NEW

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY	
SR 3.7.~~10~~.2 (14)	Perform required ~~CREFS~~ (MCR/ESGR EVS) filter testing in accordance with the [Ventilation Filter Testing Program (VFTP)].	In accordance with [VFTP]	2 4 1
SR 3.7.10.3	Verify each CREFS train actuates on an actual or simulated actuation signal.	[18] months	<See ITS 3.7.10> <See ITS 3.7.13>
SR 3.7.~~10~~.~~4~~ (14) (3)	Verify ~~one CREFS~~ (each required MCR/ESGR EVS) train ~~can~~ maintain a positive pressure of ≥ ~~[0.125]~~ (0.04) inches water gauge, relative to the adjacent ~~[turbine building]~~ (areas) during the pressurization mode of operation at a makeup flow rate of ~~≤ [3000]~~ (≥900 cfm and ≤1100 cfm) cfm.	[18] months on a STAGGERED TEST BASIS	2 4 1 1 1

Rev. 0

JUSTIFICATION FOR DEVIATIONS
ITS 3.7.14 - MCR/ESGR EVS - DURING MOVEMENT OF RECENTLY IRRADIATED FUEL ASSEMBLIES

1. The brackets are removed and the proper plant specific information/value is provided.

2. Changes are made (additions, deletions, and/or changes) to the ISTS to reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. The Applicability of MODES 5 and 6 is not adopted. The NAPS safety analysis does not identify any DBAs that initiate in these MODES, except a fuel handling accident. A fuel handling accident is addressed by the Applicability, "During movement of recently irradiated fuel assemblies," which is adopted. References to MODE 5 and 6 requirements in ISTS 3.7.10 Conditions C and D are also not adopted for consistency with the Applicability.

4. NAPS uses an MCR/ESGR bottled air system in conjunction with the MCR/ESGR emergency ventilation system to provide the habitable air to the MCR/ESGR envelope. ISTS Conditions C and D, addressing the Applicability during movement of recently irradiated fuel assemblies, are modified. The modification deletes the option of placing the OPERABLE ISTS CREFS train in emergency mode when one ISTS CREFS train is inoperable and is not restored to OPERABLE status within 7 days. The intent of this action is to put the portion of the system that can perform the safety function in service. The NAPS design places one train of MCR/ESGR EVS in recirculation when bottled air is actuated, and then places a second train in operation to provide filtered outside air after approximately 60 minutes. During the first 60 minutes, the MCR/ESGR bottled air system is in operation depleting the air in the bottled air system, and one train of MCR/ESGR is in recirculation. Thus, placing one train of the MCR/ESGR emergency ventilation system in recirculation and the MCR/ESGR bottled air system in operation when a train of either is inoperable impedes the capability to perform the safety function, rather than ensuring it, and this option is not adopted.

5. References to "during movement of recently irradiated fuel assemblies" in the ACTIONS and one Condition applicable in MODES 1, 2, 3, and 4 associated with TSTF-287 are deleted because the Applicability for ITS 3.7.14 is only during movement of recently irradiated fuel assemblies. Conditions addressing MODES 1, 2, 3, and 4 are addressed in ITS 3.7.10. Subsequent Conditions and Required Actions are renumbered accordingly.

CTS

FBVS FBACS 3.7.13 15 (1)

3.9.12

ACTION a

3.7 PLANT SYSTEMS Ventilation (1)

3.7.~~13~~ 15 Fuel Building ~~Air Cleanup~~ Ventilation System (FB~~AC~~VS)

LCO 3.7.~~13~~ 15 ~~Two FBACS trains~~ The FBVS shall be OPERABLE and in operation. (4) (1)

APPLICABILITY: ~~[MODES 1, 2, 3, and 4,]~~ (2) (4)
During movement of recently irradiated fuel assemblies in the fuel building. TSTF-51

ACTIONS

-------------------- NOTE --------------------
The fuel building boundary may be opened intermittently under administrative control. TSTF-287

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One FBACS train inoperable.	A.1	Restore FBACS train to OPERABLE status.	7 days
[B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, 3, or 4. OR Two FBACS trains inoperable in MODE 1, 2, 3, or 4.	B.1 AND B.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours]
C. Required Action and associated Completion Time [of Condition A] not met during movement of irradiated fuel assemblies in the fuel building.	C.1 OR C.2	Place OPERABLE FBACS train in operation. Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately Immediately

(4)

(continued)

Rev. 0

OR

FBVS not in operation

CTS

FBVS

FBVS

1 4

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
ACTION b A. ~~D.~~ ~~Two FBACS trains inoperable~~ during ~~movement of irradiated fuel assemblies in the fuel building.~~	A. ~~D.~~1 Suspend movement of recently irradiated fuel assemblies in the fuel building.	Immediately

4

TSTF-51

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
~~SR 3.7.13.1~~	~~Operate each FBACS train for [≥ 10 continuous hours with the heaters operating or (for systems without heaters) ≥ 15 minutes].~~	~~31 days~~
~~SR 3.7.13.2~~	~~Perform required FBACS filter testing in accordance with the [Ventilation Filter Testing Program (VFTP)].~~	~~In accordance with the [VFTP]~~
~~SR 3.7.13.3~~	~~Verify each FBACS train actuates on an actual or simulated actuation signal.~~	~~[18] months~~
4.9.12.b SR 3.7.~~13~~.~~4~~ 15 1	Verify ~~one FBACS train~~ The FBVS can maintain a pressure ≤ [-0.125] inches water gauge with ~~respect to atmospheric pressure during the [post accident] mode of operation at a flow rate ≤ [20,000] cfm.~~	[18] months ~~on a STAGGERED TEST BASIS~~

5

5 4 1 3 5

(continued)

Rev. 0

1

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
[SR 3.7.13.5	~~Verify each FBACS filter bypass damper can be closed.~~	[18] months]

5

Rev.0

1. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. This bracketed requirement/information is deleted because it is not applicable to North Anna. The following requirements are renumbered, where applicable, to reflect this deletion.

3. The brackets have been removed and the proper plant specific information/value has been provided.

4. The ISTS 3.7.13 LCO is modified to state that the FBVS is required to be OPERABLE, and must be in operation. The NAPS FBVS does not have an automatic start feature, and the FHA analysis assumes that at least one of the FBVS fans is operating at the time of the accident. The FHA analysis also does not assume single failure criteria apply to the FBVS. The Applicability is only during movement of recently irradiated fuel assemblies, not during MODES 1, 2, 3, and 4, as is allowed for by the ISTS in brackets. To accommodate these differences, ISTS 3.7.13 Conditions A, B, and C are not adopted, and Condition D is modified to address inoperability or non-operation of the FBVS. ISTS 3.7.13 Condition A addresses having one of two required FBVS trains inoperable, which does not apply. ISTS 3.7.13 Condition B addresses requirements in MODES 1, 2, 3, and 4, which do not apply. ISTS 3.7.13 Condition C addresses Condition A not being met, and reflects a system that has automatic actuation, which does not apply. ISTS 3.7.13 Condition D addresses two FBACS trains being inoperable during movement of irradiated fuel assemblies in the fuel building. This is modified to address the FBACS being inoperable or not being in operation, and deletes the reference to being applicable during movement of irradiated fuel assemblies in the fuel building, since that is the only Applicability retained. The Required Action for this Condition is consistent with ISTS 3.7.13 Condition D. ISTS 3.7.13.4 is modified to address an inoperable FBVS instead of one train being inoperable, consistent with the changes to the rest of the specification. These changes are consistent with the NAPS design, FHA analysis, and the current licensing basis.

5. The NAPS FHA analysis for the fuel building assumes that all of the radionuclides released from the fuel pool are released without credit for filtration of the released material. This makes the FBVS at NAPS different from the FBACS described in the ISTS because it is not required for the same function, and retaining the FBVS requirement for filtering contamination released as a result of a DBA in the Fuel Building is inappropriate. The ISTS has been changed to reflect the plant-specific design basis, deleting ISTS SR 3.7.13.1, ISTS SR 3.7.13.2, and ISTS SR 3.7.13.3, and deleting the ISTS 3.7.13.4 reference to post accident mode of operation and maximum flow rate because these requirements are related to including filters in the flow path.

CTS

3.7 PLANT SYSTEMS

3.7.16 Fuel Storage Pool Water Level (2)

3.9.11 LCO 3.7.16 The fuel storage pool water level shall be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks. (2)

APPLICABILITY: During movement of irradiated fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage pool water level not within limit.	A.1 --------NOTE-------- LCO 3.0.3 is not applicable. -------------------- Suspend movement of irradiated fuel assemblies in the fuel storage pool.	Immediately

Action

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool water level is ≥ 23 ft above the top of the irradiated fuel assemblies seated in the storage racks.	7 days (2)

4.9.11

Rev.0

3.7 PLANT SYSTEMS

3.7.16 Fuel Storage Pool Boron Concentration

LCO 3.7.16 The fuel storage pool boron concentration shall be $\geq$ [2300] ppm.

APPLICABILITY: When fuel assemblies are stored in the fuel storage pool and a fuel storage pool verification has not been performed since the last movement of fuel assemblies in the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Fuel storage pool boron concentration not within limit.	------------NOTE------------ LCO 3.0.3 is not applicable. -------------------------------	
	A.1 Suspend movement of fuel assemblies in the fuel storage pool.	Immediately
	AND	
	A.2.1 Initiate action to restore fuel storage pool boron concentration to within limit.	Immediately
	OR	
	A.2.2 Verify by administrative means [Region 2] fuel storage pool verification has been performed since the last movement of fuel assemblies in the fuel storage pool.	Immediately

(1)

Rev.0

(1)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify the fuel storage pool boron concentration is within limit.	7 days

Rev. 0

3.7 PLANT SYSTEMS

3.7.17 Spent Fuel Assembly Storage

LCO 3.7.17 The combination of initial enrichment and burnup of each spent fuel assembly stored in [Region 2] shall be within the Acceptable [Burnup Domain] of Figure 3.7.17-1 or in accordance with Specification 4.3.1.1.

APPLICABILITY: Whenever any fuel assembly is stored in [Region 2] of the spent fuel storage pool.

①

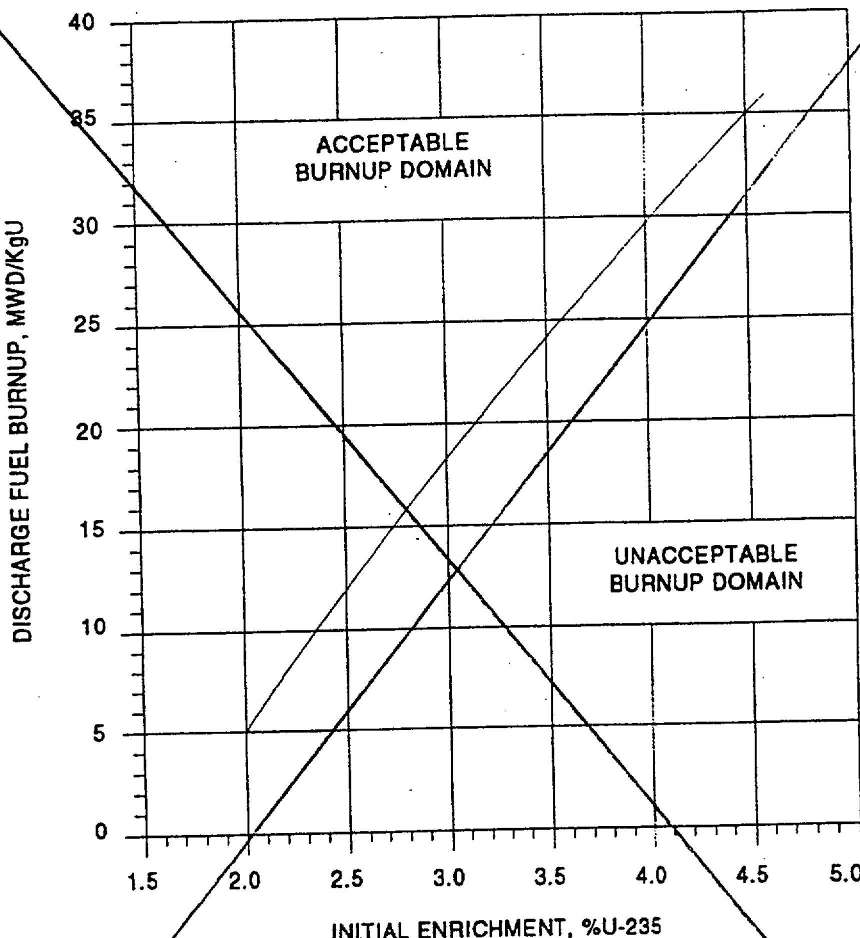
ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 ---------NOTE--------- LCO 3.0.3 is not applicable. -------------------- Initiate action to move the noncomplying fuel assembly from [Region 2].	 Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.17.1	Verify by administrative means the initial enrichment and burnup of the fuel assembly is in accordance with Figure 3.7.17-1 or Specification 4.3.1.1.	Prior to storing the fuel assembly in [Region 2]

Rev.0



Not to be used for Operation.
For illustration purposes only.

Figure 3.7.17-1 (page 1 of 1)
Fuel Assembly Burnup Limits in Region 2

①

Rev. 0

1. The North Anna CTS does not contain limits on fuel storage pool boron concentration or fuel storage pool region burnup because the North Anna spent fuel pool analyses do not credit boron or regional burnup limits. Therefore, the optional (e.g., bracketed) Specifications 3.7.16, Fuel Storage Pool Boron Concentration, and 3.7.17, Spent Fuel Assembly Storage, were not included in the North Anna ITS.

2. The North Anna ITS contains specifications that do not appear in the ISTS. ISTS Specification 3.7.15, Fuel Storage Pool Water Level, has been has been renumbered 3.7.16 in the North Anna ITS in order to accommodate those additional specifications.

SECTION 3.7 - PLANT SYSTEMS

IMPROVED STANDARD TECHNICAL SPECIFICATIONS BASES

MARKUP AND JUSTIFICATION FOR DEVIATIONS

B 3.7 PLANT SYSTEMS

B 3.7.1 Main Steam Safety Valves (MSSVs)

BASES

BACKGROUND

The primary purpose of the MSSVs is to provide overpressure protection for the secondary system. The MSSVs also provide protection against overpressurizing the reactor coolant pressure boundary (RCPB) by providing a heat sink for the removal of energy from the Reactor Coolant System (RCS) if the preferred heat sink, provided by the Condenser and Circulating Water System, is not available.

Five MSSVs are located on each main steam header, outside containment, upstream of the main steam isolation valves, as described in the FSAR, Section [10.3.1] (Ref. 1). The MSSVs ~~capacity criteria is 110% of rated steam flow at~~ 110% of the steam generator design pressure. ~~This~~ meets the requirements of the ASME Code, Section III (Ref. 2). The MSSV design includes staggered setpoints, according to Table 3.7.1-2 in the accompanying LCO, so that only the needed valves will actuate. Staggered setpoints reduce the potential for valve chattering that is due to steam pressure insufficient to fully open all valves following a turbine reactor trip.

u Must have sufficient capacity to limit the secondary system pressure to ≤

(in order to) ①② TSTF-235

or ⑤

APPLICABLE SAFETY ANALYSES

The design basis for the MSSVs comes from Reference 2 and its purpose is to limit the secondary system pressure to ≤ 110% of design pressure ~~when passing 100% of design steam flow. This design basis is sufficient to cope with~~ any anticipated operational occurrence (AOO) or accident considered in the Design Basis Accident (DBA) and transient analysis.

Capacity of the ① for TSTF-235

The events that challenge the relieving capacity of the MSSVs, and thus RCS pressure, are those characterized as decreased heat removal events, which are presented in the FSAR, Section [15.2] (Ref. 3). Of these, the full power turbine trip without steam dump is the limiting AOO. This event also terminates normal feedwater flow to the steam generators.

u ①② typically TSTF-235

The transient response for turbine trip without a direct reactor trip presents no hazard to the integrity of the RCS

Safety analysis demonstrates that the

occurring from full power TSTF-235

(continued)

Rev.0

BASES

APPLICABLE SAFETY ANALYSES (continued)

or the Main Steam System. ~~If a minimum reactivity feedback is assumed, the reactor is tripped on high pressurizer pressure. In this case, the pressurizer safety valves open, and RCS pressure remains below 110% of the design value. The MSSVs also open to limit the secondary steam pressure.~~

Insert

~~If maximum reactivity feedback is assumed, the reactor is tripped on overtemperature ΔT. The departure from nucleate boiling ratio increases throughout the transient, and never drops below its initial value. Pressurizer relief valves and MSSVs are activated and prevent overpressurization in the primary and secondary systems.~~ ~~The MSSVs are assumed to have two active and one passive failure modes. The active failure modes are spurious opening, and failure to reclose once opened. The passive failure mode is failure to open upon demand.~~

TSTF-235

①

The MSSVs satisfy Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii). ③

LCO

The accident analysis requires ~~four~~ five MSSVs per steam generator be operable to provide overpressure protection for design basis transients occurring at 102% RTP. ~~An MSSV will be considered inoperable if it fails to open on demand.~~ The LCO requires that five MSSVs per steam generator be OPERABLE in compliance with Reference 2, ~~even though this is not a requirement of~~ and the DBA analysis. ~~This is because operation with less than the full number of MSSVs requires limitations on allowable THERMAL POWER (to meet ASME Code requirements). These limitations are according to Table 3.7.1-1 in the accompanying LCO, and Required Action A.2.~~

TSTF-235

The OPERABILITY of the MSSVs is defined to as the ability to open upon demand within the setpoint tolerances, to relieve steam generator overpressure, and reseat when pressure has been reduced. The OPERABILITY of the MSSVs is determined by periodic surveillance testing in accordance with the Inservice Testing Program.

Move to page B 3.7-5

The lift settings, according to Table 3.7.1-2 ~~in the accompanying LCO~~, correspond to ambient conditions of the valve at nominal operating temperature and pressure.

(continued)

Rev. 0

INSERT

One turbine trip analysis is performed assuming primary system pressure control via operation of the pressurizer relief valves and spray. This analysis demonstrates that the DNB design basis is met. Another analysis is performed assuming no primary system pressure control, but crediting reactor trip on high pressurizer pressure and operation of the pressurizer safety valves. This analysis demonstrates that RCS integrity is maintained by showing that the maximum RCS pressure does not exceed 110% of the design pressure. All cases analyzed demonstrate that the MSSVs maintain Main Steam System integrity by limiting the maximum steam pressure to less than 110% of the steam generator design pressure.

In addition to the decreased heat removal events, reactivity insertion events may also challenge the relieving capacity of the MSSVs. The uncontrolled rod cluster control assembly (RCCA) bank withdrawal at power event is characterized by an increase in core power and steam generation rate until reactor trip occurs when either the Overtemperature ΔT or Power Range Neutron Flux-High setpoint is reached. Steam flow to the turbine will not increase from its initial value for this event. The increased heat transfer to the secondary side causes an increase in steam pressure and may result in opening of the MSSVs prior to reactor trip, assuming no credit for operation of the atmospheric or condenser steam dump valves. The UFSAR Section 15.2 safety analysis of the RCCA bank withdrawal at power event for a range of initial core power levels demonstrates that the MSSVs are capable of preventing secondary side overpressurization for this AOO. The UFSAR safety analyses discussed above assume that all of the MSSVs for each steam generator are OPERABLE. If there are inoperable MSSV(s), it is necessary to limit the primary system power during steady-state operation and AOOs to a value that does not result in exceeding the combined steam flow capacity of the turbine (if available) and the remaining OPERABLE MSSVs. The required limitation on primary system power necessary to prevent secondary system overpressurization may be determined by system transient analyses or conservatively arrived at by a simple heat balance calculation. In some circumstances it is necessary to limit the primary side heat generation that can be achieved during an AOO by reducing the setpoint of the Power Range Neutron Flux-High reactor trip function. For example, if more than one MSSV on a single steam generator is inoperable, an uncontrolled RCCA bank withdrawal at power event occurring from a partial power level may result in an increase in reactor power that exceeds the combined steam flow capacity of the turbine and the remaining OPERABLE MSSVs. Thus, for multiple inoperable MSSVs on the same steam generator it is necessary to prevent this power increase by lowering the Power Range Neutron Flux-High setpoint to an appropriate value. When the Moderator Temperature Coefficient (MTC) is positive, the reactor power may increase above the initial value during an RCS heatup event (e.g., turbine trip). Thus, for any number of inoperable MSSVs it is necessary to reduce the trip setpoint if a positive MTC may exist at partial power conditions.

BASES

LCO (continued)

This LCO provides assurance that the MSSVs will perform their designed safety functions to mitigate the consequences of accidents that could result in a challenge to the RCPB. or Main Steam System integrity TSTF-235

APPLICABILITY

In ~~MODE 1 above 40% RTP, the number of MSSVs per steam generator required to be OPERABLE must be according to Table 3.7.1-1 in the accompanying LCO. Below 40% RTP in~~ MODES 1, 2, and 3, ~~only two~~ five MSSVs per steam generator are required to be OPERABLE to prevent Main Steam System overpressurization. TSTF-235

In MODES 4 and 5, there are no credible transients requiring the MSSVs. The steam generators are not normally used for heat removal in MODES 5 and 6, and thus cannot be overpressurized; there is no requirement for the MSSVs to be OPERABLE in these MODES.

ACTIONS

The ACTIONS table is modified by a Note indicating that separate Condition entry is allowed for each MSSV.

A.1

With one or more MSSVs inoperable, action must be taken ~~reduce power~~ so that the available MSSV relieving capacity meets Reference 2 requirements ~~for the applicable THERMAL POWER~~. TSTF-235

Operation with less than all five MSSVs OPERABLE for each steam generator is permissible, if THERMAL POWER is ~~proportionally~~ limited to the relief capacity of the remaining MSSVs. This is accomplished by restricting THERMAL POWER so that the energy transfer to the most limiting steam generator is not greater than the available relief capacity in that steam generator. Insert ~~For example, if one MSSV is inoperable in one steam generator, the relief capacity of that steam generator is reduced by approximately 20%. To offset this reduction in relief capacity, energy transfer to that steam generator must be similarly reduced by at least 20%. This is accomplished by reducing THERMAL POWER by at least 20%, which conservatively limits the energy transfer to all steam generators to approximately 80% of total capacity, consistent with the relief capacity of the most limiting steam generator.~~ TSTF-235

(continued)

Rev.0

INSERT

A.1

In the case of only a single inoperable MSSV on one or more steam generators, when the Moderator Temperature Coefficient is not positive, a reactor power reduction alone is sufficient to limit primary side heat generation such that overpressurization of the secondary side is precluded for any RCS heatup event. Furthermore, for this case there is sufficient total steam flow capacity provided by the turbine and remaining OPERABLE MSSVs to preclude overpressurization in the event of an increased reactor power due to reactivity insertion, such as in the event of an uncontrolled RCCA bank withdrawal at power. Therefore, Required Action A.1 requires an appropriate reduction in reactor power within 4 hours.

The maximum THERMAL POWER corresponding to the heat removal capacity of the remaining OPERABLE MSSVs is determined via a conservative heat balance calculation as described in the attachment to Reference 6, with an appropriate allowance for calorimetric power uncertainty.

B.1 and B.2

In the case of multiple inoperable MSSVs on one or more steam generators, with a reactor power reduction alone there may be insufficient total steam flow capacity provided by the turbine and remaining OPERABLE MSSVs to preclude overpressurization in the event of an increased reactor power due to reactivity insertion, such as in the event of an uncontrolled RCCA bank withdrawal at power. Furthermore, for a single inoperable MSSV on one or more steam generators when the Moderator Temperature Coefficient is positive the reactor power may increase as a result of an RCS heatup event such that flow capacity of the remaining OPERABLE MSSVs is insufficient. The 4 hour Completion Time for Required Action B.1 is consistent with A.1. An additional 32 hours is allowed in Required Action B.2 to reduce the setpoints. The Completion Time of 36 hours is based on a reasonable time to correct the MSSV inoperability, the time required to perform the power reduction, operating experience in resetting all channels of a protective function, and on the low probability of the occurrence of a transient that could result in steam generator overpressure during this period.

The maximum THERMAL POWER corresponding to the heat removal capacity of the remaining OPERABLE MSSVs is determined via a conservative heat balance calculation as described in the attachment to Reference 6, with an appropriate allowance for Nuclear Instrumentation System trip channel uncertainties.

Required Action B.2 is modified by a Note, indicating that the Power Range Neutron Flux-High reactor trip setpoint reduction is only required in MODE 1. In MODES 2 and 3 the reactor protection system trips specified in LCO 3.3.1, “Reactor Protection System Instrumentation,” provide sufficient protection.

The allowed Completion Times are reasonable based on operating experience to accomplish the Required Actions in an orderly manner without challenging unit systems.

BASES

ACTIONS

A.1 (continued)

For each steam generator, at a specified pressure, the fractional relief capacity (FRC) of each MSSV is determined as follows:

$$FRC = \frac{A}{B}$$

where:

A = the relief capacity of the MSSV; and

B = the total relief capacity of all the MSSVs of the steam generator.

The FRC is the relief capacity necessary to address operation with reduced THERMAL POWER.

The reduced THERMAL POWER levels in the LCO prevent operation at power levels greater than the relief capacity of the remaining MSSVs. The reduced THERMAL POWER is determined as follows:

TSTF-235

$$RP = \left[1 - (N_1 \times FRC_1 + N_2 \times FRC_2 + \cdots + N_5 \times FRC_5)\right] \times 100\%$$

where:

RP = Reduced THERMAL POWER for the most limiting steam generator expressed as a percent of RTP;

N_1, N_2, ..., N_5 represent the status of the MSSV 1, 2, ..., 5, respectively.

= 0 if the MSSV is OPERABLE,
= 1 if the MSSV is inoperable;

FRC_1, FRC_2, ..., FRC_5 = the relief capacity of the MSSV 1, 2, ..., 5, respectively, as defined above.

(continued)

Rev. 0

BASES

ACTIONS (continued)

C.1 and C.2

Required Actions are not completed

If the ~~MSSVs cannot be restored to OPERABLE status~~ within the associated Completion Time, or if one or more steam generators have ~~less than two~~ ≥4 inoperable MSSVs ~~OPERABLE~~, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within 12 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.

TSTF-235

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

This SR verifies the OPERABILITY of the MSSVs by the verification of each MSSV lift setpoint in accordance with the Inservice Testing Program. The ASME Code, Section XI (Ref. 4), requires that safety and relief valve tests be performed in accordance with ANSI/ASME OM-1-1987 (Ref. 5). According to Reference 5, the following tests are required:

a. Visual examination;

b. Seat tightness determination;

c. Setpoint pressure determination (lift setting);

d. Compliance with owner's seat tightness criteria; and

e. Verification of the balancing device integrity on balanced valves.

The ANSI/ASME Standard requires that all valves be tested every 5 years, and a minimum of 20% of the valves be tested every 24 months. The ASME Code specifies the activities and frequencies necessary to satisfy the requirements. Table 3.7.1-2 allows a ± ~~[3]~~% setpoint tolerance for OPERABILITY; however, the valves are reset to ± 1% during the Surveillance to allow for drift. (2)

Insert paragraph from Page B 3.7-2

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. The MSSVs may be either bench tested or tested in situ at hot

(continued)

Rev.0

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1 (continued)

conditions using an assist device to simulate lift pressure. If the MSSVs are not tested at hot conditions, the lift setting pressure shall be corrected to ambient conditions of the valve at operating temperature and pressure.

REFERENCES

1. U FSAR, Section ~~[10.3.1]~~. ① ②
2. ASME, Boiler and Pressure Vessel Code, Section III, ~~Article NC-7000, Class 2 Components~~. 1968 Edition with Addenda through Winter 1970 ①
3. U FSAR, Section ~~[15.2]~~. ① ②
4. ASME, Boiler and Pressure Vessel Code, Section XI.
5. ANSI/ASME OM-1-1987.
6. NRC Information Notice 94-60, "Potential Overpressurization of the Main Steam System," August 22, 1994. TSTF-235

Rev.0

JUSTIFICATION FOR DEVIATIONS
ITS 3.7.1 BASES, MAIN STEAM SAFETY VALVES

1. Changes are made (additions, deletions, and/or changes) to the ISTS, which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The brackets have been removed and the proper plant specific information/value has been provided.

3. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

4. Changes are made to reflect changes made to the specifications.

5. Editorial change made for enhanced clarity or to be consistent with the ISTS Writers Guide.

B 3.7 PLANT SYSTEMS Trip

B 3.7.2 Main Steam Isolation Valves (MSIVs) (MSTVs)

BASES

MSTVs

BACKGROUND

The MSIVs isolate steam flow from the secondary side of the steam generators following a high energy line break (HELB). MSTV MSIV closure terminates flow from the unaffected (intact) steam generators.

MSTVs

One MSIV is located in each main steam line outside, but close to, containment. The MSIVs are downstream from the main steam safety valves (MSSVs) and auxiliary feedwater (AFW) pump turbine steam supply, to prevent MSSV and AFW isolation from the steam generators by MSIV closure. MSTV Closing the MSIVs isolates each steam generator from the others, and isolates the turbine, Steam Bypass System, and other auxiliary steam supplies from the steam generators. MSTVs Dump

intermediate high

The MSIVs close on a main steam isolation signal generated by either ~~low steam generator pressure or~~ high containment pressure. or high steam flow coincident with low low RCS Tavg. or low steam line pressure The MSIVs fail closed on loss of control ~~or actuation power~~. MSTVs air pressure

MSTV

Each MSIV has an MSIV bypass valve. Although these bypass valves are normally closed, they receive the same emergency closure signal as do their associated MSIVs. The MSIVs may also be actuated manually. MSTVs MSTV bypass valves

u

A description of the MSIVs is found in the FSAR, Section [10.3] (Ref. 1).

(1) (2)

MSTVs main M

APPLICABLE SAFETY ANALYSES

The design basis of the MSIVs is established by the containment analysis for the large steam line break (SLB) inside containment, discussed in the FSAR, Section [6.2] (Ref. 2). It is also affected by the accident analysis of the SLB events presented in the FSAR, Section [15.1.5] (Ref. 3). The design precludes the blowdown of more than one steam generator, assuming a single active component failure (e.g., the failure of one MSIV to close on demand). u 15.4.2 (2) (2)

MSTV M

The limiting case for the containment analysis is the SLB inside containment, with a loss of offsite power following turbine trip, and failure of the MSIV on the affected steam

Non Return Valve (NRV)

(1)

(continued)

Rev.0

MSTVs

MSIVs

APPLICABLE SAFETY ANALYSES (continued)

generator to close. At lower powers, the steam generator inventory and temperature are at their maximum, maximizing the analyzed mass and energy release to the containment. NRV Due to reverse flow and failure of the MSIV to close, the additional mass and energy in the steam headers downstream from the other MSIV contribute to the total release. MSTV With the most reactive rod cluster control assembly assumed stuck in the fully withdrawn position, there is an increased possibility that the core will become critical and return to power. The core is ultimately shut down by the boric acid injection delivered by the Emergency Core Cooling System.

The accident analysis compares several different SLB events against different acceptance criteria. M The ~~large~~ SLB outside containment upstream of the MSIV is limiting for MSTV offsite dose, although a break in this short section of main steam header has a very low probability. The ~~large~~ SLB inside containment at hot zero power is the limiting case for a post trip return to power. The analysis includes scenarios with offsite power available, and with a loss of offsite power following turbine trip. With offsite power available, the reactor coolant pumps continue to circulate coolant through the steam generators, maximizing the Reactor Coolant System cooldown. With a loss of offsite power, the response of mitigating systems is delayed. Significant single failures considered include failure of an MSIV to close. MSTV

MSTVs

The MSIVs serve only a safety function and remain open during power operation. These valves operate under the following situations:

a. A~~n~~ HELB inside containment. In order to maximize the mass and energy release into containment, the analysis assumes that the MSIV in the affected steam generator remains open. For this accident scenario, steam is discharged into containment from all steam generators until the remaining MSIVs close. After MSIV closure, steam is discharged into containment only from the affected steam generator and from the residual steam in the main steam header downstream of the closed MSIVs in the unaffected loops. Closure of the MSIVs isolates the break from the unaffected steam generators.

NRV MSTVs MSTV MSTVs

①

(continued)

Rev.0

BASES

APPLICABLE SAFETY ANALYSES (continued)

b. A break outside of containment and upstream from the MSIVs is not a containment pressurization concern. MSTV The uncontrolled blowdown of more than one steam generator must be prevented to limit the potential for uncontrolled RCS cooldown and positive reactivity addition. Closure of the MSIVs isolates the break and limits the blowdown to a single steam generator. MSTVs (1) (1)

c. A break downstream of the MSIVs will be isolated by the closure of the MSIVs. MSTVs (1)

d. Following a steam generator tube rupture, closure of the MSIVs isolates the ruptured steam generator from the intact steam generators to minimize radiological releases. MSTVs

e. The MSIVs are also utilized during other events such as a feedwater line break. This event is less limiting so far as MSIV OPERABILITY is concerned. MSTV (1)

MSTVs The MSIVs satisfy Criterion 3 of ~~the NRC Policy Statement~~. 10 CFR 50.36 (c)(2)(ii) (3)

LCO

This LCO requires that ~~[four]~~ Three MSIVs MSTVs in the steam lines be OPERABLE. The MSIVs MSTVs are considered OPERABLE when the isolation times are within limits, and they close on an isolation actuation signal. (2) (1) (1)

This LCO provides assurance that the MSIVs MSTVs will perform their design safety function to mitigate the consequences of accidents that could result in offsite exposures comparable to the 10 CFR 100 (Ref. 4) limits or the NRC staff approved licensing basis. (1)

APPLICABILITY

The MSIVs MSTVs must be OPERABLE in MODE 1, and in MODES 2 and 3 except when closed and de-activated, when there is significant mass and energy in the RCS and steam generators. When the MSIVs MSTVs are closed, they are already performing the safety function. (1) (1)

In MODE 4, ~~normally most of the MSIVs are closed, and~~ the steam generator energy is low and the MSTVs are not required to support the safety analyses due to the low probability of a design basis accident. (1)

(continued)

Rev. 0

BASES

APPLICABILITY (continued)

In MODE 5 or 6, the steam generators do not contain much energy because their temperature is below the boiling point of water; therefore, the MSIVs MSTVs are not required for isolation of potential high energy secondary system pipe breaks in these MODES.

ACTIONS

A.1

With one MSIV MSTV inoperable in MODE 1, action must be taken to restore OPERABLE status within ~~[8]~~ 2 hours. Some repairs to the MSIV can be made with the unit hot. The ~~[8]~~ 2 hour Completion Time is reasonable, considering the low probability of an accident occurring during this time period that would require a closure of the MSIVs MSTVs.

The ~~[8]~~ 2 hour Completion Time is greater than that normally allowed for containment isolation valves because the MSIVs MSTVs are valves that isolate a closed system penetrating containment. These valves differ from other containment isolation valves in that the closed system provides an additional means for containment isolation.

B.1

If the MSIV MSTV cannot be restored to OPERABLE status within ~~[8]~~ 2 hours, 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 MODE 2 within 6 hours and Condition C would be entered. The Completion Times are reasonable, based on operating experience, to reach MODE 2 and to close the MSIVs MSTVs in an orderly manner and without challenging unit systems.

C.1 and C.2

Condition C is modified by a Note indicating that separate Condition entry is allowed for each MSIV MSTV.

Since the MSIVs MSTVs are required to be OPERABLE in MODES 2 and 3, the inoperable MSIVs MSTVs may either be restored to OPERABLE status or closed. When closed, the MSIVs MSTVs are already in the position required by the assumptions in the safety analysis.

(continued)

Rev. 0

 1

BASES

ACTIONS

C.1 and C.2 (continued)

The [8] hour Completion Time is consistent with that allowed in Condition A. 2

MSTVs

For inoperable MSIVs that cannot be restored to OPERABLE status within the specified Completion Time, but are closed, the inoperable MSIVs must be verified on a periodic basis to be closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of MSIV status indications available in the control room, and other administrative controls, to ensure that these valves are in the closed position. 1

MSTVs

MSTV

D.1 and D.2 MSTVs 1

If the MSIVs cannot be restored to OPERABLE status or are not closed within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed at least in MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from MODE 2 conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1 MSTV isolation 5.0 1 2

This SR verifies that MSIV closure time is ≤ [4.6] seconds ~~on an actual or simulated actuation signal~~. The MSIV MSTV TSTF-289

isolation

closure time is assumed in the accident and containment analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. The MSIVs should not be tested at power, since even a part stroke exercise increases the risk of a valve closure when the unit is generating power. As the MSIVs are not tested at power, they are exempt from the ASME Code, Section XI (Ref. 5), requirements during operation in MODE 1 or 2. 1 MSTVs 1

MSTVs

(continued)

Rev. 0

MSTVs

MSIVs

B 3.7.2 ①

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1 (continued)

The Frequency is in accordance with the [Inservice Testing Program or [18] months]. The [18] month Frequency for valve closure time is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

TSTF-289 ①

may be

This test is conducted in MODE 3 with the unit at operating temperature and pressure, as discussed in Reference 5 exercising requirements. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated.

Insert

REFERENCES

1. UFSAR, Section [10.3]. ① ②
2. UFSAR, Section [6.2]. ① ②
3. UFSAR, Section [15.1.5] 15.4.2 ① ②
4. 10 CFR 100.11.
5. ASME, Boiler and Pressure Vessel Code, Section XI.

Rev.0

INSERT

SR 3.7.2.2

This SR verifies that each MSTV closes on an actual or simulated actuation signal. This Surveillance is normally performed upon returning the plant to operation following a refueling outage. The Frequency of MSTV testing is every 18 months. The 18 month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.

1. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The brackets have been removed and the proper plant specific information/value has been provided.

3. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

B 3.7 PLANT SYSTEMS

Main Feedwater Pump Discharge Valves (MFPDVs),

B 3.7.3 Main Feedwater Isolation Valves (MFIVs) ~~and~~ Main Feedwater Regulation Valves (MFRVs) ~~and~~ ~~[Associated Bypass Valves]~~ (1)

ng

Main Feedwater Regulating Bypass Valves (MFRBVs)

BASES

BACKGROUND

~~The MFIVs isolate main feedwater (MFW) flow to the secondary side of the steam generators following a high energy line break (HELB). The safety related function of the MFRVs is to provide the second isolation of MFW flow to the secondary side of the steam generators following an HELB. Closure of the MFIVs and associated bypass valves or MFRVs and associated bypass valves terminates flow to the steam generators, terminating the event for feedwater line breaks (FWLBs) occurring upstream of the MFIVs or MFRVs. The consequences of events occurring in the main steam lines or in the MFW lines downstream from the MFIVs will be mitigated by their closure. Closure of the MFIVs and associated bypass valves, or MFRVs and associated bypass valves, effectively terminates the addition of feedwater to an affected steam generator, limiting the mass and energy release for steam line breaks (SLBs) or FWLBs inside containment, and reducing the cooldown effects for SLBs.~~

Insert

~~The MFIVs and associated bypass valves, or MFRVs and associated bypass valves, isolate the nonsafety related portions from the safety related portions of the system. In the event of a secondary side pipe rupture inside containment, the valves limit the quantity of high energy fluid that enters containment through the break, and provide a pressure boundary for the controlled addition of auxiliary feedwater (AFW) to the intact loops.~~ (1)

~~One MFIV and associated bypass valve, and one MFRV and its associated bypass valve, are located on each MFW line, outside but close to containment. The MFIVs and MFRVs are located upstream of the AFW injection point so that AFW may be supplied to the steam generators following MFIV or MFRV closure. The piping volume from these valves to the steam generators must be accounted for in calculating mass and energy releases, and refilled prior to AFW reaching the steam generator following either an SLB or FWLB.~~

~~The MFIVs and associated bypass valves, and MFRVs and associated bypass valves, close on receipt of a T_{avg} – Low coincident with reactor trip (P-4) or steam generator water~~

(continued)

Rev.0

INSERT

The MFIV and the MFRV are in series in the Main Feedwater (MFW) line upstream of each steam generator. The MFRBV is parallel to both the MFIV and the MFRV. The MFPDV is located at the discharge of each main feedwater pump. The valves are located outside of the containment. These valves provide the isolation of each MFW line by the closure of the MFIV and MFRBV, the MFRV and MFRBV, or the closure of the MFPDV. To provide the needed isolation given the single failure of one of the valves, all four valve types are required to be OPERABLE.

The safety-related function of the MFIVs, MFPDVs, MFRVs and the MFRBVs is to provide isolation of MFW from the secondary side of the steam generators following a high energy line break. Closure of the MFIV and MFRBV, the MFRV and MFRBV, or the closure of the MFPDV terminates the addition of feedwater to an affected steam generator, limiting the mass and energy release for steam or feedwater line breaks and minimizing the positive reactivity effects of the Reactor Coolant System (RCS) cooldown associated with the blowdown. In the event of pipe rupture inside the containment, the valves limit the quantity of high energy fluid that enters the containment through the broken loop.

The containment isolation MFW check valve in each loop provides the first pressure boundary for the addition of Auxiliary Feedwater (AFW) to the intact loops and prevents back flow in the feedwater line should a break occur upstream of these valves. These check valves also isolate the non-safety-related portion of the MFW system from the safety-related portion of the system. The piping volume from the feedwater isolation valve to the steam generators is considered in calculating mass and energy release following either a steam or feedwater line break.

The MFIVs, MFPDVs, MFRVs, and MFRBVs close on receipt of Safety Injection or Steam Generator Water Level – High – High signal. The MFIVs, MFPDVs, MFRVs, and MFRBVs may also be actuated manually.

A description of the operation of the MFIVs, MFPDVs, MFRVs, and MFRBVs is found in Section 10.4.3 of the UFSAR (Ref. 1).

BASES

BACKGROUND (continued)

~~level-high high signal. They may also be actuated manually. In addition to the MFIVs and associated bypass valves, and the MFRVs and associated bypass valves, a check valve inside containment is available. The check valve isolates the feedwater line, penetrating containment, and ensures that the consequences of events do not exceed the capacity of the containment heat removal systems.~~ (1)

~~A description of the MFIVs and MFRVs is found in the FSAR, Section [10.4.7] (Ref. 1).~~

APPLICABLE SAFETY ANALYSES

The design basis for the closure of the MFIVs ~~and~~ , MFPDVs, MFRVs and MFRBVs is established by ~~the analyses for the large SLB~~ Main Steam Line Break (MSLB). It is also influenced by the accident analysis for the ~~large~~ FWLB Feed Water Line Break (). Closure of the MFIVs and ~~associated bypass valves~~ or the MFPDVs, or MFRVs and MFRBVs ~~associated bypass valves~~, may also be relied on to terminate an SLB for core response analysis and for an excess feedwater event upon the receipt of a steam generator water level-high high signal. On reciept of an SI signal ~~or a feedwater isolation signal on high steam generator level~~. (M) (1)

Failure of an MFIV and MFRV, or ~~the associated bypass valves~~ an MFRBV and MFPDV to close following an SLB or FWLB can result in additional mass and energy being delivered to the steam generators, contributing to cooldown. This failure also results in additional mass and energy releases following an SLB or FWLB event. (M)

The MFIVs ~~and~~ , MFPDVs, MFRVs, and MFRBVs satisfy Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii). (2)

LCO

This LCO ensures that the MFIVs, MFPDVs, MFRVs, and ~~their associated bypass valves~~ MFRBVs will isolate MFW flow to the steam generators, following an FWLB or main steam line break. ~~These valves will also isolate the nonsafety related portions from the safety related portions of the system.~~

This LCO requires that ~~[four] MFIVs and associated bypass valves and [four] MFRVs [and associated bypass valves]~~ three MFIVs, three MFPDVs, three MFRVs, and three MFRBVs be OPERABLE. The ~~MFIVs and MFRVs and the associated bypass~~ valves are considered OPERABLE when isolation times are

(continued)

Rev. 0

BASES

LCO (continued)

within limits and they close on an isolation actuation signal.

Failure to meet the LCO requirements can result in additional mass and energy being released to containment following an M SLB or FWLB inside containment. [If] a feedwater isolation signal on high- high steam generator level is relied on to terminate an excess feedwater flow event, and failure to meet the LCO may result in the introduction of water into the main steam lines. ①

APPLICABILITY

The MFIVs , MFPOVs, and MFRVs ~~and the associated bypass valves~~ , and MFRBVs must be OPERABLE whenever there is significant mass and energy in the Reactor Coolant System and steam generators. ~~This ensures that, in the event of an HELB, a single failure cannot result in the blowdown of more than one steam generator.~~ In MODES 1, 2, [and 3], the MFIVs, MFPOVs, MFRVs and ~~the associated bypass valves~~ MFRBVs are required to be OPERABLE to limit the amount of available fluid that could be added to containment in the case of a secondary system pipe break inside containment. When the valves are closed and de-activated or isolated by a closed manual valve, they are already performing their safety function. ① ④ ③

In MODES 4, 5, and 6, ~~steam generator energy is low. Therefore,~~ the MFIVs, MFPOVs, MFRVs, and ~~the associated bypass valves~~ MFRBVs are ~~normally closed since MFW is~~ not required to be OPERABLE. ①

ACTIONS

The ACTIONS table is modified by a Note indicating that separate Condition entry is allowed for each valve.

A.1 and A.2

With one MFIV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable affected valves within [72] hours. When these valves are closed or isolated, they are performing their required safety function. ③

(continued)

Rev. 0

BASES

ACTIONS

A.1 and A.2 (continued)

The ~~[72]~~ hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The ~~[72]~~ hour Completion Time is reasonable, based on operating experience. 3

Inoperable MFIVs that are closed or isolated must be verified, by direct or administrative means, on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of ~~valve status indications available in the control room and~~ other administrative controls, to ensure that these valves are closed or isolated. 5

B.1 and B.2

With one MFRV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable affected valves within ~~[72]~~ hours. When these valves are closed or isolated, they are performing their required safety function. 3

The ~~[72]~~ hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The ~~[72]~~ hour Completion Time is reasonable, based on operating experience. 3

Inoperable MFRVs, that are closed or isolated, must be verified, by direct or administrative means, on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of ~~valve status indications available in the control room and~~ other administrative controls to ensure that the valves are closed or isolated. 5

(continued)

Rev. 0

BASES

ACTIONS (continued)

C.1 and C.2

MFRBV

With one ~~associated bypass valve~~ in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable affected valves within ~~[~~72~~]~~ hours. When these valves are closed or isolated, they are performing their required safety function. (1) (3)

The ~~[~~72~~]~~ hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The ~~[~~72~~]~~ hour Completion Time is reasonable, based on operating experience. (3) (3)

MFRBVs

Inoperable ~~associated bypass valves~~ that are closed or isolated must be verified on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of ~~valve status indications available in the control room, and~~ other administrative controls~~,~~ to ensure that these valves are closed or isolated. (1) (5) (5)

, by direct or administrative means,

Insert

(E) ~~D~~.1 (1)

With two inoperable valves in the same flow path, there may be no redundant system to operate automatically and perform the required safety function. ~~Although the containment can be isolated with the failure of two valves in parallel in the same flow path, the double failure can be an indication of a common mode failure in the valves of this flow path, and as such, is treated the same as a loss of the isolation capability of this flow path. Under these conditions,~~ the affected valves ~~in each flow path~~ must be restored to OPERABLE status, or the affected flow path isolated within 8 hours. This action returns the system to the condition where at least one valve in each flow path is performing the required safety function. The 8 hour Completion Time is reasonable, based on operating experience, to complete the actions required to close the ~~MFIV or MFRV~~, or otherwise isolate the affected flow path. (1) (1)

affected valves

(continued)

Rev. 0

INSERT

D.1 and D.2

With one MFPDV in one or more flow paths inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable affected valves within 72 hours. When these valves are closed or isolated, they are performing their required safety function.

The 72 hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The 72 hour Completion Time is reasonable, based on operating experience.

Inoperable MFPDVs that are closed or isolated must be verified, by direct or administrative means, on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, and in view of other administrative controls, to ensure that these valves are closed or isolated.

BASES

ACTIONS (continued)

F F
F.1 and F.2 — ~~E.1 and E.2~~ ①

inoperable

If the ~~MFIV(s) and MFRV(s) and the associated bypass~~ valve(s) cannot be restored to OPERABLE status, or closed, or isolated within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, ~~[and~~ in MODE 4 within 12 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. ① ③

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1

isolation 6.98

This SR verifies that the ~~closure~~ time of each MFIV, MFRV, and ~~associated bypass valves~~ MFRBV is ≤ ~~7~~ seconds ~~on an actual or simulated actuation signal~~ and the isolation time for each MFPDV is ≤ 60 seconds. The ~~MFIV and MFRV closure~~ isolation times are assumed in the accident and containment analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage. ~~These valves should not be tested at power since even a part stroke exercise increases the risk of a valve closure with the unit generating power. This is consistent with the ASME Code, Section XI (Ref. 2), quarterly stroke requirements during operation in MODES 1 and 2.~~ ① TSTF-289

The Frequency for this SR is in accordance with the ~~[~~Inservice Testing Program ~~or [18] months]~~. ~~The [18] month Frequency for valve closure is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency.~~ TSTF-289

Insert

TSTF-289

REFERENCES

1. ~~[~~FSAR, Section ~~[~~10.4.7~~]~~. ① ②

~~2. ASME, Boiler and Pressure Vessel Code, Section XI.~~ ①

Rev.0

INSERT

SR 3.7.3.2

This SR verifies that each MFIV, MFRV, MFRBV and MFPDV can close on an actual or simulated actuation signal. This Surveillance is normally performed during a refueling outage.

The Frequency for this SR is every 18 months. The 18 month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.

1. Changes are made (additions, deletions, and/or changes) to the ISTS, which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

3. The brackets are removed and the proper plant specific information/value is provided.

4. The wording is being deleted because it is not applicable to NAPS. The NAPS design is such that the Feedwater check valves prevent blowdown of more than one steam generator.

5. Changes have been made to the Bases to be consistent with changes made to the Specifications.

①

B 3.7 PLANT SYSTEMS

B 3.7.4 Atmospheric Dump Valves (ADVs) STEAM GENERATOR POWER OPERATED RELIEF VALVES (SGPORVs) ①

BASES

BACKGROUND

The ADVs SGPORVs provide a method for cooling the unit to residual heat removal (RHR) entry conditions should the preferred heat sink via the Steam Bypass System to the dump valves condenser not be available, as discussed in the FSAR, Section [10.3] (Ref. 1). This is done in conjunction with the Auxiliary Feedwater System emergency providing cooling water from the condensate storage tank (CST) (or, alternately, with main feedwater from the condenser hotwell or main condensate tanks, if available). ~~The ADVs may also be required to meet the design cooldown rate during a normal cooldown when steam pressure drops too low for maintenance of a vacuum in the condenser to permit use of the Steam Dump System.~~ ④ Ⓔ

One ADV SGPORV line for each of the [four] three steam generators is provided. Each ADV SGPORV line consists of one ADV SGPORV and an associated block upstream manual isolation valve.

The ADVs SGPORVs are provided with upstream block manual isolation valves to permit their being tested at power, and to provide an alternate means of isolation. The ADVs SGPORVs are equipped with pneumatic controllers to permit control of the cooldown rate.

The ADVs SGPORVs are ~~usually~~ provided with a ~~pressurized gas supply of bottled nitrogen~~ backup supply tank which is pressurized from the instrument air header via a check valve arrangement that, on a loss of pressure in the normal instrument air supply, automatically supplies ~~nitrogen~~ air to operate the ADVs SGPORVs. The ~~nitrogen~~ air supply is sized ~~to provide the sufficient pressurized gas to operate the ADVs for the time required for Reactor Coolant System cooldown to RHR entry conditions.~~ until manual operation of the SGPORVs can be established.

A description of the ADVs SGPORVs is found in Reference 1. The ADVs SGPORVs ~~are OPERABLE with only a DC power source available. In addition, handwheels are provided for local manual operation.~~ when they are capable of providing controlled relief of the main steam flow and capable of being fully opened and closed, either remotely or by local manual operation.

①

APPLICABLE SAFETY ANALYSES

The design basis of the ADVs SGPORVs is established by the capability to cool the unit to RHR entry conditions. ~~The design rate of [75]°F per hour is applicable for two steam generators, each with one ADV. This rate is adequate to cool the unit to RHR entry conditions with only one steam~~ Insert

(continued)

Rev. 0

INSERT

The SGPORVs are used in conjunction with auxiliary feedwater supplied from the ECST (or, alternately, with main feedwater from the condenser hotwell or main condensate tanks, if available). Adequate inventory is available in the ECST to support operation for 2 hours in MODE 3 followed by a 4 hour cooldown to the RHR entry conditions.

SG PORVs

1

BASES

APPLICABLE SAFETY ANALYSES (continued)

generator and one ADV, utilizing the cooling water supply available in the CST.

SGTR 2 SGPORVs

In the accident analysis presented in Reference 3, the ADVs are assumed to be used by the operator to cool down the unit to RHR entry conditions for accidents accompanied by a loss of offsite power. Prior to operator actions to cool down the unit, the ADVs and main steam safety valves (MSSVs) are assumed to operate automatically to relieve steam and maintain the steam generator pressure below the design value. For the recovery from a steam generator tube rupture (SGTR) event, the operator is also required to perform a limited cooldown to establish adequate subcooling as a necessary step to terminate the primary to secondary break flow into the ruptured steam generator. The time required to terminate the primary to secondary break flow for an SGTR is more critical than the time required to cool down to RHR conditions for this event ~~and also for other accidents~~. Thus, the SGTR is the limiting event for the ADVs. The number of ADVs required to be OPERABLE to satisfy the SGTR accident analysis requirements depends upon the number of unit loops and consideration of any single failure assumptions regarding the failure of one ADV to open on demand.

, which renders the condenser dump valves unavailable

when the SGTR is

SGPORVs

SGPORVs

The requirement for three SGPORVs to be OPERABLE satisfies the SGTR accident analysis requirements, including consideration of a single failure of one SGPORV to open on demand.

manual isolation SGPORV SGPORVs

The ADVs are equipped with block valves in the event an ADV spuriously fails to open or fails to close during use.

The ADVs satisfy Criterion 3 of the NRC Policy Statement.

10 CFR 50.36(c)(2)(ii)

1

2

LCO

SGPORV

[Three] ADV lines are required to be OPERABLE. One ADV line is required from each of [three] steam generators to ensure that at least one ADV line is available to conduct a unit cooldown following an SGTR, in which one steam generator becomes unavailable, accompanied by a single, active failure of a second ADV line on an unaffected steam generator. The block valves must be OPERABLE to isolate a failed open ADV line. A closed block valve does not render it or its ADV line inoperable if operator action time to open the block valve is supported in the accident analysis.

because

SGPORV SGPORV manual isolation manual isolation

3
3
1

Failure to meet the LCO can result in the inability to cool the unit to RHR entry conditions following an event in which

(continued)

Rev. 0

1

BASES

LCO (continued)

the condenser is unavailable for use with the Steam Bypass System. Dump

1

An ADV is considered OPERABLE when it is capable of providing controlled relief of the main steam flow and capable of fully opening and closing on demand. SGPORV remotely or by local manual operation

APPLICABILITY

In MODES 1, 2, and 3, and in MODE 4, when a steam generator is being relied upon for heat removal, the ADVs are required to be OPERABLE. SGPORVs

1

In MODE 5 or 6, an SGTR is not a credible event.

ACTIONS

A.1

SGPORV

With one required ADV line inoperable, action must be taken to restore OPERABLE status within 7 days. The 7 day Completion Time allows for the redundant capability afforded by the remaining OPERABLE ADV lines, a nonsafety grade backup in the Steam Bypass System, and MSSVs. Required Action A.1 is modified by a Note indicating that LCO 3.0.4 does not apply.

Dump SGPORV

B.1

With two or more ADV lines inoperable, action must be taken to restore all but one ADV line to OPERABLE status. Since the block valve can be closed to isolate an ADV, some repairs may be possible with the unit at power. The 24 hour Completion Time is reasonable to repair inoperable ADV lines, based on the availability of the Steam Bypass System and MSSVs, and the low probability of an event occurring during this period that would require the ADV lines.

upstream manual isolation SGPORV Dump

1

C.1 and C.2

SGPORV

If the ADV lines cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least

(continued)

Rev. 0

BASES

ACTIONS

C.1 and C.2 (continued)

24

MODE 3 within 6 hours, and in MODE 4, without reliance upon steam generator for heat removal, within [18] 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.

TSTF-352

SURVEILLANCE REQUIREMENTS

SR 3.7.4.1

SGPORVs

To perform a controlled cooldown of the RCS, the ADVs must be able to be opened either remotely or locally and throttled through their full range. This SR ensures that the ADVs are tested through a full control cycle at least once per fuel cycle. Performance of inservice testing or use of an ADV during a unit cooldown may satisfy this requirement. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. The Frequency is acceptable from a reliability standpoint. ①

SGPORVs

SGPORV

SR 3.7.4.2

upstream manual isolation

SGPORV

The function of the block valve is to isolate a failed open ADV. Cycling the block valve both closed and open demonstrates its capability to perform this function. Performance of inservice testing or use of the block valve during unit cooldown may satisfy this requirement. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. The Frequency is acceptable from a reliability standpoint. ①

REFERENCES

1. U FSAR, Section [10.3]. ① ③

2. UFSAR, Section 15.4.3 ①

Rev. 0

1. Changes are made (additions, deletions, and/or changes) to the ISTS, which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

3. The brackets have been removed and the proper plant specific information/value has been provided.

B 3.7 PLANT SYSTEMS

B 3.7.5 Auxiliary Feedwater (AFW) System

BASES

BACKGROUND

The AFW System automatically supplies feedwater to the steam generators to remove decay heat from the Reactor Coolant System upon the loss of normal feedwater supply. The AFW pumps take suction through separate and independent suction lines from the condensate storage tank (CST) (LCO 3.7.6) and pump to the steam generator secondary side via separate and independent connections to the main feedwater (MFW) piping outside containment. The steam generators function as a heat sink for core decay heat. The heat load is dissipated by releasing steam to the atmosphere from the steam generators via the main steam safety valves (MSSVs) (LCO 3.7.1) or ~~atmospheric dump valves~~ (LCO 3.7.4). If the main condenser is available, steam may be released via the steam ~~bypass~~ valves and recirculated to the ~~CST~~. Condenser hotwell

E emergency

Steam Generator Power Operated Relief Valves (SG PORVs)

dump

(4)

The AFW System consists of ~~[two]~~ motor driven AFW pumps and one steam turbine driven pump configured into ~~[three]~~ trains. Each ~~motor driven~~ pump ~~provides [100]% of AFW flow capacity, and the turbine driven pump provides [200]% of the required capacity to the steam generators, as assumed in the accident analysis~~. The pumps are equipped with ~~independent~~ recirculation lines to prevent pump operation against a closed system. Each motor driven AFW pump is powered from an independent Class 1E power supply and feeds ~~[two]~~ steam generators~~,~~ although each pump has the capability to be realigned ~~from the control room~~ to feed other steam generators. The steam turbine driven AFW pump receives steam from ~~two~~ main steam lines upstream of the main steam ~~isolation~~ valves. ~~Each of the steam feed lines will supply 100% of the requirements of the turbine driven AFW pump.~~

is aligned to one steam generator, and the capacity of each pump is sufficient to provide the design flow

one

normally

three

(MSTVs)

trip

Insert

3 (1)

(4)

The AFW System is capable of supplying feedwater to the steam generators during normal unit startup, shutdown, and hot standby conditions.

(5) may be aligned and supply

The ~~turbine driven~~ AFW pump ~~supplies~~ a common header capable of feeding all steam generators ~~with DC powered control valves actuated to the appropriate steam generator by the Engineered Safety Feature Actuation System (ESFAS)~~. One pump at full flow is sufficient to remove decay heat and cool the unit to residual heat removal (RHR) entry

(4)

(continued)

Rev. 0

INSERT

The steam supply lines combine into a header which is isolated from the steam driven auxiliary feedwater pump by two parallel valves. Main steam trip valves, MS-TV-111A and MS-TV-111B (Unit 1), MS-TV-211A and MS-TV-211B (Unit 2) are powered from separate 125 VDC trains and actuated by the Engineered Safety Features Actuation System (ESFAS). Opening of either trip valve will provide sufficient steam to the steam driven pump to produce the design flow rate from the ECST to the steam generator(s).

BASES

BACKGROUND (continued)

conditions. Thus, the requirement for diversity in motive power sources for the AFW System is met.

The AFW System is designed to supply sufficient water to the steam generator(s) to remove decay heat with steam generator pressure ~~at the~~ setpoint ~~of the~~ MSSVs. Subsequently, the AFW System supplies sufficient water to cool the unit to RHR entry conditions, with steam released through the ~~ADVs~~. SG PORVs 4

associated with the lowest

The AFW System actuates automatically on steam generator water level—low-low by the ESFAS (LCO 3.3.2). The system also actuates on loss of offsite power, safety injection, and trip of all MFW pumps.

The AFW System is discussed in the (U)FSAR, Section [10.4.~~9~~] 3.2 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The AFW System mitigates the consequences of any event with loss of normal feedwater.

The design basis of the AFW System is to supply water to the steam generator to remove decay heat and other residual heat by delivering at least the minimum required flow rate to the steam generators at pressures corresponding to the lowest steam generator safety valve set pressure plus 3%.

In addition, the AFW System must supply enough makeup water to replace steam generator secondary inventory lost as the unit cools to MODE 4 conditions. Sufficient AFW flow must also be available to account for flow losses such as pump recirculation and line breaks.

The limiting Design Basis Accidents (DBAs) and transients for the AFW System are as follows:

a. Feedwater Line Break (FWLB); ~~and~~

b. Main Steam Line Break (MSLB); and 4

c ~~b~~. Loss of MFW.

In addition, the minimum available AFW flow and system characteristics are ~~serious~~ considerations in the analysis of a small break loss of coolant accident (LOCA).

(continued)

Rev. 0

BASES

APPLICABLE SAFETY ANALYSES (continued)

The AFW System design is such that it can perform its function following an FWLB between the MFW isolation valves and containment, combined with a loss of offsite power following turbine trip, and a single active failure of the steam turbine driven AFW pump. In such a case, the ESFAS logic may not detect the affected steam generator if the backflow check valve to the affected MFW header worked properly. One motor driven AFW pump would deliver to the broken MFW header at ~~the pump runout~~ Maximum design flow until the problem was detected, and flow terminated by the operator. Sufficient flow would be delivered to the intact steam generator by the redundant AFW pump. (4)

The ESFAS automatically actuates the AFW turbine driven pump its dedicated ~~and associated power operated valves and controls~~ when required to ensure an adequate feedwater supply to ~~the~~ steam generator~~s~~ during loss of power. ~~DC power~~ Air or motor operated valves are provided for each AFW line to control the AFW flow to each steam generator. (4)

The AFW System satisfies the requirements of Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36 (c)(2)(ii). (3)

LCO

This LCO provides assurance that the AFW System will perform its design safety function to mitigate the consequences of accidents that could result in overpressurization of the reactor coolant pressure boundary. ~~[~~Three~~]~~ independent AFW pumps in ~~[~~three~~]~~ diverse trains are required to be OPERABLE to ensure the availability of ~~RHR~~ AFW capability for all events accompanied by a loss of offsite power and a single failure. This is accomplished by powering two of the pumps from independent emergency buses. The third AFW pump is powered by a different means, a steam driven turbine supplied with steam from a source that is not isolated by closure of the MSIVs. (1) (1) (2)

The AFW System is configured into ~~[~~three~~]~~ trains. The AFW System is considered OPERABLE when the components and flow paths required to provide redundant AFW flow to the steam generators are OPERABLE. This requires that the two motor driven AFW pumps be OPERABLE in ~~[~~two~~]~~ diverse paths, each supplying AFW to separate steam generators. The turbine driven AFW pump is required to be OPERABLE with redundant steam supplies from each of ~~[~~two~~]~~ main steam ~~lines~~ Supply paths through MS-TV-111A and MS-TV-111B (unit 1), MS-TV-211A and MS-TV-211B (unit 2), which recieve steam from the three main steam lines upstream (1) (1) (1) (4)

(continued)

Rev. 0

BASES

LCO (continued)

of the MSIVs, TTs, and ~~shall be capable of supplying AFW to any of the steam generators~~. The piping, valves, instrumentation, and controls in the required flow paths also are required to be OPERABLE. (4)

The LCO is modified by a Note indicating that one AFW train, which includes a motor driven pump, is required to be OPERABLE in MODE 4 when the steam generator is relied on for heat removal. This is because of the reduced heat removal requirements and short period of time in MODE 4 during which the AFW is required and the insufficient steam available in MODE 4 to power the turbine driven AFW pump. (5)

APPLICABILITY

In MODES 1, 2, and 3, the AFW System is required to be OPERABLE in the event that it is called upon to function when the MFW is lost. In addition, the AFW System is required to supply enough makeup water to replace the steam generator secondary inventory, lost as the unit cools to MODE 4 conditions.

In MODE 4, one ~~the~~ AFW ~~System~~ train ~~may be used~~ is required to be OPERABLE when the steam generators are relied on for heat removal ~~via the steam generators~~. (5)

In MODE 5 or 6, the steam generators are not normally used for heat removal, and the AFW System is not required.

ACTIONS

A.1 TSTF-340

If one of the two steam supplies or if a turbine driven pump is inoperable while in MODE 3 immediately following refueling to the turbine driven AFW train is inoperable, action must be taken to restore the inoperable equipment to an OPERABLE status within 7 days. The 7 day Completion Time is reasonable, based on the following reasons: TSTF-340 (1)

~~a. The redundant OPERABLE steam supply to the turbine driven AFW pump;~~

~~b. The availability of redundant OPERABLE motor driven AFW pumps; and~~ TSTF-340

~~c. The low probability of an event occurring that requires the inoperable steam supply to the turbine driven AFW pump.~~

Insert

(continued)

 (4)

, MS-TV-111A and MS-TV-111B (unit 1), MS-TV-211A and MS-TV-211B (unit 2),

Rev. 0

INSERT

a. For the inoperability of a steam supply to the turbine driven AFW pump, the 7 day Completion Time is reasonable since there is a redundant steam supply line for the turbine driven pump.

b. For the inoperability of a turbine driven AFW pump while in MODE 3 immediately subsequent to a refueling outage, the 7 day Completion Time is reasonable due to the minimal decay heat levels in this situation.

c. For both the inoperability of a steam supply line to the turbine driven pump and an inoperable turbine driven AFW pump while in MODE 3 immediately following a refueling outage, the 7 day Completion Time is reasonable due to the availability of redundant OPERABLE motor driven AFW pumps; and due to the low probability of an event requiring the use of the turbine driven AFW pump.

BASES

ACTIONS

A.1 (continued)

The second Completion Time for Required Action A.1 establishes a limit on the maximum time allowed for any combination of Conditions ~~to be inoperable~~ during any ~~continuous~~ Contiguous failure to meet this LCO. } ② ①

The 10 day Completion Time provides a limitation time allowed in this specified Condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The AND connector between 7 days and 10 days dictates that both Completion Times apply simultaneously, and the more restrictive must be met.

Insert

TSTF-340

B.1

With one of the required AFW trains (pump or flow path) inoperable in MODE 1, 2, or 3 ~~[~~for reasons other than Condition A~~]~~, action must be taken to restore OPERABLE status within 72 hours. This Condition includes the loss of two steam supply lines to the turbine driven AFW pump. The 72 hour Completion Time is reasonable, based on redundant capabilities afforded by the AFW System, time needed for repairs, and the low probability of a DBA occurring during this time period. } ①

The second Completion Time for Required Action B.1 establishes a limit on the maximum time allowed for any combination of Conditions to be inoperable during any ~~continuous~~ Contiguous failure to meet this LCO. ②

The 10 day Completion Time provides a limitation time allowed in this specified Condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The AND connector between 72 hours and 10 days dictates that both Completion Times apply simultaneously, and the more restrictive must be met.

C.1 and C.2

When Required Action A.1 ~~[~~or B.1~~]~~ cannot be completed within the required Completion Time, or if two AFW trains are ①

(continued)

Rev.0

INSERT

Condition A is modified by a Note which limits the applicability of the Condition to when the unit has not entered MODE 2 following a refueling. Condition A allows the turbine driven AFW train to be inoperable for 7 days vice the 72 hour Completion Time in Condition B. This longer Completion Time is based on the reduced decay heat following refueling and prior to the reactor being critical.

BASES

ACTIONS

C.1 and C.2 (continued)

inoperable in MODE 1, 2, or 3, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within ~~[~~18~~]~~ hours. (1)

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.

, when the steam generator is relied upon for heat removal,

In MODE 4 with two AFW trains inoperable, operation is allowed to continue because only one motor driven pump AFW train is required in accordance with the Note that modifies the LCO. Although not required, the unit may continue to cool down and initiate RHR. (5)

D.1

If all ~~[three]~~ AFW trains are inoperable in MODE 1, 2, or 3, the unit is in a seriously degraded condition with no safety related means for conducting a cooldown, and only limited means for conducting a cooldown with nonsafety related equipment. In such a condition, the unit should not be perturbed by any action, including a power change, that might result in a trip. The seriousness of this condition requires that action be started immediately to restore one AFW train to OPERABLE status. (1)

required by the Technical Specifications

Required Action D.1 is modified by a Note indicating that all required MODE changes or power reductions are suspended until one AFW train is restored to OPERABLE status. In this case, LCO 3.0.3 is not applicable because it could force the unit into a less safe condition. (2)

E.1

In MODE 4, either the reactor coolant pumps or the RHR loops can be used to provide forced circulation. This is addressed in LCO 3.4.6, "RCS Loops - MODE 4." With ~~one~~ the required AFW train inoperable, action must be taken to immediately restore the inoperable train to OPERABLE status. The immediate Completion Time is consistent with LCO 3.4.6. (2)

(continued)

Rev. 0

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

Verifying the correct alignment for manual, power operated, and automatic valves in the AFW System water and steam supply flow paths provides assurance that the proper flow paths will exist for AFW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

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

SR 3.7.5.2

Verifying that each AFW pump's developed head at the flow test point is greater than or equal to the required developed head ensures that AFW pump performance has not degraded during the cycle. Flow and differential head are normal tests of centrigufal pump performance required by Section XI of the ASME Code (Ref 2). Because it is Sometimes undesirable to introduce cold AFW into the steam generators while they are operating, this testing is typically performed on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. Performance of inservice testing discussed in the ASME Code, Section XI (Ref. 2) (only required at 3 month intervals) satisfies this requirement. ~~The [31] day Frequency on a STAGGERED TEST BASIS results in testing each pump once every 3 months, as required by Reference 2.~~ TSTF-101

centrifugal

(2)

[This SR is modified by a Note indicating that the SR should be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test.] (1) (4)

may be

(continued)

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.5.3

This SR verifies that AFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates an ESFAS, by demonstrating that each automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The ~~[18]~~ month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The ~~[18]~~ month Frequency is acceptable based on operating experience and the design reliability of the equipment. (1) (1)

This SR is modified by a Note that states the SR is not required in MODE 4. ~~[In MODE 4, the required AFW train is already aligned and operating.]~~ (4)

In MODE 4, the heat removal requirements would be less, providing more time for operator action to manually align the required valves.

SR 3.7.5.4

This SR verifies that the AFW pumps will start in the event of any accident or transient that generates an ESFAS by demonstrating that each AFW pump starts automatically on an actual or simulated actuation signal in MODES 1, 2, and 3. In MODE 4, the required pump ~~is already operating and the~~ 's autostart function is not required. The ~~[18]~~ month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. (4) (1)

This SR is modified by ~~[a]~~ ~~[two]~~ Note~~[s]~~. ~~[~~Note 1 indicates that the SR be deferred until suitable test conditions are established. This deferral is required because there ~~is~~ may be insufficient steam pressure to perform the test.~~]~~ ~~[The]~~ Note ~~[2]~~ states that the SR is not required in MODE 4. ~~[In MODE 4, the required pump is already operating and the autostart function is not required.]~~ ~~[~~In MODE 4, the heat removal requirements would be less providing more time for operator action to manually start the required AFW pump.~~]~~ (4) (1)

(continued)

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.4 (continued)

[~~Reviewer's Note: Some plants may not routinely use the AFW for heat removal in MODE 4. The second justification is provided for plants that use a startup feedwater pump rather than AFW for startup and shutdown.~~] ①

[SR 3.7.5.5 Ⓔ contiguous

This SR verifies that the AFW is properly aligned by verifying the flow paths from the CST to each steam ③ generator prior to entering MODE ② after more than 30 days in ~~MODE 5 or 6~~. OPERABILITY of AFW flow paths must be verified before sufficient core heat is generated that would require the operation of the AFW System during a subsequent shutdown. The Frequency is reasonable, based on engineering judgement and other administrative controls that ensure that flow paths remain OPERABLE. To further ensure AFW System alignment, flow path OPERABILITY is verified following extended outages to determine no misalignment of valves has Ⓔ occurred. This SR ensures that the flow path from the CST to the steam generators is properly aligned. ~~(This SR is not required by those units that use AFW for normal startup and shutdown.)~~]

any combination of MODE 5 or 6 or defueled.

TSTF-268 } ④

①

④

REFERENCES

1. ⓤFSAR, Section ~~10.4.9~~ 3.2 ④

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

Rev.0

1. The brackets have been removed and the proper plant specific information or value has been provided.

2. An editorial change is made for clarity, for consistency with the Improved Technical Specifications Writer's Guide, or for consistency with similar statements in the other ITS Bases.

3. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

4. Changes have been made (additions, deletions, or changes to the NUREG-1431) to reflect the facility-specific nomenclature, number, reference, system description, or analysis description.

5. This change to the Bases is necessary for consistency with the specification.

B 3.7 PLANT SYSTEMS

Emergency (E)
B 3.7.6 Condensate Storage Tank (CST) (4)

BASES

BACKGROUND

(E) (E)

The CST provides a safety grade source of water to the steam generators for removing decay and sensible heat from the Reactor Coolant System (RCS). The CST provides a passive flow of water, by gravity, to the Auxiliary Feedwater (AFW) System (LCO 3.7.5). The steam produced is released to the atmosphere by the main steam safety valves or the ~~atmospheric dump valves~~ Steam Generator Power Operated Relief Valves (SG PORVs). The AFW pumps operate with a continuous recirculation to the CST. (E)

When the main steam ~~isolation~~ trip valves are open, the preferred means of heat removal is to discharge steam to dump the condenser by the nonsafety grade path of the steam ~~bypass~~ valves. The condensed steam is returned to the ~~CST by the condensate transfer pump~~ hotwell and is pumped to the 300,000 condensate storage tank which can be aligned to gravity feed the ECST. This has the advantage of conserving condensate while minimizing releases to the environment.

(E)

Because the CST is a principal component in removing residual heat from the RCS, it is designed to withstand earthquakes and other natural phenomena, including missiles (E) that might be generated by natural phenomena. The CST is designed to Seismic Category I to ensure availability of the feedwater supply. Feedwater is also available from alternate sources.

(E) (u)

A description of the CST is found in the FSAR, Section [9.2.~~6~~] (4) (Ref. 1). (1) (4)

APPLICABLE SAFETY ANALYSES

(E) (u)

The CST provides cooling water to remove decay heat and to cool down the unit following all events in the accident analysis as discussed in the FSAR, Chapters [6] and [15] (Refs. 2 and 3, respectively). For anticipated operational occurrences and accidents that do not affect the OPERABILITY of the steam generators, the analysis assumption is ~~generally 30 minutes~~ 2 hours in at MODE 3, steaming through the MSSVs, ~~followed by a~~ cooldown to residual heat removal (RHR) entry conditions at 4 hour the design cooldown rate. (1) (1)(4) (4)

The limiting event for the condensate volume is the large feedwater line break coincident with a loss of offsite

(continued)

Rev.0

 4

BASES

accommodated by the accident

APPLICABLE SAFETY ANALYSES (continued)

power. Single failures ~~that also affect this event~~ include the following: 4

One

a. Failure of the diesel generator powering the motor driven AFW pump to the unaffected steam generator (requiring additional steam to drive the remaining AFW pump turbine); and 4

b. Failure of the steam driven AFW pump (requiring a longer time for cooldown using only one motor driven AFW pump).

These are not usually the limiting failures in terms of consequences for these events.

E

A nonlimiting event considered in CST inventory determinations is a break in either the main feedwater or AFW line near where the two join. This break has the potential for dumping condensate until terminated by operator action, since the ~~Emergency Feedwater Actuation System~~ would not detect a difference in pressure between the steam generators for this break location. This loss of condensate inventory is partially compensated for by the retention of steam generator inventory. 4

Engineered Safety Features Actuation System (LCO 3.3.2, ESFAS) starts the AFW System and

E

The CST satisfies Criterion 3 of ~~the NRC Policy Statement~~. 4

10 CFR 50.36 (c)(2)(ii) 3

LCO

E

To satisfy accident analysis assumptions, the CST must contain sufficient cooling water to remove decay heat for [30 minutes] following a reactor trip from 102% RTP, and then to cool down the RCS to RHR entry conditions, assuming a coincident loss of offsite power and the most adverse single failure. In doing this, it must retain sufficient water to ensure adequate net positive suction head for the AFW pumps during cooldown, as well as account for any losses from the steam driven AFW pump turbine, or before isolating AFW to a broken line. 4 1

4 hour

Contained

Or maintaining the unit in MODE 3 for 2 hours,

E

1

The CST level required is equivalent to a ~~usable~~ volume of ≥ [110,000 gallons], which is based on holding the unit in MODE 3 for [2] hours, followed by a cooldown to RHR entry conditions at [75]°F/hour. ~~This~~ basis is established in ~~Reference 4~~ ~~and exceeds the~~ ~~volume~~ ~~required by~~ the accident analysis. 1 1 4

The

for these times

within the limit of 100

(continued)

Rev. 0

BASES

LCO (continued)

The OPERABILITY of the (E) CST is determined by maintaining the tank level at or above the minimum required level to ensure the minimum volume of water. (4) (2)

APPLICABILITY

In MODES 1, 2, and 3, and in MODE 4, when steam generator is being relied upon for heat removal, the (E) CST is required to be OPERABLE. (4)

In MODE 5 or 6, the (E) CST is not required because the AFW System is not required. (4)

ACTIONS

A.1 and A.2

If the (E) CST ~~level~~ is not ~~within limits~~ OPERABLE, the OPERABILITY of the backup supply, the condensate storage tank, should be verified by administrative means within 4 hours and once every 12 hours thereafter. OPERABILITY of the backup feedwater supply must include verification that the flow paths from the backup water supply to the AFW pumps are OPERABLE, and that the backup (E) supply has the required volume of water available. The (E) CST must be restored to OPERABLE status within 7 days, because the backup supply may be performing this function in addition to its normal functions. The 4 hour Completion Time is reasonable, based on operating experience, to verify the OPERABILITY of the backup water supply. Additionally, verifying the backup water supply every 12 hours is adequate to ensure the backup water supply continues to be available. The 7 day Completion Time is reasonable, based on an OPERABLE backup water supply being available, and the low probability of an event occurring during this time period requiring the (E) CST. TSTF-140 (4) (4) (4) TSTF-174 (4)

B.1 and B.2

If the (E) CST cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4, without reliance on the steam generator for heat removal, within ~~[18]~~ (24) 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. TSTF-352 (1)

(continued)

Rev. 0

BASES (continued)

SURVEILLANCE REQUIREMENTS	SR 3.7.6.1
	E This SR verifies that the CST contains the required volume of cooling water. ~~(The required CST volume may be single value or a function of RCS conditions.)~~ The 12 hour Frequency is based on operating experience and the need for operator awareness of unit evolutions that may affect the E CST inventory between checks. Also, the 12 hour Frequency is considered adequate in view of other indications in the control room, including alarms, to alert the operator to abnormal deviations in the CST level. E 4 4 4 4
REFERENCES	1. U FSAR, Section ~~[~~9.2.6~~]~~. 4 4 1
	2. U FSAR, Chapter ~~[~~6~~]~~. 4 1
	3. U FSAR, Chapter ~~[~~15~~]~~. 4 1

Rev.0

1. The brackets have been removed and the proper plant specific information or value has been provided.

2. This is an editorial change for clarity, for consistency with the Improved Technical Specifications Writer's Guide, for consistency with similar statements in the other ITS Bases.

3. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

4. Changes have been made (additions, deletions, or changes to the NUREG-1431) to reflect the facility-specific nomenclature, number, reference, system description, or analysis description.

B 3.7 PLANT SYSTEMS

B 3.7.7 Component Cooling Water (CCW) System

BASES

BACKGROUND

The CCW System provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation, the CCW System also provides this function for various nonessential components, as well as the spent fuel storage pool. The CCW System serves as a barrier to the release of radioactive byproducts between potentially radioactive systems and the Service Water System, and thus to the environment.

A typical CCW System is arranged as two independent, full capacity cooling loops, and has isolatable nonsafety related components. Each safety related train includes a full capacity pump, surge tank, heat exchanger, piping, valves, and instrumentation. Each safety related train is powered from a separate bus. An open surge tank in the system provides pump trip protective functions to ensure that sufficient net positive suction head is available. The pump in each train is automatically started on receipt of a safety injection signal, and all nonessential components are isolated. (1)

Additional information on the design and operation of the system, along with a list of the components served, is presented in the FSAR, Section [9.2.2] (Ref. 1). The principal safety related function of the CCW System is the removal of decay heat from the reactor via the Residual Heat Removal (RHR) System. This may be during a normal or post accident cooldown and shutdown.

APPLICABLE SAFETY ANALYSES

The design basis of the CCW System is for one CCW train to remove the post loss of coolant accident (LOCA) heat load from the containment sump during the recirculation phase, with a maximum CCW temperature of [120]°F (Ref. 2). The Emergency Core Cooling System (ECCS) LOCA and containment OPERABILITY LOCA each model the maximum and minimum performance of the CCW System, respectively. The normal temperature of the CCW is [80]°F, and, during unit cooldown to MODE 5 (T_{cold} < [200]°F), a maximum temperature of 95°F is

(continued)

Rev. 0

BASES

APPLICABLE SAFETY ANALYSES (continued)

assumed. This prevents the containment sump fluid from increasing in temperature during the recirculation phase following a LOCA, and provides a gradual reduction in the temperature of this fluid as it is supplied to the Reactor Coolant System (RCS) by the ECCS pumps.

The CCW System is designed to perform its function with a single failure of any active component, assuming a loss of offsite power.

The CCW System also functions to cool the unit from RHR entry conditions (T_{cold} < [350]°F), to MODE 5 (T_{cold} < [200]°F), during normal and post accident operations. The time required to cool from [350]°F to [200]°F is a function of the number of CCW and RHR trains operating. One CCW train is sufficient to remove decay heat during subsequent operations with T_{cold} < [200]°F. This assumes a maximum service water temperature of [95]°F occurring simultaneously with the maximum heat loads on the system. 1

The CCW System satisfies Criterion 3 of the NRC Policy Statement.

LCO

The CCW trains are independent of each other to the degree that each has separate controls and power supplies and the operation of one does not depend on the other. In the event of a DBA, one CCW train is required to provide the minimum heat removal capability assumed in the safety analysis for the systems to which it supplies cooling water. To ensure this requirement is met, two trains of CCW must be OPERABLE. At least one CCW train will operate assuming the worst case single active failure occurs coincident with a loss of offsite power.

A CCW train is considered OPERABLE when:

a. The pump and associated surge tank are OPERABLE; and

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

The isolation of CCW from other components or systems not required for safety may render those components or systems

(continued)

Rev. 0

BASES

LCO (continued)

inoperable but does not affect the OPERABILITY of the CCW System.

APPLICABILITY

In MODES 1, 2, 3, and 4, the CCW System is a normally operating system, which must be prepared to perform its post accident safety functions, primarily RCS heat removal, which is achieved by cooling the RHR heat exchanger.

In MODE 5 or 6, the OPERABILITY requirements of the CCW System are determined by the systems it supports.

ACTIONS

A.1

Required Action A.1 is modified by a Note indicating that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops—MODE 4," be entered if an inoperable CCW train results in an inoperable RHR loop. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. (1)

If one CCW train is inoperable, action must be taken to restore OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE CCW train is adequate to perform the heat removal function. The 72 hour Completion Time is reasonable, based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this period.

B.1 and B.2

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

(continued)

Rev.0

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

This SR is modified by a Note indicating that the isolation of the CCW flow to individual components may render those components inoperable but does not affect the OPERABILITY of the CCW System.

Verifying the correct alignment for manual, power operated, and automatic valves in the CCW flow path provides assurance that the proper flow paths exist for CCW 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. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. (1)

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

SR 3.7.7.2

This SR verifies proper automatic operation of the CCW valves on an actual or simulated actuation signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit 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 is acceptable from a reliability standpoint.

~~(continued)~~

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.7.3

This SR verifies proper automatic operation of the CCW pumps on an actual or simulated actuation signal. The CCW System is a normally operating system that cannot be fully actuated as part of routine testing during normal operation. The [18] month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit 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 is acceptable from a reliability standpoint.

(1)

REFERENCES

1. FSAR, Section [9.2.2].
2. FSAR, Section [6.2].

Rev. 0

1. Changes are made to reflect those changes made to the ISTS.

(4)

B 3.7 PLANT SYSTEMS

B 3.7.18 Secondary Specific Activity 7

(4)

BASES

BACKGROUND

Activity in the secondary coolant results from steam generator tube outleakage from the Reactor Coolant System (RCS). Under steady state conditions, the activity is primarily iodines with relatively short half lives and, thus, indicates current conditions. During transients, I-131 spikes have been observed as well as increased releases of some noble gases. Other fission product isotopes, as well as activated corrosion products in lesser amounts, may also be found in the secondary coolant.

A limit on secondary coolant specific activity during power operation minimizes releases to the environment because of normal operation, anticipated operational occurrences, and accidents.

This limit is lower than the activity value that might be expected from a 1 gpm tube leak (LCO 3.4.13, "RCS Operational LEAKAGE") of primary coolant at the limit of [1.0] μCi/gm (LCO 3.4.16, "RCS Specific Activity"). The steam line failure is assumed to result in the release of the noble gas and iodine activity contained in the steam generator inventory, the feedwater, and the reactor coolant LEAKAGE. Most of the iodine isotopes have short half lives, (i.e., < 20 hours). I-131, with a half life of 8.04 days, concentrates faster than it decays, but does not reach equilibrium because of blowdown and other losses. (2)

TSTF-173

With the specified activity limit, the resultant 2 hour thyroid dose to a person at the exclusion area boundary (EAB) would be about 0.58 rem if the main steam safety valves (MSSVs) open for 2 hours following a trip from full power.

Operating a unit at the allowable limits could result in a 2 hour EAB exposure of a small fraction of the 10 CFR 100 (Ref. 1) limits, or the limits established as the NRC staff approved licensing basis.

(continued)

Rev 0

BASES (continued)

APPLICABLE SAFETY ANALYSES

The accident analysis of the main steam line break (MSLB), as discussed in the FSAR, Chapter [15] (Ref. 2) assumes the initial secondary coolant specific activity to have a radioactive isotope concentration of [0.10] μCi/gm DOSE EQUIVALENT I-131. This assumption is used in the analysis for determining the radiological consequences of the postulated accident. The accident analysis, based on this and other assumptions, shows that the radiological consequences of an MSLB do not exceed a small fraction of the unit EAB limits (Ref. 1) for whole body and thyroid dose rates. 1 2

With the loss of offsite power, the remaining steam generators are available for core decay heat dissipation by venting steam to the atmosphere through the MSSVs and steam generator atmospheric dump valves (ADVs). The Auxiliary Feedwater System supplies the necessary makeup to the steam generators. Venting continues until the reactor coolant temperature and pressure have decreased sufficiently for the Residual Heat Removal System to complete the cooldown. 1

power operated relief valves (SGPORVs)

In the evaluation of the radiological consequences of this accident, the activity released from the steam generator connected to the failed steam line is assumed to be released directly to the environment. The unaffected steam generator is assumed to discharge steam and any entrained activity through the MSSVs and ADVs during the event. Since no credit is taken in the analysis for activity plateout or retention, the resultant radiological consequences represent a conservative estimate of the potential integrated dose due to the postulated steam line failure. 1

SGPORV

Secondary specific activity limits satisfy Criterion 2 of the NRC Policy Statement. 3

10 CFR 50.36 (c)(2)(ii)

LCO

As indicated in the Applicable Safety Analyses, the specific activity of the secondary coolant is required to be ≤ [0.10] μCi/gm DOSE EQUIVALENT I-131 to limit the radiological consequences of a Design Basis Accident (DBA) to a small fraction of the required limit (Ref. 1). 2

Monitoring the specific activity of the secondary coolant ensures that when secondary specific activity limits are exceeded, appropriate actions are taken in a timely manner

(continued)

Rev. 0

BASES

LCO (continued)

to place the unit in an operational MODE that would minimize the radiological consequences of a DBA.

APPLICABILITY

In MODES 1, 2, 3, and 4, the limits on secondary specific activity apply due to the potential for secondary steam releases to the atmosphere.

In MODES 5 and 6, the steam generators are not being used for heat removal. Both the RCS and steam generators are depressurized, and primary to secondary LEAKAGE is minimal. Therefore, monitoring of secondary specific activity is not required.

ACTIONS

A.1 and A.2

DOSE EQUIVALENT I-131 exceeding the allowable value in the secondary coolant, is an indication of a problem in the RCS and contributes to increased post accident doses. If the secondary specific activity cannot be restored to within limits within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.18.1 7 4

This SR verifies that the secondary specific activity is within the limits of the accident analysis. A gamma isotopic analysis of the secondary coolant, which determines DOSE EQUIVALENT I-131, confirms the validity of the safety analysis assumptions as to the source terms in post accident releases. It also serves to identify and trend any unusual isotopic concentrations that might indicate changes in reactor coolant activity or LEAKAGE. The 31 day Frequency is based on the detection of increasing trends of the level

(continued)

Rev.0

BASES

SURVEILLANCE REQUIREMENTS	SR 3.7.18.1 (continued) 7 4 of DOSE EQUIVALENT I-131, and allows for appropriate action to be taken to maintain levels below the LCO limit.
REFERENCES	1. 10 CFR 100.11. 2. U FSAR, Chapter e [15]. 1 2

Rev. 0

1. Changes are made (additions, deletions, and/or changes) to the ISTS, which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The brackets have been removed and the proper plant specific information/value has been provided.

3. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

4. Changes made to the Bases to be consistent with changes made to the Specification are.

(3)

B 3.7 PLANT SYSTEMS

B 3.7.8 Service Water System (SWS) (SW)

(3) (1)

BASES

BACKGROUND

The SWS System provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation, and a normal shutdown, the SWS also provides this function for various safety related and nonsafety related components. The safety related function is covered by this LCO. (3) (3)

~~The SWS consists of two separate, 100% capacity, safety related, cooling water trains. Each train consists of two 100% capacity pumps, one component cooling water (CCW) heat exchanger, piping, valving, instrumentation, and two cyclone separators. The pumps and valves are remote and manually aligned, except in the unlikely event of a loss of coolant accident (LOCA). The pumps aligned to the critical loops are automatically started upon receipt of a safety injection signal, and all essential valves are aligned to their post accident positions. The SWS also provides emergency makeup to the spent fuel pool and CCW System [and is the backup water supply to the Auxiliary Feedwater System].~~ Insert (1)

Additional information about the design and operation of the SWS System, along with a list of the components served, is presented in the U FSAR, Section [9.2.1] (Ref. 1). The principal safety related function of the SWS System is the removal of decay heat from the reactor following a DBA via the CCW RS System. (3) (2) (1)

APPLICABLE SAFETY ANALYSES

The design basis of the SWS RS System is for one SWS train loop, in conjunction with the CCW System ~~and a 100% capacity containment cooling system~~, to remove core decay heat following a design basis LOCA as discussed in the U FSAR, Section ~~[6.2]~~ 6.2.2 (Ref. 2). This prevents the containment sump fluid from increasing in temperature, once the cooler RWST water has reached equilibrium with the fluid in containment, during the recirculation phase following a LOCA and provides for a gradual reduction in the temperature of this fluid ~~as it~~ which is supplied to the Reactor Coolant System by the ECCS pumps. The SW System also prevents the build up of containment pressure from exceeding the containment design pressure by removing heat through the RS System heat exchangers. The SWS System is designed to perform its function with a single failure of any active component, assuming the loss of offsite power. (1) (3) (2) (1) (3) (8) (7)

(continued)

Rev. 0

INSERT 1

The SW System is common to Units 1 and 2 and is designed for the simultaneous operation of various subsystems and components of both units. The source of cooling water for the SW System is the Service Water Reservoir. The SW System consists of two loops and components can be aligned to operate on either loop. There are four main SW pumps taking suction on the Service Water Reservoir, supplying various components through the supply headers, and then returning to the Service Water Reservoir through the return headers. The main SW pumps are powered from the four emergency buses (two from each unit). There are also two auxiliary SW pumps which take suction on North Anna Reservoir and discharge to the supply header. When the auxiliary SW pumps are in service, with the return header may be redirected to waste heat treatment facility if desired. However, the auxiliary SW pumps are strictly a backup to the normal arrangement and are not credited in the analysis for a DBA.

During a design basis loss of coolant accident (LOCA) concurrent with a loss of offsite power to both units, one SW loop will provide sufficient cooling to supply post-LOCA loads on one unit and shutdown and cooldown loads on the other unit. During a DBA, the two SW loops are cross-connected at the recirculation spray (RS) heat exchanger supply and return headers of the accident unit. On a Safety Injection (SI) signal on either unit, all four main SW pumps start and the system is aligned for Service Water Reservoir spray operation. On a containment high-high pressure signal the accident unit's component cooling water (CC) heat exchangers are isolated from the SW System and its RS heat exchangers are placed into service. All safety-related systems or components requiring cooling during an accident are cooled by the SW System, including the RS heat exchangers, main control room air conditioning condensers, and charging pump lubricating oil and gearbox coolers.

The SW System also provides cooling to the instrument air compressors, which are not safety-related, and the non-accident unit's CC heat exchangers, and serves as a backup water supply to the Auxiliary Feedwater System, the spent fuel pool coolers, and the containment recirculation air cooling coils. The SW System has sufficient redundancy to withstand a single failure, including the failure of an emergency diesel generator on the affected unit.

 3

BASES

APPLICABLE SAFETY ANALYSES (continued)

System

The SWS, in conjunction with the CCW System, also cools the unit from residual heat removal (RHR), as discussed in the FSAR, Section [5.4.7] (Ref. 3) entry conditions to MODE 5 during normal and post accident operations. The time required for this evolution is a function of the number of CCW and RHR System trains that are operating. ~~[One SWS train is sufficient to remove decay heat during subsequent operations in MODES 5 and 6. This assumes a maximum SWS temperature of [95]°F occurring simultaneously with maximum heat loads on the system.~~ 3 3 2 5

U2 5.5.4

System 10 CFR 50.36(c)(2)(ii)

The SWS satisfies Criterion 3 of ~~the NRC Policy Statement~~. 4

LCO

loops

Two ~~SWS trains~~ are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post accident heat loads, assuming that the worst case single active failure occurs coincident with the loss of offsite power. 3

loop is

An SWS ~~train is~~ considered OPERABLE during MODES 1, 2, 3, and 4 when: 3

a. ~~The pump is OPERABLE; and~~ Insert 1 1

b. The associated piping, valves, ~~heat exchanger,~~ and instrumentation and controls required to perform the safety related function are OPERABLE. 1

APPLICABILITY

System

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

System

In MODES 5 and 6, the OPERABILITY requirements of the SWS are determined by the systems it supports. 3

ACTIONS

C ~~A~~.1 Insert 2 6

loop for reasons other than Condition A

If one ~~SWS train~~ is inoperable, action must be taken to restore OPERABLE status ~~within 72 hours~~. In this Condition, 6

the loop to

(continued)

Rev. 0

INSERT 1

a. Two SW pumps are OPERABLE in an OPERABLE flow path; and

INSERT 2

A.1

If one SW pump is inoperable, the flow resistance of the system must be adjusted within 72 hours by throttling component cooling water heat exchanger flows to ensure that design flows to the RS System heat exchangers are achieved following an accident. The required resistance is obtained by throttling SW flow through the CC heat exchangers. In this configuration, a single failure disabling a SW pump would not result in loss of the SW System function.

B.1 and B.2

If one or more SW System loops are inoperable due to only two SW pumps being OPERABLE, the flow resistance of the system must be adjusted within one hour to ensure that design flows to the RS System heat exchangers are achieved if no additional failures occur following an accident. The required resistance is obtained by throttling SW flow through the CC heat exchangers. Two SW pumps aligned to one loop or one SW pump aligned to each loop is capable of performing the safety function if CC heat exchanger flow is properly throttled. However, overall reliability is reduced because a single failure disabling a SW pump could result in loss of the SW System function. The one hour time reflects the need to minimize the time that two pumps are inoperable and CC heat exchanger flow is not properly throttled, but is a reasonable time based on the low probability of a DBA occurring during this time period. Restoring one SW pump to OPERABLE status within 72 hours together with the throttling ensures that design flows to the RS System heat exchangers are achieved following an accident. The required resistance is obtained by throttling SW flow through the CC heat exchangers. In this configuration, a single failure disabling a SW pump would not result in loss of the SW System function.

ACTIONS C A.1 (continued) 6

the remaining OPERABLE SWS ~~train~~ loop is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE SWS ~~train~~ loop could result in loss of SWS System function. ~~Required Action A.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," should be entered if an inoperable SWS train results in an inoperable emergency diesel generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops—MODE 4," should be entered if an inoperable SWS train results in an inoperable decay heat removal train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.~~ Insert 1 The 72 hour and 7 day Completion Time~~is~~s are both based on the redundant capabilities afforded by the OPERABLE ~~train~~ loop and the low probability of a DBA occurring during this time period. Insert 2

D B.1 and B.2 6 3

If the SWS ~~train~~ pumps or loop cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. Insert 3 6

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

This SR is modified by a Note indicating that the isolation of the SWS System components or systems may render those components inoperable, but does not affect the OPERABILITY of the SWS System. 3

Verifying the correct alignment for manual, power operated, and automatic valves in the SWS flow path provides assurance that the proper flow paths exist for SWS System operation. This SR does not apply to valves that are locked, sealed, or

(continued)

Rev.0

INSERT 1

The inoperable SW loop is required to be restored to OPERABLE status within 72 hours unless the criteria for a 7 day Completion Time are met, as stated in the 72 hour Completion Time Note. The 7 day Completion Time applies if the three criteria in the 7 day Completion Time Note are met.

The first criterion in the 7 day Completion Time Note states that the 7 day Completion Time is only applicable if the inoperability of one SW loop is part of SW System upgrades. Service Water System upgrades include modification and maintenance activities associated with the installation of new discharge headers and spray arrays, mechanical and chemical cleaning of SW System piping and valves, pipe repair and replacement, valve repair and replacement, installation of corrosion mitigation measures and inspection of and repairs to buried piping interior coatings and pump or valve house components. The second criterion in the 7 day Completion Time Note states that the 7 day Completion Time is only applicable if three SW pumps are OPERABLE from initial Condition entry, including one SW pump being allowed to not have automatic start capability. The third criterion in the 7 day Completion Time Note states that the 7 day Completion Time is only applicable if two auxiliary SW pumps are OPERABLE from initial Condition entry.

INSERT 2

The 7 day Completion Time also credits the redundant capabilities afforded by three OPERABLE SW pumps (one without automatic start capability) and two OPERABLE auxiliary SW pumps.

INSERT 3

E.1 and E.2

If two SW loops are inoperable for reasons other than only two SW pumps being OPERABLE, the SW System cannot perform the safety function. With two SW loops inoperable, the CC System and, consequently, the Residual Heat Removal (RHR) System have no heat sink and are inoperable. Twelve hours is allowed to enter MODE 4, in which the Steam Generators can be used for decay heat removal to maintain reactor temperature. Twelve hours is reasonable, based on operating experience, to reach MODE 4 from full power conditions in an orderly manner and without challenging unit systems. The unit may then remain in MODE 4 until a method to further cool the units becomes available, but actions to determine a method and cool the unit to a condition outside of the Applicability must be initiated within one hour and continued in a reasonable manner and without delay until the unit is brought to MODE 5.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1 (continued)

otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

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

SR 3.7.8.2

This SR verifies proper automatic operation of the ~~SWS~~ System valves on an actual or simulated actuation signal. The ~~SWS~~ System is a normally operating system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The ~~[18]~~ 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit 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]~~ 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint. 3 2 2

SR 3.7.8.3

This SR verifies proper automatic operation of the ~~SWS~~ System pumps on an actual or simulated actuation signal. The ~~SWS is a~~ System normally operating system that cannot be fully actuated as part of normal testing during normal operation. The ~~[18]~~ 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit 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]~~ 18 month 3 2 2

(continued)

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS	SR 3.7.8.3 (continued) Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.
REFERENCES	1. U FSAR, Section ~~9~~9.2.1~~4~~ 3 2 2. U FSAR, Section ~~[6.2]~~. 6.2.2 3 2 3. U FSAR, Section ~~[5.4.7]~~. 5.5.4 3 2

Rev: 0

1. The Service Water (SW) System Bases have been revised to reflect the plant-specific design and licensing basis.

2. The brackets have been removed and the proper plant specific information/value has been provided.

3. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

4. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

5. The discussion in the Applicable Safety Analyses of one SWS train being sufficient to remove decay heat in MODES 5 and 6 is deleted. This discussion addresses specific capabilities outside the MODE of Applicability, is not appropriate for this specification, and could be misleading. A phrase retained in the Bases Applicability discussion is more appropriate, stating, "In MODES 5 and 6, the OPERABILITY requirements of the SW System are determined by the systems it supports."

6. Changes are made to reflect those changes made to the ISTS. The following requirements are renumbered or revised, where applicable, to reflect the changes.

7. The ISTS Bases in the ASA section discusses that the removal of core decay heat prevents the containment sump fluid from increasing in temperature during the recirculation phase. Because the NAPS design includes injecting water from the RWST, the sump fluid temperature will increase until an equilibrium is reached with the fluid in containment. At this point, the RS heat exchangers will remove the heat via the SW System. A discussion was added to the Bases to reflect this.

8. The NAPS design utilizes SW to remove decay heat from the reactor via the RS System directly during a DBA as opposed to using the CC System as is assumed in NUREG-1431. The Bases have been revised to reflect this NAPS design feature.

B 3.7 PLANT SYSTEMS

B 3.7.9 Ultimate Heat Sink (UHS)

BASES

(SW)

BACKGROUND

The UHS provides a heat sink for processing and operating heat from safety related components during a transient or accident, as well as during normal operation. This is done by utilizing the Service Water System (SWS) ~~and the Component Cooling Water (CCW) System~~.

①

~~The UHS has been defined as that complex of water sources, including necessary retaining structures (e.g., a pond with its dam, or a river with its dam), and the canals or conduits connecting the sources with, but not including, the cooling water system intake structures as discussed in the FSAR, Section [9.2.5] (Ref. 1). If cooling towers or portions thereof are required to accomplish the UHS safety functions, they should meet the same requirements as the sink.~~ The two principal functions of the UHS are the dissipation of residual heat after reactor shutdown, and dissipation of residual heat after an accident.

Insert 1

~~A variety of complexes is used to meet the requirements for a UHS. A lake or an ocean may qualify as a single source. If the complex includes a water source contained by a structure, it is likely that a second source will be required.~~

~~The basic performance requirements are that a 30 day supply of water be available, and that the design basis temperatures of safety related equipment not be exceeded. Basins of cooling towers generally include less than a 30 day supply of water, typically 7 days or less. A 30 day supply would be dependent on other source(s) and makeup system(s) for replenishing the source in the cooling tower basin. For smaller basin sources, which may be as small as a 1 day supply, the systems for replenishing the basin and the backup source(s) become of sufficient importance that the makeup system itself may be required to meet the same design criteria as an Engineered Safety Feature (e.g., single failure considerations), and multiple makeup water sources may be required.~~

①

Insert 2

(continued)

Rev. 0

INSERT 1

The ultimate heat sink is the Service Water Reservoir and its associated retaining structures, and is the normal source of service water for Units 1 and 2.

The Service Water Reservoir is located approximately 500 ft. south of the station site area. The Service Water Reservoir is adequate to provide sufficient cooling to permit simultaneous safe shutdown and cooldown of both units, and then maintain them in a safe-shutdown condition. Further, in the event of a design basis loss of coolant accident (LOCA) in one unit concurrent with a loss of offsite power to both units, the Service Water Reservoir is designed to provide sufficient water inventory to supply post-LOCA loads on one unit and shutdown and cooldown loads on the other unit and maintain them in a safe-shutdown condition for at least 30 days without makeup. After 30 days, makeup to the Service Water Reservoir is provided from the North Anna Reservoir as necessary to maintain cooling water inventory, ensuring a continued cooling capability. The Service Water Reservoir spray system is designed for operation of two units based on the occurrence of a LOCA on one unit with cooldown of the non-accident unit and simultaneous loss of offsite power to both units.

INSERT 2

The North Anna Reservoir provides a backup source of service water using the auxiliary SW pumps, and can provide makeup water to the Service Water Reservoir using the Circulating Water screen wash pumps, but is not credited for the DBA. The Lake Anna Dam impounds a lake with a surface area of 13,000 acres and 305,000 acre-ft. of storage, at its normal-stage elevation of 250 ft., along the channel of the North Anna River. The lake is normally used by the power station as a cooling pond for condenser circulating water. To improve the thermal performance of the lake, it has been divided by a series of dikes and canals into two parts. The larger, referred to as the North Anna Reservoir, is 9600 acres. The smaller part, called the waste heat treatment facility, is 3400 acres. When the North Anna Reservoir is used by the SW System, water is withdrawn from the North Anna Reservoir and discharged to the waste heat treatment facility, though it is possible to discharge water to the Service Water Reservoir.

The two sources of water are independent, and each has separate, redundant supply and discharge headers. The only common points are the main redundant supply and discharge headers in the service building where distribution to the components takes place. These common headers are encased in concrete.

BASES

BACKGROUND (continued)

Additional information on the design and operation of the system, along with a list of components served, can be found in Reference 1.

APPLICABLE SAFETY ANALYSES

The UHS is the sink for heat removed from the reactor core following all accidents and anticipated operational occurrences in which the unit is cooled down and placed on residual heat removal (RHR) operation. ~~For units that use UHS as the normal heat sink for condenser cooling via the Circulating Water System, unit operation at full power is its maximum heat load.~~ Its maximum post accident heat load occurs ~~20 minutes~~ in the first hour after a design basis ~~loss of coolant accident (LOCA)~~. ~~Near~~ During this time, ~~the unit switches from injection to recirculation and the containment cooling systems and RHR are required~~ the Recirculation Spray (RS) subsystems have started to remove the core decay heat. (1)

The operating limits are based on ~~conservative~~ heat transfer analyses for the worst case LOCA. ~~Reference 1~~ The analyses provide~~s~~ the details of the assumptions used in the analysis, which include worst expected meteorological conditions, conservative uncertainties when calculating decay heat, and the worst case single active failure (e.g., single failure of a~~n~~ ~~manmade structure~~ EPG). The UHS is designed in accordance with the Regulatory Guide 1.27 (Ref. 2)~~, which requires~~ requirement for a 30 day supply of cooling water in the UHS. (1) (1) (1)

The UHS satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii). (2)

LCO

The UHS is required to be OPERABLE ~~and~~. The UHS is considered OPERABLE if it contains a sufficient volume of water at or below the maximum temperature that would allow the SW~~S~~ System to operate for at least 30 days following the design basis LOCA without the loss of net positive suction head (NPSH), and without exceeding the maximum design temperature of the equipment served by the SW~~S~~ System. To meet this condition, the ~~UHS~~ Service Water Reservoir temperature should not exceed [~~90~~ 95°F] and the level should not fall below [~~562~~ 313 ft mean sea level] during normal unit operation. (1) (1) (4)

(continued)

Rev. 0

BASES (continued)

APPLICABILITY

In MODES 1, 2, 3, and 4, the UHS is required to support the OPERABILITY of the equipment serviced by the UHS and required to be OPERABLE in these MODES.

In MODE 5 or 6, the OPERABILITY requirements of the UHS are determined by the systems it supports.

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.~~ 3

~~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 reasonably complete the Required Action.]~~

A B.1 and B.2 A

~~[If the cooling tower fan cannot be restored to OPERABLE status within the associated Completion Time, or]~~ If the UHS is inoperable ~~[for reasons other than Condition A]~~ the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours. 3

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 3.7.9.1 4

This SR verifies that adequate long term (30 day) cooling can be maintained. The specified level also ensures that sufficient NPSH is available to operate the SW pumps. The [24] hour Frequency is based on operating experience related to trending of the parameter variations during the] 1 4

(continued)

Rev. 0

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.9.1 (continued) Service Water reservoir 1

applicable MODES. This SR verifies that the UHS water level is ≥ [562] 313 ft (mean sea level), USGS datum 1, 4

SR 3.7.9.2

This SR verifies that the SW System is available ~~to cool the CCW System to at least its maximum design temperature~~ with the maximum accident or normal design heat loads for 30 days following a Design Basis Accident. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. This SR verifies that the average water temperature of the UHS Service Water Reservoir is ≤ [90] 95°F as measured at the service water pump outlet. 1, 4, 1, 4

~~SR 3.7.9.3~~

~~Operating each cooling tower fan for ≥ [15] minutes ensures that all fans are OPERABLE and that all associated controls are functioning properly. It also ensures that fan or motor failure, or excessive vibration, can be detected for corrective action. The 31 day Frequency is based on operating experience, the known reliability of the fan units, the redundancy available, and the low probability of significant degradation of the UHS cooling tower fans occurring between surveillances.~~ 3

~~SR 3.7.9.4~~

~~This SR verifies that each cooling tower fan starts and operates on an actual or simulated actuation signal. The [18] month Frequency is consistent with the typical refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the [18] month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.~~

REFERENCES

1. UFSAR, Section 9.2.5. 1, 4
2. Regulatory Guide 1.27, March, 1974. 1

Rev. 0

1. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

3. Changes are made to reflect those changes made to the ISTS. The following requirements are renumbered or revised, where applicable, to reflect the changes.

4. The brackets have been removed and the proper plant specific information/value has been provided.

MCR/ESGR EVS - MODES 1, 2, 3, and 4

CREFS

/Emergency Switchgear Room (MCR/ESGR)

Main

B 3.7 PLANT SYSTEMS

Ventilation

EVS

- MODES 1, 2, 3, and 4

B 3.7.10 Control Room Emergency Filtration System (CREFS)

The MCR/ESGR EHS consists of the MCR/ESGR bottled air system (LCO 3.7.13) and the MCR/ESGR EVS (LCO 3.7.10 and LCO 3.7.14).

BASES

MCR/ESGR Emergency Habitability System (EHS)

BACKGROUND

The CREFS provides a protected environment from which operators can control the unit following an uncontrolled release of radioactivity~~[, chemicals, or toxic gas]~~.

can filter and

heater, four, air to, filter

The CREFS consists of two independent, redundant trains that recirculate and filter the control room air. Each train consists of a prefilter or demister, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, valves or dampers, and instrumentation also form part of the system, ~~as well as demisters to remove water droplets from the air stream. A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case of failure of the main HEPA filter bank.~~

INSERT 1

MCR/ESGR EVS

MCR/ESGR envelope

air inside the MCR/ESGR envelope, or supply

INSERT 3

MCR/ESGR envelope

~~The CREFS is an emergency system, parts of which may also operate during normal unit operations in the standby mode of operation. Upon receipt of the actuating signal(s), normal air supply to the control room is isolated, and the stream of ventilation air is recirculated through the system filter trains.~~ The prefilters or demisters remove any large particles in the air, and any entrained water droplets present, to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 10 hours per month, with the heaters on, reduces moisture buildup on the HEPA filters and adsorbers. Both the demister and heater are important to the effectiveness of the charcoal adsorbers.

INSERT 2

and exhaust from

moisture

HEPA filters and

~~Actuation of the CREFS places the system in either of two separate states (emergency radiation state or toxic gas isolation state) of the emergency mode of operation, depending on the initiation signal. Actuation of the system to the emergency radiation state of the emergency mode of operation, closes the unfiltered outside air intake and unfiltered exhaust dampers, and aligns the system for recirculation of the control room air through the redundant trains of HEPA and the charcoal filters. The emergency radiation state also initiates pressurization and filtered ventilation of the air supply to the control room.~~

(continued)

Rev. 0

INSERT 1

The two independent and redundant unit MCR/ESGR EVS trains can actuate automatically in recirculation. One train from the other unit is required for redundancy, and can be manually actuated to provide filtered outside air or to recirculate and filter air approximately 60 minutes after the event.

INSERT 2

the two LCO 3.7.10.a trains of MCR/ESGR EVS actuate to recirculate air, and airflow from the bottled air banks maintains a positive pressure in the MCR/ESGR envelope. The MCR/ESGR envelope consists of the MCR, ESGRs, computer rooms, logic rooms, instrument rack rooms, air conditioning rooms, battery rooms, the MCR toilet, and the stairwell behind the MCR. Approximately 60 minutes after actuation of the MCR/ESGR bottled air system, a single MCR/ESGR EVS train is manually actuated to provide filtered outside air to the MCR/ESGR envelope through HEPA filters and charcoal adsorbers for pressurization.

INSERT 3

Two EVS trains are capable of performing the safety function, one supplying outside filtered air for pressurization, one filtering recirculated air. Two LCO 3.7.10.a trains and one LCO 3.7.10.b train are required for independence and redundancy.

BASES (2)

MCR/ESGR envelope

BACKGROUND (continued)

~~Outside air is filtered, diluted with building air from the electrical equipment and cable spreading rooms, and added to the air being recirculated from the control room.~~ (6) Pressurization of the control room prevents infiltration of unfiltered air from the surrounding areas of the building. envelope (2) ~~The actions taken in the toxic gas isolation state are the same, except that the signal switches control room ventilation to an isolation alignment to prevent outside air from entering the control room.~~ (6)

~~The air entering the control room is continuously monitored by radiation and toxic gas detectors. One detector output above the setpoint will cause actuation of the emergency radiation state or toxic gas isolation state, as required. The actions of the toxic gas isolation state are more restrictive, and will override the actions of the emergency radiation state.~~ (6)

of the MCR/ESGR EVS

MCR/ESGR envelope (2)

A single train will pressurize the control room to about (≥) [0.125] 0.04 inches water gauge. The CREFS operation in maintaining the control room habitable is discussed in the (U)FSAR, Section [6.4] (Ref. 1). MCR/ESGR EHS (1) (2) (1)

Redundant supply and recirculation trains provide the required pressurization and filtration should an excessive pressure drop develop across the other filter train. Normally open closed isolation dampers are arranged in series pairs so that the failure of one damper to shut open will not result in ~~a breach of isolation~~ an inability of the system to perform the function based on the presence of the redundant train. The CREFS MCR/ESGR EHS is designed in accordance with Seismic Category I requirements. (2) (2) (2) (2)

MCR/ESGR EVS

INSERT (7)

The CREFS is designed to maintain the control room environment for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding ~~a 5 rem whole body dose or its equivalent to any part of the body~~ the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19. (Ref. 3) NUREG-0800, section 6.4 (Ref. 4). (2)

APPLICABLE SAFETY ANALYSES

The CREFS MCR/ESGR EVS components are arranged in redundant, safety related ventilation trains. The location of most components and ducting within the control room MCR/ESGR envelope ensures an adequate supply of filtered air to all areas requiring access. The CREFS MCR/ESGR EHS provides airborne radiological protection for the control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis (2) (2)

(continued)

Rev. 0

INSERT

The actuation signal will only start the LCO 3.7.10.a MCR/ESGR EVS trains. Requiring both LCO 3.7.10.a MCR/ESGR EVS trains provides redundancy, assuring that at least one train starts in recirculation when the actuation signal is received.

MCR/ESGR EVS-MODES 1, 2, 3, and 4 CREFS (2)

BASES

APPLICABLE SAFETY ANALYSES (continued)

~~loss of coolant~~ accident, fission product release presented in the UFSAR, Chapter ~~[15]~~ 6 (Ref. 2). (1) (2) (2)

~~The analysis of toxic gas releases demonstrates that the toxicity limits are not exceeded in the control room following a toxic chemical release, as presented in Reference 1.~~ (6)

MCR/ESGR EVS

The worst case single active failure of a component of the ~~CREFS~~, assuming a loss of offsite power, does not impair the ability of the system to perform its design function. (2)

The ~~CREFS~~ satisfies Criterion 3 of ~~the NRC Policy Statement~~. (5)

10 CFR 50.36 (c)(2)(ii)

INSERT 1 (2)

LCO

~~Two independent and redundant CREFS trains are required to be OPERABLE to ensure that at least one is available assuming a single failure disables the other train.~~ Total system failure could result in exceeding ~~a dose of 5 rem to the control room operator~~ in the event of ~~a~~ large radioactive release. (2)

the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 3) and NUREG-0800, Section 6.4 (Ref. 4)

MCR/ESGR EVS - MODES 1, 2, 3, and 4

The ~~CREFS~~ is considered OPERABLE when the individual components necessary to limit operator exposure are OPERABLE ~~in both trains~~. A ~~CREFS~~ train is OPERABLE when the associated: (2) (7) (2)

INSERT 3

n MCR/ESGR EVS

a. Fan is OPERABLE;

b. Demister filters HEPA filters and charcoal adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; and (2)

c. Heater, ~~demister~~, ductwork, valves, and dampers are OPERABLE, and air ~~circulation~~ flow can be maintained. (2) (7)

The MCR/ESGR EVS is shared by Unit 1 and Unit 2.

In addition, the ~~control room~~ MCR/ESGR boundary must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors.

INSERT 2

TSTF-287

APPLICABILITY

In MODES 1, 2, 3, and 4, ~~[5, and 6,]~~ ~~and during movement of irradiated fuel assemblies [and during CORE ALTERATIONS].~~ (6)

<See ITS 3.7.14> (2)

(continued)

Rev. 0

INSERT 1

Two independent and redundant MCR/ESGR EVS trains and one other unit independent and redundant MCR/ESGR EVS train are required to be OPERABLE to ensure that at least one train automatically actuates to filter recirculated air in the MCR/ESGR envelope, and at least one train is available to pressurize and provide filtered air to the MCR/ESGR envelope, assuming a single failure disables one of the two required OPERABLE trains that automatically actuate, or disables the other unit train.

INSERT 2

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

INSERT 3

in the three required trains of the MCR/ESGR EVS-MODES 1, 2, 3, AND 4, which include one other unit train.

 ②

BASES MCR/ESGR EVS

APPLICABILITY (continued)

CREFS must be OPERABLE to control operator exposure during and following a DBA. ②

~~In [MODE 5 or 6], the CREFS is required to cope with the release from the rupture of an outside waste gas tank.~~ ⑥

During movement of irradiated fuel assemblies [and CORE ALTERATIONS], the CREFS must be OPERABLE to cope with the release from a fuel handling accident. See ITS 3.7.14

ACTIONS

A.1 required MCR/ESGR EVS ⑤ are ⑦

required LCO 3.7.10.a or LCO 3.7.10.b MCR/ESGR EVS

When one CREFS train is inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CREFS train is adequate to perform the control room protection function. However, the overall reliability is reduced because a single failure in the OPERABLE CREFS train could result in loss of CREFS function. The 7 day Completion Time is based on the low probability of ~~a DBA occurring~~ during this time period, and ability of the remaining train to provide the required capability. ② MCR/ESGR EVS ②

MCR/ESGR envelope ⑤ ⑤

INSERT TSTF-287

B.1 and B.2 ⓒ or the inoperable MCR/ESGR boundary MCR/ESGR EVS

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

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

[In MODE 5 or 6, or] during movement of irradiated fuel assemblies [, or during CORE ALTERATIONS], if the inoperable CREFS train cannot be restored to OPERABLE status within the required Completion Time, action must be taken to immediately place the OPERABLE CREFS train in the emergency See ITS 3.7.14

(continued)

Rev. 0

INSERT

B.1

If the MCR/ESGR boundary is inoperable in MODE 1, 2, 3, or 4, the MCR/ESGR EVS cannot perform its intended function. Actions must be taken to restore an OPERABLE MCR/ESGR boundary within 24 hours. During the period that the MCR/ESGR 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. 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 MCR/ESGR boundary.

MCR/ESGR EVS - MODES 1, 2, 3 and 4

(2)

BASES

ACTIONS

C.1, C.2.1, and C.2.2 (continued)

mode. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure would be readily detected.

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

Required Action C.1 is modified by a Note indicating to place the system in the toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.

D.1 and D.2

[In MODE 5 or 6, or] during movement of irradiated fuel assemblies [, or during CORE ALTERATIONS], with two CREFS trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the control room. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

See ITS 3.7.14

D ~~E~~.1

MCR/ESGR

for reasons other than an inoperable control room boundary (i.e., Condition B),

two or more required LCO 3.7.10.a or LCO 3.7.10.b MCR/ESGR EVS

EVS

If ~~both CREFS~~ trains are inoperable in MODE 1, 2, 3, or 4, the CREFS 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. TSTF-287 (2) (7) (2)

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on ~~this system~~ are not too severe,

the MCR/ESGR EVS

(continued) (2)

Rev. 0

MCR/ESGR EVS - MODES 1, 2, 3, and 4

CREFS
 (2)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1 (continued) required (3)

Each required train

testing each train once every month provides an adequate check of this system. Monthly heater operations dry 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.] The 31 day Frequency is based on the reliability of the equipment and the two train redundancy availability.

and HEPA filters (11)

(1)

SR 3.7.10.2 (2)

MCR/ESGR EVS

This SR verifies that the required CREFS testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. The CREFS filter tests are in accordance with Regulatory Guide 1.52 (Ref. 3). The [VFTP] includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the [VFTP].

(1) TSTF-362 (1) demister filter (2) (1)

and maximum (10)

SR 3.7.10.3 (7)

LCO 3.7.10.a MCR/ESGR EVS

This SR verifies that each CREFS train starts and operates on an actual or simulated actuation signal. The Frequency of [18] months is specified in Regulatory Guide 1.52 (Ref. 3).

consistent with performing this test on a refueling interval basis. (9)

, by pressurizing the MCR/ESGR envelope, (8)

SR 3.7.10.4

MCR/ESGR EVS

This SR verifies the integrity of the control room enclosure, and the assumed inleakage rates of the potentially contaminated air. The control room positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the CREFS. During the emergency mode of operation, the CREFS is designed to pressurize the control room ≥ [0.125] inches water gauge positive pressure with respect to adjacent areas in order to prevent unfiltered inleakage. The CREFS is designed to maintain this positive pressure

MCR/ESGR envelope (2) (2)

0.04 (1)

MCR/ESGR EVS (2)

(continued)

Rev.0

(2)

BASES

SURVEILLANCE REQUIREMENTS	SR 3.7.10.4 (continued) ≥900 cfm and ≤1100 cfm with one train at a makeup flow rate of [3000] cfm. The Frequency of [18] months on a STAGGERED TEST BASIS is consistent with the guidance provided in NUREG-0800 (Ref. 4). (1)
REFERENCES	1. FSAR, Section [6.4]. (1) 2. FSAR, Chapter [15]. (2) 3. ~~Regulatory Guide 1.52, Rev. 2.~~ (1) 3. 10 CFR 50, Appendix A. (2) 4. NUREG-0800, ~~Section 6.4,~~ Rev. 2, July 1981. (2)

Rev. 0

1. The brackets have been removed and the appropriate plant specific information has been provided.

2. Changes are made (additions, deletions, and/or changes) to the ISTS to reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. Changes are made to reflect those changes made to the Specifications.

4. NAPS uses an MCR/ESGR bottled air system in conjunction with the MCR/ESGR emergency ventilation system to provide the breathing air to the MCR/ESGR envelope. Reference to this system is added as part of the Emergency Habitability System.

5. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36(c)(2)(ii).

6. Discussion of the emergency radiation state and toxic gas isolation state of operation is not adopted. No toxic gas isolation is required by plant analysis, and actuation of the MCR/ESGR EVS in response to a DBA is described in other parts of the Bases.

7. The Bases are modified to reflect certain design aspects of the NAPS MCR/ESGR EVS. The MCR/ESGR EVS is not used during normal unit operations. Each MCR/ESGR EVS train is capable of either recirculating air or providing outside filtered air. There is no actuation signal sent to the other unit MCR/ESGR EVS trains, so they will not start automatically. During an event, at least one train actuates automatically to filter recirculated air, and at least one train is available to provide filtered outside air to the MCR/ESGR envelope for pressurization. The Background, LCO, and Surveillance Requirement sections are modified accordingly.

8. Editorial change made for enhanced clarity or to be consistent with the ISTS Writers Guide.

9. ITS SR 3.7.10.3 verifies that each LCO 3.7.10.a MCR/ESGR EVS train actuates on an actual or simulated actuation signal every 18 months. The justification for the 18 month Frequency is that it is specified in Regulatory Guide 1.52. Regulatory Guide 1.52 addresses filtration requirements. This Surveillance verifies instrumentation and mechanical requirements and the reference is changed to state that the 18 month frequency is consistent with performing the test on a refueling interval basis.

10. The Bases for ITS SR 3.7.10.2 state that the Ventilation Filter Testing Program includes testing minimum flow rate of the activated charcoal. Testing of the maximum flow rate is added to the testing listed to be consistent with the Section 5.0 discussion of the VFTP. The maximum flow rate is an appropriate test criteria because of residence times associated with the activated charcoal.

11. The Bases for ITS SR 3.7.10.1 are modified to state that monthly heater operations dry out moisture in the HEPA filters in addition to the charcoal. Drying out the HEPA filters is also an important result of the surveillance, and is added for clarification.

two air handling units (one for the MCR and one for the ESGR), one chiller in one subsystem and two chillers in the other, valves, piping.

 (2)

/ Emergency Switchgear Room (MCR/ESGR)

Conditioning

B 3.7 PLANT SYSTEMS

B 3.7.11 Main Control Room ~~Emergency~~ Air ~~Temperature Control~~ System (~~CREATCS~~) (2)

BASES

cooling   MCR/ESGR envelope

BACKGROUND

The ~~CREATCS~~ provides ~~temperature control~~ for the ~~control room~~ following isolation of the ~~control room~~. INSERT (2)

MCR/ESGR   subsystems

The ~~CREATCS~~ consists of two independent and redundant ~~trains~~ that provide cooling ~~and heating~~ of ~~recirculated control room~~ air. Each ~~train~~ consists of ~~heating coils, cooling coils~~, instrumentation, and controls to provide for ~~control room temperature control~~. ~~The CREATCS is a subsystem providing air temperature control for the control room.~~ (2) (2) (2)

Subsystem   cooling   MCR/ESGR

MCR/ESGR   subsystem

The ~~CREATCS~~ is an emergency system, parts of which ~~may also~~ operate during normal unit operations. A single ~~train~~ will provide the required ~~temperature control~~ to maintain the ~~control room~~ ~~between [70]°F and [85]°F~~. The ~~CREATCS~~ operation in maintaining the ~~control room~~ temperature is discussed in the ~~F~~SAR, Section ~~[6.4]~~ (Ref. 1). (2) (1) (1) (2)

MCR/ESGR Envelope   within design limits   U   9.4   cooling   MCR/ESGR envelope

within limits

APPLICABLE SAFETY ANALYSES

The design basis of the ~~CREATCS~~ is to maintain the ~~control room~~ temperature ~~for 30 days of continuous occupancy~~. after a DBA (2)

MCR/ESGR   subsystems   MCR/ESGR envelope   within design limits

The ~~CREATCS~~ components are arranged in redundant, safety related ~~trains~~. During emergency operation, the ~~CREATCS~~ maintains the temperature ~~between [70]°F and [85]°F~~. A single active failure of a component of the ~~CREATCS~~, with a loss of offsite power, does not impair the ability of the system to perform its design function. ~~Redundant detectors and controls are provided for control room temperature control.~~ The ~~CREATCS~~ is designed in accordance with Seismic Category I requirements. The ~~CREATCS~~ is capable of removing sensible and latent heat loads from the ~~control room~~, which include consideration of equipment heat loads and personnel occupancy requirements, to ensure equipment OPERABILITY. (2) (2) (2) (2)

MCR/ESGR

The ~~CREATCS~~ satisfies Criterion 3 of ~~the NRC Policy Statement~~. 10 CFR 50.36(c)(2)(ii) (2) (3)

(continued)

Rev. 0

INSERT

The MCR/ESGR ACS also provides cooling for the MCR/ESGR envelope during routine unit operation.

providing cooling to the unit ESGR and associated portion of the MCR,

 (2)

MCR/ESGR

BASES (continued)

subsystems

LCO

Two independent and redundant trains of the CREATCS are required to be OPERABLE to ensure that at least one is available, assuming a single failure disabling the other train. Total system failure could result in the equipment operating temperature exceeding limits in the event of an accident. (2) (2)

Subsystem

cool — required subsystems — MCR/ESGR envelope

The CREATCS is considered to be OPERABLE when the individual components necessary to maintain the control room temperature are OPERABLE in both trains. These components include the heating and cooling coils and associated temperature control instrumentation. In addition, the CREATCS must be operable to the extent that air circulation can be maintained. (2) INSERT 1 (2) (2)

MCR/ESGR

air

and

APPLICABILITY

In MODES 1, 2, 3, 4, [5, ~~and~~ 6,] and during movement of irradiated fuel assemblies [and during CORE ALTERATIONS], the CREATCS must be OPERABLE to ensure that the control room temperature will not exceed equipment operational requirements following isolation of the control room. (1) TSTF-51 (2)

recently

MCR/ESGR envelope

MCR/ESGR

~~[In MODE 5 or 6,] CREATCS may not be required for those facilities that do not require automatic control room isolation.~~ (2)

INSERT 2 TSTF-51 (4) (6)

ACTIONS

required

A.1

Subsystem

INSERT 3

With one CREATCS train inoperable, action must be taken to restore OPERABLE status within 30 days. In this Condition, the remaining OPERABLE CREATCS train is adequate to maintain the control room temperature within limits. However, the overall reliability is reduced because a single failure in the OPERABLE CREATCS train could result in loss of CREATCS function. The 30 day Completion Time is based on the low probability of an event requiring control room isolation, the consideration that the remaining train can provide the required protection, and that alternate safety or nonsafety related cooling means are available. (2) (2) (2)

MCR/ESGR

MCR/ESGR envelope

MCR/ESGR

Subsystem

INSERT 4 (6)

(continued)

Rev. 0

INSERT 1

Each subsystem consists of two air handling units (one for the MCR and one for the ESGR), one chiller, valves, piping, instrumentation and controls. The two subsystems provide air temperature cooling to the portion of the MCR/ESGR envelope associated with the unit. One subsystem has one chiller, the other has two chillers, either of which can be used by that subsystem, but which are not electrically independent from each other.

INSERT 2

The MCR/ESGR ACS 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 a time frame established by analysis. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time), due to radioactive decay.

INSERT 3

and at least 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem available,

INSERT 4

The LCO requires OPERABILITY of a number of independent components. Due to the redundancy of subsystems and the diversity of components, the inoperability of one active component in a subsystem does not render the MCR/ESGR ACS incapable of performing its function. Neither does the inoperability of two different components, each in a different subsystem, necessarily result in a loss of function for the MCR/ESGR ACS (e.g., an inoperable chiller in one subsystem, an inoperable air handler in the other). This allows increased flexibility in unit operations under circumstances when components in opposite subsystems are inoperable.

CREACS MCR/ESGR
B 3.7.11 ②

ACTIONS (continued)

B.1 and B.2

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

C.1, ~~C.2.1,~~ and C.2 ~~.2~~ TSTF-51 ①

~~[In MODE 5 or 6, or]~~ during movement of recently irradiated fuel ~~[, or during CORE ALTERATIONS]~~, if the required inoperable ~~CREACS~~ MCR/ESGR ~~train~~ subsystem cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE ~~CREACS~~ ~~train~~ subsystem must be placed in operation immediately. This action ensures that the remaining ~~train~~ subsystem is OPERABLE, ~~that no failures preventing automatic actuation will occur,~~ and that active failures will be readily detected. ② TSTF-51 ⑤

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~~ MCR/ESGR envelope. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position. ②

D.1 and D.2 TSTF-51 ①

~~[In MODE 5 or 6, or]~~ during movement of recently irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~, ~~with two CREACS trains inoperable~~ INSERT, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the ~~control room~~ MCR/ESGR envelope. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position. TSTF-51 ② ⑥

(continued)

Rev.0

INSERT

with less than 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem available,

 (2)

BASES

ACTIONS (continued) (6)

E.1

INSERT

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

MCR/ESGR envelope (2)

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

any one of (7)

three chillers for the unit

This SR verifies that the heat removal capability of the ~~system~~ is sufficient to remove the heat load assumed in the [safety analyses] in the ~~control room~~. This SR consists of a combination of testing and calculations. The [18] month Frequency is appropriate since significant degradation of the ~~CREATCS~~ is slow and is not expected over this time period. (1) (2)

MCR/ESGR

on a STAGGERED TEST BASIS (7)

REFERENCES

1. (U) FSAR, Section ~~[6.4]~~ 9.4. (1) (2)

Rev. 0

INSERT

With less than 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem available,

1. The brackets are removed and the proper plant specific information/value is provided.

2. Changes are made (additions, deletions, and/or changes) to the ISTS to reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36(c)(2)(ii).

4. Bases changes made by TSTF-51 are incorporated with modifications. These modifications incorporate the concept of the approved changes made by TSTF-51, but the analysis value for the required time has not been determined. When the analysis is completed, the required time with be substituted for the phase, "a time frame established by analysis. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time frame."

5. The phrase, "...that no failure preventing automatic actuation will occur," is deleted from the Bases for ITS 3.7.11 Required Actions C.1 and C.2 because there is no automatic actuation capability for the MCR/ESGR ACS.

6. The Bases for ACTION A.1 are modified to explain that only one MCR/ESGR ACS subsystem is considered inoperable as long as at least 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem is available. The Bases for ACTION D.1 are modified to require movement of recently irradiated fuel assemblies be suspended when less than 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem is available. The Bases for ACTION E.1 are modified to require entering LCO 3.0.3 when less than 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem is available. These descriptions of system requirements are used to explain subsystem inoperabilities instead of the descriptions in ISTS 3.7.11 because the MCR/ESGR ACS at NAPS includes a total of three chillers and flexibility in the use of MCR/ESGR ACS components. This allows a variety of system configurations to be established that would provide sufficient cooling capacity to meet the design function. These modifications allow appropriate flexibility to operation of the system, similar to the descriptions used for ISTS 3.5.2, ECCS – Operating. The Conditions still require that when the design function can not be met, that the appropriate Applicability be exited. This change is consistent with plant design and the intent of ISTS 3.7.11. ACTIONS D.1 and E.1 are new to the current licensing basis.

7. Changes are made to reflect those changes made to the ISTS. The following requirements are renumbered or revised, where applicable, to reflect the changes.

B 3.7 PLANT SYSTEMS

B 3.7.12 Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS)

BASES

BACKGROUND

The ECCS PREACS filters air from the area of the active ECCS components during the recirculation phase of a loss of coolant accident (LOCA). The ECCS PREACS, in conjunction with other normally operating systems, also provides environmental control of temperature and humidity in the ECCS pump room area and the lower reaches of the auxiliary building. (2) (5)

The ECCS PREACS consists of two independent and redundant trains. Each train consists of a heater, a prefilter or demister, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. INSERT 1 INSERT 2 (8) (2) (6) (2)
and
Ductwork, valves or dampers, and instrumentation also form part of the system, as well as demisters functioning to reduce the relative humidity of the air stream. A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case the main HEPA filter bank fails. The downstream HEPA filter is not credited in the accident analysis, but serves to collect charcoal fines, and to back up the upstream HEPA filter should it develop a leak. The system initiates filtered ventilation of the pump room following receipt of a safety injection (SI) signal. (2)
Containment Hi-Hi
Safeguards
from either unit

The ECCS PREACS is a standby system aligned to bypass the system HEPA filters and charcoal adsorbers. During emergency operations, the ECCS PREACS dampers are realigned and fans are started to begin filtration. Upon receipt of the actuating Engineered Safety Feature Actuation System signal(s), normal air discharges from the ECCS pump room isolate, and the stream of ventilation air discharges through the system filter trains. The prefilters remove any large particles in the air, and any entrained water droplets present, to prevent excessive loading of the HEPA filters and charcoal adsorbers. (2) (2) (2)
One Safeguards Area exhaust fan is normally operating and dampers are
Safeguards Area
are diverted
INSERT 3

The ECCS PREACS is discussed in the FSAR, Sections [6.5.1], [9.4.5], and [15.6.5] (Refs. 1, 2, and 3, respectively) since it may be used for normal, as well as post accident, atmospheric cleanup functions. The primary purpose of the (1) (2) (1)
(6)
and

(continued)

Rev.0

INSERT 1

one Safeguards Area exhaust fan, prefilter, and high efficiency particulate air (HEPA) filter and charcoal adsorber assembly for removal of gaseous activity (principally iodines) (shared with the opposite unit), one Auxiliary Building Central exhaust system fan (shared with opposite unit), controls for the Safeguards Area exhaust filter and bypass dampers, and controls for the Auxiliary Building Central exhaust system filter and bypass dampers (shared with the opposite unit).

INSERT 2

The Auxiliary Building filter banks used are shared by the Auxiliary Building General area and Central area potentially contaminated exhaust, fuel building exhaust, decontamination building exhaust, safeguards area exhaust, and containment purge exhaust, and, except for the safeguards area exhaust, are shared with the opposite unit.

INSERT 3

Air discharges from the Auxiliary Building Central exhaust area are manually diverted through the system filter trains. Required Safeguards Area and Auxiliary Building Central area exhaust fans are manually actuated if they are not already operating.

BASES

during normal operations

BACKGROUND (continued)

heaters is to maintain the relative humidity at an acceptable level, consistent with iodine removal efficiencies per Regulatory Guide 1.52 (Ref. ~~4~~). generally 3 , and are not required for post-accident conditions (2)

APPLICABLE SAFETY ANALYSES

The design basis of the ECCS PREACS leakage is established by the large break LOCA. The system evaluation assumes a passive failure of the ECCS outside containment, such as an Safety Injection SI pump seal failure during the recirculation mode. In such a case, the system limits radioactive release to within the 10 CFR 100 (Ref. 5) limits, or the NRC staff approved licensing basis (e.g., a specified fraction of Reference 5 limits). The analysis of the effects and consequences of a large break LOCA is presented in Reference 3. The ECCS PREACS also actuates following a small break LOCA, in those cases where the ECCS goes into the recirculation mode of long term cooling, to clean up releases of smaller leaks, such as from valve stem packing. (9) (2) (2) (2)

control room operator dose limits of 10CFR50, Appendix A, GDC-19 (Ref. 4), and NUREG-0800, Section 6.4

may

Two types of system failures are considered in the accident analysis: complete loss of function, and excessive LEAKAGE. Either type of failure may result in a lower efficiency of removal for any gaseous and particulate activity released to the ECCS pump rooms following a LOCA. (13)

The ECCS PREACS satisfies Criterion 3 of the NRC Policy Statement. 10CFR50.36(c)(2)(ii) (5)

LCO

Two ~~independent and~~ redundant trains of the ECCS PREACS are required to be OPERABLE to ensure that at least one is available, assuming that a single failure disables the other train coincident with loss of offsite power. Total system failure could result in the atmospheric release from the ECCS pump room exceeding 10 CFR 100 limits in the event of a Design Basis Accident (DBA). (8) (8) (2)

exceeding the control room operator dose limits of 10CFR50, Appendix A, GDC-19 (Ref. 4), and NUREG-0800, Section 6.4 (Ref. 5)

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

An ECCS PREACS train is considered OPERABLE when its associated:

(continued)

Rev. 0

BASES INSERT 4 4

LCO (continued)

a. ~~Fan is OPERABLE;~~ Insert 1 2

e b. HEPA filter and charcoal adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; and

f c. ~~Heater, demister,~~ ductwork, valves, and dampers are OPERABLE ~~and air circulation can be maintained~~. 2

INSERT 2 TSTF-287 4

APPLICABILITY

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

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

ACTIONS

A.1

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

The 7 day Completion Time is appropriate because the risk contribution is less than that for the ECCS (72 hour Completion Time), and this system is not a direct support system for the ECCS. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability. 2

Design Basis Accident (DBA)

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

INSERT 3 TSTF-287

C
B.1 and B.2

or ECCS pump room boundary

If the ECCS PREACS train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least

(continued)

Rev. 0

INSERT 1

a. Safeguards Area exhaust fan is OPERABLE;
b. One Auxiliary Building HEPA filter and charcoal adsorber assembly (shared with the opposite unit) is OPERABLE;
c. One Auxiliary Building Central exhaust system fan (shared with opposite unit) is OPERABLE;
d. Controls for the Auxiliary Building Central exhaust system filter and bypass dampers (shared with the opposite unit) are OPERABLE;

INSERT 2

The LCO is modified by a Note allowing the ECCS pump room boundary openings not open by design to be opened intermittently under administrative controls. For entry and exit through doors the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls consist of stationing a dedicated individual at the opening who is in continuous communication with the control room. This individual will have a method to rapidly close the opening when a need for ECCS pump room isolation is indicated.

INSERT 3

B.1

If the ECCS pump room boundary is inoperable, the ECCS PREACS trains cannot perform their intended functions. Actions must be taken to restore an OPERABLE ECCS pump room boundary within 24 hours. During the period that the ECCS pump 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. Preplanned measures should be available to address these concerns for intentional and unintentional entry into the condition. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of compensatory measures. The 24 hour Completion Time is a typically reasonable time to diagnose, plan and possibly repair, and test most problems with the ECCS pump room boundary.

INSERT 4

In addition, the required Safeguards Area and charging pump cubicle boundaries for charging pumps not isolated from the RCS must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors, except for those openings which are left open by design, including charging pump cubicle ladder wells.

BASES

TSTF-287

ACTIONS

C.1 and C.2 (continued)

MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train once a month provides an adequate check on this system. Monthly heater operations dry out any moisture that may have accumulated in the charcoal from humidity in the ambient air. [Systems with heaters must be operated ≥ 10 continuous hours with the heaters energized. Systems without heaters need only be operated for ≥ 15 minutes to demonstrate the function of the system.] The 31 day Frequency is based on the known reliability of equipment and the two train redundancy available.

The system

and HEPA filters 12

1

INSERT

3

3

SR 3.7.12.2 3

This SR verifies that the required ECCS PREACS testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. The ECCS PREACS filter tests are in accordance with Reference 4. The [VFTP] includes testing HEPA filter performance, charcoal adsorbers 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].

and maximum

1 7 6 1 10 1

SR 3.7.12.3 4

diverts its exhaust flow through the filters

3 2

This SR verifies that each ECCS PREACS train starts and operates on an actual or simulated actuation signal. The [18] month Frequency is consistent with that specified in Reference 4. 3

1 2

(continued)

Rev. 0

INSERT

SR 3.7.12.2

This SR verifies that Safeguards Area exhaust flow and Auxiliary Building Central exhaust system flow, when actuated from the control room, diverts flow through the Auxiliary Building HEPA filter and charcoal adsorber assembly for the operating train. Exhaust flow is diverted manually through the filters in case of a DBA requiring their use. The 31 day Frequency is based on the known reliability of equipment and the two train redundancy available.

each train of

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.12.~~4~~ 5

This SR verifies the integrity of the ECCS pump room enclosure. The ability of the ECCS pump room to maintain a negative pressure, with respect to potentially uncontaminated adjacent areas, is periodically tested to verify proper functioning of the ECCS PREACS. During the [post accident] mode of operation, the ECCS PREACS is designed to maintain a slight negative pressure in the ECCS pump room, with respect to adjacent areas, to prevent unfiltered LEAKAGE. The ECCS PREACS is designed to maintain a ≤ [-0.125] ~~inches water gauge~~ relative to atmospheric pressure ~~at a flow rate of [3000] cfm from the ECCS pump room~~. The Frequency of [18] months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. ~~6~~ 5).

in a qualitative manner

negative pressure

adjacent areas

This test is conducted with the tests for filter penetration; thus, an [18] month Frequency on a STAGGERED TEST BASIS is consistent with that specified in Reference ~~4~~ 3.

~~SR 3.7.12.5~~

~~Operating the ECCS PREACS bypass damper is necessary to ensure that the system functions properly. The OPERABILITY of the ECCS PREACS bypass damper is verified if it can be specified in Reference 4.~~

REFERENCES

1. ~~FSAR, Section [6.5.1].~~
~~2~~ 1. FSAR, Section [9.4.~~5~~ 6].
~~3~~ 2. FSAR, Section [15.~~6.5~~ 4].
~~4~~ 3. Regulatory Guide 1.52 (Rev. 2).
~~5~~ 4. ~~10 CFR 100.11~~ 10 CFR 50, Appendix A.
~~6~~ 5. NUREG-0800, ~~Section 6.5.1~~, Rev. 2, July 1981.

Rev. 0

3

B 3.7 PLANT SYSTEMS

B 3.7.14 Penetration Room Exhaust Air Cleanup System (PREACS)

BASES

BACKGROUND

The PREACS filters air from the penetration area between containment and the auxiliary building.

The PREACS consists of two independent and redundant trains. Each train consists of a heater, a prefilter or demister, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, valves or dampers, and instrumentation, as well as demisters, functioning to reduce the relative humidity of the air stream, also form part of the system. A second bank of HEPA filters, which follows the adsorber section, collects carbon fines and provides backup in case of failure of the main HEPA filter bank. The downstream HEPA filter, although not credited in the accident analysis, collects charcoal fines and serves as a backup should the upstream HEPA filter develop a leak. The system initiates filtered ventilation following receipt of a safety injection signal.

The PREACS is a standby system, parts of which may also operate during normal unit operations. During emergency operations, the PREACS dampers are realigned and fans are started to initiate filtration. Upon receipt of the actuating signal(s), normal air discharges from the penetration room, the penetration room is isolated, and the stream of ventilation air discharges through the system filter trains. The prefilters remove any large particles in the air, as well as any entrained water droplets, to prevent excessive loading of the HEPA filters and charcoal adsorbers.

The PREACS is discussed in the FSAR, Sections [6.5.1], [9.4.5], and [15.6.5] (Refs. 1, 2, and 3, respectively) since it may be used for normal, as well as post accident, atmospheric cleanup functions. Heaters may be included for moisture removal on systems operating in high humidity conditions. The primary purpose of the heaters is to maintain the relative humidity at an acceptable level consistent with iodine removal efficiencies per Regulatory Guide 1.52 (Ref. 4).

(continued)

Rev. 0

3

BASES (continued)

APPLICABLE SAFETY ANALYSES

The PREACS design basis is established by the large break loss of coolant accident (LOCA). The system evaluation assumes a passive failure outside containment, such as valve packing leakage during a Design Basis Accident (DBA). In such a case, the system restricts the radioactive release to within the 10 CFR 100 (Ref. 4) limits, or the NRC staff approved licensing basis (e.g., a specified fraction of 10 CFR 100 limits). The analysis of the effects and consequences of a large break LOCA are presented in Reference 3.

Two types of system failures are considered in the accident analysis: a complete loss of function, and excessive LEAKAGE. Either type of failure may result in less efficient removal of any gaseous or particulate material released to the penetration room following a LOCA.

The PREACS satisfies Criterion 3 of the NRC Policy Statement.

LCO

Two independent and redundant trains of the PREACS are required to be OPERABLE to ensure that at least one train is available, assuming there is a single failure disabling the other train coincident with a loss of offsite power.

The PREACS is considered OPERABLE when the individual components necessary to control radioactive releases are OPERABLE in both trains. A PREACS train is considered OPERABLE when its associated:

a. Fan is OPERABLE;

b. HEPA filter and charcoal adsorber are not excessively restricting flow, and are capable of performing their filtration functions; and

c. Heater, demister, ductwork, valves, and dampers are OPERABLE and air circulation can be maintained.

INSERT LCO NOTE BASES

TSTF-287

APPLICABILITY

In MODES 1, 2, 3, and 4, the PREACS is required to be OPERABLE, consistent with the OPERABILITY requirements of the Emergency Core Cooling System (ECCS).

(continued)

Rev.0

BASES

APPLICABILITY (continued)

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

ACTIONS

A.1

With one PREACS train inoperable, the action must be taken to restore OPERABLE status within 7 days. During this period, the remaining OPERABLE train is adequate to perform the PREACS function. The 7 day Completion Time is appropriate because the risk contribution of the PREACS is less than that of the ECCS (72 hour Completion Time), and this system is not a direct support system for the ECCS. The 7 day Completion Time is based on the low probability of a DBA occurring during this period, and the remaining train providing the required capability.

INSERT 4

TSTF-287

C

~~B~~.1 and ~~B~~.2

or penetration room boundary

If the inoperable train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The 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 3.7.14.1

Standby systems should be checked periodically to ensure that they function properly. As the environmental and normal operating conditions on this system are not severe, testing each train once every month provides an adequate check on this system. Monthly heater operation dries out any moisture that may have 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.] The 31 day Frequency is based on the known

(continued)

Rev.0

3

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.14.1 (continued)

reliability of equipment and the two train redundancy available.

SR 3.7.14.2

This SR verifies that the required PREACS testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. The PREACS filter tests are in accordance with Regulatory Guide 1.52 (Ref. 5). 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 3.7.14.3

This SR verifies that each PREACS starts and operates on an actual or simulated actuation signal. The [18] month Frequency is consistent with that specified in Reference 5.]

[SR 3.7.14.4

This SR verifies the integrity of the penetration room enclosure. The ability of the penetration room to maintain a negative pressure, with respect to potentially uncontaminated adjacent areas, is periodically tested to verify proper function of PREACS. During the [post accident] mode of operation, the PREACS is designed to maintain a ≤ [-0.125] inches water gauge relative to atmospheric pressure at a flow rate of [3000] cfm in the penetration room, with respect to adjacent areas, to prevent unfiltered LEAKAGE. The Frequency of [18] months is consistent with the guidance provided in NUREG-0800 (Ref. 6).

The minimum system flow rate maintains a slight negative pressure in the penetration room area, and provides sufficient air velocity to transport particulate]

(continued)

Rev.0

3

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.14.4 (continued)

contaminants, assuming only one filter train is operating. The number of filter elements is selected to limit the flow rate through any individual element to about [3000] cfm. This may vary based on filter housing geometry. The maximum limit ensures that the flow through, and pressure drop across, each filter element are not excessive.

The number and depth of the adsorber elements ensure that, at the maximum flow rate, the residence time of the air stream in the charcoal bed achieves the desired adsorption rate. At least a [0.125] second residence time is necessary for an assumed [99]% efficiency.

The filters have a certain pressure drop at the design flow rate when clean. The magnitude of the pressure drop indicates acceptable performance, and is based on manufacturers' recommendations for the filter and adsorber elements at the design flow rate. An increase in pressure drop or a decrease in flow indicates that the filter is being loaded or that there are other problems with the system.

This test is conducted along with the tests for filter penetration; thus, the [18] month Frequency is consistent with that specified in Reference 5.

SR 3.7.14.5

It is necessary to operate the PREACS filter bypass damper to ensure that the system functions properly. The OPERABILITY of the PREACS filter bypass damper is verified if it can be closed. An [18] month Frequency is consistent with that specified in Reference 5.

REFERENCES

1. FSAR, Section [6.5.1].

2. FSAR, Section [9.4.5].

3. FSAR, Section [15.6.5].

4. 10 CFR 100.

(continued)

Rev 0

3

BASES

REFERENCES (continued)

5. Regulatory Guide 1.52, Rev. 2.
6. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.

Rev.0

1. The brackets have been removed and the appropriate plant specific information has been provided.

2. Changes are made (additions, deletions, and/or changes) to the ISTS to reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. Changes are made to reflect those changes made to the ISTS. The following requirements are renumbered or revised, where applicable, to reflect the changes.

4. Changes to the ISTS resulting from TSTF-287 are modified. The TSTF-287 changes address maintenance of the area boundary to provide assurance a negative pressure can be maintained in case of an accident. The ECCS PREACS boundary for the charging pump cubicles associated with the Auxiliary Building Central area exhaust fans are enclosed, but do not form an entire pressure boundary because they include openings left open by design during accident conditions. The TSTF 287 LCO NOTE Bases are modified to reflect this plant design.

5. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36(c)(2)(ii).

6. A statement is added to clarify that the filters used by five ventilation systems, including two required by the Technical Specifications, are shared.

7. The phrase in the ISTS SR 3.7.12.2 Bases, "The ECCS PREACS filter tests are in accordance with reference 4" is not adopted. This change is consistent with TSTF-362, which changes the Ventilation Filter Testing Program in accordance with Generic Letter 99-02. The deletion of this phrase was inadvertently omitted as part of TSTF-362.

8. The reference to the ECCS PREACS being independent and able to withstand a single failure is deleted because the trains are linked by a common ductwork system in which some dampers are not single failure proof. The operating equipment for the two ECCS PREACS trains is independent, and the trains can be considered redundant, but stating that the system as a whole is independent and single failure proof is inaccurate.

9. The reference to an assumption of a passive failure of the ECCS outside containment is changed to assumed ECCS leakage outside containment. As described in the Standard Review Plan, DBA analysis assumes leakage from ECCS outside containment based on the fact that ventilation from those spaces is filtered.

10. Testing of the maximum flow rate is added to the testing of the activated charcoal listed in the Bases for ITS SR 3.7.12.3 as part of the Ventilation Filter Testing Program. Adding the maximum flow rate is consistent with the Section 5.0 discussion of the VFTP. The maximum flow rate is an appropriate test criteria because of residence times associated with the activated charcoal.

11. ISTS SR 3.7.12.4 Bases are modified to state that the surveillance is performed in a qualitative manner. ISTS SR 3.7.12.4 is modified to require one ECCS PREACS train maintain a negative pressure relative to atmospheric pressure during post accident mode of operation, and does not specify a specific pressure or flow rate. The Safeguards Area and Auxiliary Building Central exhaust area are not maintained at a specific negative pressure due to the design of these areas. Also, a specific negative pressure is not assumed as part of the DBA analysis, and the ECCS PREACS flow rate is verified as part of the Ventilation Filter Testing Program.

12. The Bases for ITS SR 3.7.12.1 are modified to state that monthly heater operations dry out moisture in the HEPA filters in addition to the charcoal. Drying out the HEPA filters is also an important result of the surveillance, and is added for clarification.

13. A discussion in the Applicable Safety Analyses section system regarding failures considered in the accident analysis is deleted. The discussion concerns a complete loss of function and excessive LEAKAGE, two assumptions which are actually beyond the analysis. The analysis assumes LEAKAGE within assumed limits, and that at least one train of the system functions. This paragraph is not consistent with DBA analysis.\

(2)

/ Emergency Switchgear Room (MCR/ESGR) Bottled Air

Main

B 3.7 PLANT SYSTEMS

B 3.7.~~10~~ 13 Control Room ~~Emergency Filtration~~ System ~~(CREFS)~~

The MCR/ESGR EHS consists of the MCR/ESGR bottled air system (LCO 3.7.13) and the MCR/ESGR Emergency Ventilation System (EVS) (LCO 3.7.10 and LCO 3.7.14).

(2)

BASES MCR/ESGR Emergency Habitability System (EHS)

BACKGROUND The ~~CREFS~~ provides a protected environment from which operators can control the unit following an uncontrolled release of radioactivity~~[, chemicals, or toxic gas]~~. (8)

INSERT 1 (4)

~~The CREFS consists of two independent, redundant trains that recirculate and filter the control room air. Each train consists of a prefilter or demister, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, valves or dampers, and instrumentation also form part of the system, as well as demisters to remove water droplets from the air stream. A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case of failure of the main HEPA filter bank.~~ See ITS 3.7.10 See ITS 3.7.14

In MODES 1, 2, 3, or 4,

MCR/ESGR envelope

~~The CREFS is an emergency system, parts of which may also operate during normal unit operations in the standby mode of operation.~~ Upon receipt of the actuating signal(s), normal air supply to and exhaust from the ~~control room~~ is isolated, ~~and the stream of ventilation air is recirculated through the system filter trains. The prefilters or demisters remove any large particles in the air, and any entrained water droplets present, to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 10 hours per month, with the heaters on, reduces moisture buildup on the HEPA filters and adsorbers. Both the demister and heater are important to the effectiveness of the charcoal adsorbers.~~ (7) (2) (7)

INSERT 2

See ITS 3.7.10 See ITS 3.7.14

~~Actuation of the CREFS places the system in either of two separate states (emergency radiation state or toxic gas isolation state) of the emergency mode of operation, depending on the initiation signal. Actuation of the system to the emergency radiation state of the emergency mode of operation, closes the unfiltered outside air intake and unfiltered exhaust dampers, and aligns the system for recirculation of the control room air through the redundant trains of HEPA and the charcoal filters. The emergency radiation state also initiates pressurization and filtered ventilation of the air supply to the control room.~~ (8)

(continued)

Rev. 0

INSERT 1

The MCR/ESGR bottled air system consists of four trains of bottled air lined up to provide air to the MCR/ESGR envelope when the system actuates. The air is provided via four trains which feed a common header, supplying air to the Unit 1 and Unit 2 ESGRs. The header is also capable of being aligned to supply air directly to the MCR. Each train is provided air by one of the bottled air banks. Unit 1 and Unit 2 each provide two trains of bottled air. Two bottled air trains are capable of providing dry air of breathing quality to maintain a positive interior pressure in the MCR/ESGR envelope for Unit 1 and Unit 2 for a period of one hour following a Design Basis Accident (DBA).

INSERT 2

the two LCO 3.7.10.a trains of MCR/ESGR EVS actuate to recirculate air, and airflow from the bottled air banks maintains a positive pressure in the MCR/ESGR envelope. In case of a Fuel Handling Accident (FHA) during movement of recently irradiated fuel, automatic actuation of bottled air is not required, and no train of MCR/ESGR EVS is required to recirculate air. The MCR/ESGR envelope consists of the MCR, ESGRs, computer rooms, logic rooms, instrument rack rooms, air conditioning rooms, battery rooms, the MCR toilet, and the stairwell behind the MCR. Approximately 60 minutes after actuation of the MCR/ESGR bottled air system, a single MCR/ESGR EVS train is manually actuated to provide filtered outside air to the MCR/ESGR envelope through high efficiency particulate air (HEPA) filters and charcoal adsorbers for pressurization.

MCR/ESGR Bottled Air System

4

BASES

MCR/ESGR envelope

2

BACKGROUND (continued)

~~Outside air is filtered, diluted with building air from the electrical equipment and cable spreading rooms, and added to the air being recirculated from the control room.~~ 8

Pressurization of the ~~control room~~ MCR/ESGR envelope prevents infiltration of unfiltered air from the surrounding areas of the ~~building~~ envelope. 2

~~The actions taken in the toxic gas isolation state are the same, except that the signal switches control room ventilation to an isolation alignment to prevent outside air from entering the control room.~~ 8

~~The air entering the control room is continuously monitored by radiation and toxic gas detectors. One detector output above the setpoint will cause actuation of the emergency radiation state or toxic gas isolation state, as required. The actions of the toxic gas isolation state are more restrictive, and will override the actions of the emergency radiation state.~~ 8

Two trains of the MCR/ESGR bottled air system

~~A single train~~ will pressurize the ~~control room~~ MCR/ESGR envelope to ~~about~~ ~~[0.125]~~ ≥ 0.05 inches water gauge. The ~~CREFS~~ MCR/ESGR EHS operation in maintaining the ~~control room~~ MCR/ESGR envelope habitable ~~is discussed in the~~ U FSAR, Section ~~[~~6.4~~]~~ 2 (Ref. 1). 4 1 4 2 1

~~Redundant supply and recirculation trains provide the required filtration should an excessive pressure drop develop across the other filter train. Normally open isolation dampers are arranged in series pairs so that the failure of one damper to shut will not result in a breach of isolation. The CREFS is designed in accordance with Seismic Category I requirements.~~ <See ITS 3.7.10> <See ITS 3.7.14>

MCR/ESGR EHS

MCR/ESGR envelope

The ~~CREFS~~ MCR/ESGR EHS is designed to maintain the ~~control room~~ MCR/ESGR envelope environment for 30 days of continuous occupancy after a ~~Design Basis Accident (DBA) without exceeding a 5 rem whole body dose or its equivalent to any part of the body.~~ the control room operator dose limits of 10CFR50, Appendix A, GDC-19 (Ref. 2), and NUREG-0800, Section 6.4 (Ref. 3). 2 2

INSERT 4

APPLICABLE SAFETY ANALYSES

~~The CREFS components are arranged in redundant, safety related ventilation trains. The location of components and ducting within the control room envelope ensures an adequate supply of filtered air to all areas requiring access.~~ <See ITS 3.7.10> <See ITS 3.7.14>

The ~~CREFS~~ MCR/ESGR EHS provides airborne radiological protection for the control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis 2

(continued)

2

Rev. 0

INSERT

The MCR/ESGR bottled air system is arranged in redundant, safety related trains providing pressurized air from the required bottled air banks to maintain a habitable environment in the MCR/ESGR envelope.

BASES

APPLICABLE SAFETY ANALYSES (continued)

~~loss of coolant~~ accident, fission product release presented in the UFSAR, Chapter ~~[15]~~ (Ref. ~~2~~ 4). (2) (1)(2)

~~The analysis of toxic gas releases demonstrates that the toxicity limits are not exceeded in the control room following a toxic chemical release, as presented in Reference 1.~~ (8)

The worst case single active failure of a component of the ~~CREFS~~ MCR/ESGR bottled air system, assuming a loss of offsite power, does not impair the ability of the system to perform its design function.

The ~~CREFS~~ satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii). (5)

LCO

~~Two~~ Three independent and redundant ~~CREFS~~ trains are required ~~to be OPERABLE~~ to ensure that at least ~~one is~~ two are available one assuming a single failure disables ~~the other~~ train. Total system failure could result in exceeding ~~a dose of 5 rem to the control room operator~~ the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 2), and NUREG-0800, Section 6.4 (Ref. 3) in the event of a large radioactive release. (4)

The ~~CREFS~~ MCR/ESGR bottled air system is considered OPERABLE when the individual components necessary to limit operator exposure are OPERABLE in ~~both~~ the three required trains of the MCR/ESGR bottled air system. ~~A CREFS train is OPERABLE when the associated:~~ (2)

INSERT 1 (4)

~~a. Fan is OPERABLE;~~

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

~~c. Heater, demister, ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained.~~

In addition, the ~~control room~~ MCR/ESGR boundary must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors. (2)

INSERT 2 TSTF-287

APPLICABILITY

In MODES 1, 2, 3, and 4, ~~[5, and 6,]~~ and during movement of recently irradiated fuel assemblies ~~[and during CORE ALTERATIONS]~~. (1) TSTF-51

(continued) (2)

Rev. 0

INSERT 1

A MCR/ESGR bottled air system train is OPERABLE when:

a. One OPERABLE bottled air bank of 51 bottles is in service;
b. A flow path, including associated valves and piping, is OPERABLE; and
c. The common exhaust header is OPERABLE.

The MCR/ESGR bottled air system trains are shared by Unit 1 and Unit 2.

INSERT 2

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

BASES

APPLICABILITY (continued)

CREFS must be OPERABLE to control operator exposure during and following a DBA.

~~In [MODE 5 or 6], the CREFS is required to cope with the release from the rupture of an outside waste gas tank.~~ (8)

During movement of recently irradiated fuel assemblies ~~[and CORE ALTERATIONS]~~, the CREFS must be OPERABLE to ~~cope with~~ respond to the release from a fuel handling accident involving handling recently irradiated fuel. INSERT 4 TSTF-51 (2) TSTF-51 (6)

ACTIONS

A.1

required MCR/ESGR bottled air system (4)

When one required CREFS train is inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining OPERABLE ~~CREFS train is~~ MCR/ESGR bottled air system trains are adequate to perform the ~~control room~~ MCR/ESGR envelope protection function. However, the overall reliability is reduced because a single failure in ~~the OPERABLE CREFS train~~ One of the remaining required OPERABLE trains could result in loss of CREFS function. The 7 day Completion Time is based on the low probability of a DBA occurring this time period, and ability of the remaining trains to provide the required capability. (4) (2)

the MCR/ESGR bottled air system (4)

~~B~~ C D .1 and ~~B~~ .2

INSERT 1 TSTF 287

INSERT 2 (2) (4)

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

(4)

E ~~D~~ ~~C~~.1, ~~C.2.1,~~ and ~~C~~.2.~~2~~ TSTF-287

~~[In MODE 5 or 6, or]~~ during movement of recently irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~, if the required inoperable MCR/ESGR bottled air system ~~CREFS~~ train cannot be restored to OPERABLE status within the required Completion Time, or two or more required MCR/ESGR bottled air system trains are inoperable, action must be taken to immediately ~~place the OPERABLE CREFS train in the emergency~~ (3) TSTF-51 (4) (4) (4)

(continued)

Rev. 0

INSERT 1

B.1

If the MCR/ESGR boundary is inoperable in MODE 1, 2, 3, or 4, the MCR/ESGR bottled air system cannot perform its intended function. Actions must be taken to restore an OPERABLE MCR/ESGR boundary within 24 hours. During the period that the MCR/ESGR 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. 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 MCR/ESGR boundary.

INSERT 2

C.1

When two or more required trains of the MCR/ESGR bottled air system are inoperable in MODE 1, 2, 3, or 4 for reasons other than an inoperable MCR/ESGR boundary (i.e., Condition B), action must be taken to restore at least two of the required MCR/ESGR bottled air system trains to OPERABLE status within 24 hours. During the period that two or more required trains of the MCR/ESGR bottled air system are 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. 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, restore, and possibly repair, and test most problems with the MCR/ESGR bottled air system, such as repressurizing the system after an inadvertent actuation.

INSERT 3

required MCR/ESGR bottled air system trains or the inoperable MCR/ESGR boundary

INSERT 4

The MCR/ESGR bottled air 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 a time frame established by analysis. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time), due to radioactive decay.

MCR/ESGR Bottled Air System

(4)

BASES

(4)
TSTF-287

ACTIONS

~~C~~.1 ~~C.2.1~~ and ~~C~~.2.~~2~~ (continued) D E

TSTF-51

~~mode. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure would be readily detected.~~ (4)

An alternative to Required Action ~~C~~.1 is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position. D TSTF-287 (2)

MCR/ESGR envelope

~~Required Action C.1 is modified by a Note indicating to place the system in the toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable.~~ D TSTF-287 (8)

~~D.1 and D.2~~ E

~~[In MODE 5 or 6, or] during movement of irradiated fuel assemblies [, or during CORE ALTERATIONS], with two CREFS trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the control room. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.~~ TSTF-287 TSTF-51 (4)

E.1

If both CREFS trains are inoperable in MODE 1, 2, 3, or 4, the CREFS 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. See ITS 3.7.10

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1 See ITS 3.7.10

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not too severe, See ITS 3.7.14

(continued)

Rev. 0

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1 (continued)

testing each train once every month provides an adequate check of this system. Monthly heater operations dry 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.] The 31 day Frequency is based on the reliability of the equipment and the two train redundancy availability.

See ITS 3.7.10

SR 3.7.10.2

This SR verifies that the required CREFS testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. The CREFS filter tests are in accordance with Regulatory Guide 1.52 (Ref. 3). The [VFTP] includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the [VFTP].

See ITS 3.7.14

INSERT

SR 3.7.~~10~~13.3

each required MCR/ESGR bottled air system train actuates ④

This SR verifies that each ~~CREFS train starts and operates~~ by verifying the flow path is opened on an actual or simulated ~~actuation signal. The Frequency~~ of ~~[18]~~ months is ~~specified in Regulatory Guide 1.52 (Ref. 3)~~. ② consistent with performing this test on a refueling interval basis ⑩ ⑨

SR 3.7.~~10~~13.4 ④

This SR verifies, by pressurizing the MCR/ESGR envelope, the integrity of the ~~control room enclosure~~ MCR/ESGR envelope, and the assumed inleakage rates of the potentially contaminated air. The ~~control room~~ positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the ~~CREFS~~ MCR/ESGR bottled air system. During the emergency mode of operation, the ~~CREFS~~ is designed to pressurize the ~~control room~~ ≥ ~~[0.125]~~ 0.05 inches water gauge positive pressure with respect to adjacent areas in order to prevent unfiltered inleakage. The ~~CREFS~~ is designed to maintain this positive pressure ② ② ①

(continued)

Rev. 0

INSERT

SR 3.7.13.1

This SR verifies that each required MCR/ESGR bottled air bank is at the proper pressure. This ensures that when combined with the required number of OPERABLE air bottles, the minimum required air flow will be maintained to ensure the required MCR/ESGR envelope pressurization for approximately 60 minutes when the MCR/ESGR bottled air system is actuated.

SR 3.7.13.2

This SR verifies that the proper number of MCR/ESGR air bottles are in service, with one bank of 51 air bottles in each required train. This SR requires verification that each bottled air bank manual valve not locked, sealed, or otherwise secured and required to be open during accident conditions is open. This SR helps to ensure that the bottled air banks required to be OPERABLE to pressurize the MCR/ESGR boundary are in service. The 31 day Frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions. This SR does not apply to valves that are locked, sealed, or otherwise secured in the open position, since these were verified to be in the correct position prior to locking, sealing, or securing.

MCR/ESGR Bottled Air System

4

BASES

SURVEILLANCE REQUIREMENTS	SR 3.7.~~10~~ 13.4 (continued)
	with ~~one~~ two train at a makeup flow rate of ~~[3000]~~ 340 cfm. Testing two trains at a time at The Frequency of ~~[18]~~ months on a STAGGERED TEST BASIS is consistent with the guidance provided in NUREG-0800 (Ref. ~~4~~ 3).

4

REFERENCES

1. FSAR, Section ~~[6.4]~~.
2. 10 CFR 50, Appendix A.
~~2.~~ 4. FSAR, Chapter ~~[15]~~.
~~3. Regulatory Guide 1.52, Rev. 2.~~
~~4.~~ 3. NUREG-0800, ~~Section 6.4~~ Rev. 2, July 1981.

1 2 1 4

Rev 0

1. The brackets have been removed and the appropriate plant specific information has been provided.

2. Changes are made (additions, deletions, and/or changes) to the ISTS to reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. Changes are made to reflect those changes made to the Specifications.

4. NAPS uses an MCR/ESGR bottled air system in conjunction with the MCR/ESGR emergency ventilation system to provide the breathable air to the MCR/ESGR envelope. The LCO is modified to require three MCR/ESGR bottled air system trains. The Bases explain that one bottled air bank provides air to each MCR/ESGR bottled air system train. Each train consists of one bottled air bank, piping, valves, and control systems that provide the air from the air bottles to the MCR/ESGR envelope. Condition A is modified to allow one MCR/ESGR bottled air system train to be inoperable for 7 days. The Condition for inoperable MCR/ESGR EVS trains due to an inoperable MCR/ESGR boundary is modified to also address the resulting inoperability of three required MCR/ESGR bottled air system trains. ISTS Conditions C and D, addressing the Applicability during movement of recently irradiated fuel assemblies, are modified. The first modification is for the Condition to address two or more required inoperable MCR/ESGR bottled air system trains. The second modification deletes the option of placing the OPERABLE ISTS CREFS train in emergency mode when one ISTS CREFS train is inoperable and is not restored to OPERABLE status within 7 days. The intent of this action is to put the portion of the system that can perform the safety function in service. The NAPS design places one train of MCR/ESGR EVS in recirculation when bottled air is actuated, and then places a second train in operation to provide filtered outside air after approximately 60 minutes. During the first 60 minutes, the MCR/ESGR bottled air system is in operation depleting the air in the bottled air system, and one train of MCR/ESGR is in recirculation. Thus, placing one train of the MCR/ESGR emergency ventilation system in recirculation and the MCR/ESGR bottled air system in operation when a train of either is inoperable impedes the capability to perform the safety function, rather than ensuring it, and this option is not adopted.

5. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36(c)(2)(ii).

6. Bases changes made by TSTF-51 are incorporated with modifications. These modifications incorporate the concept of the approved changes made by TSTF-51, but the analysis value for the required time has not been determined. When the analysis is completed, the required time with be substituted for the phase, "a time frame established by analysis. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time frame."

7. The Bases are modified to reflect certain design aspects of the NAPS MCR/ESGR EVS. The MCR/ESGR EVS is not used during normal unit operations. Each MCR/ESGR EVS train is capable of either recirculating air or providing outside filtered air. There is no actuation signal sent to the other unit MCR/ESGR EVS trains, so they will not start automatically. During an event, at least one train actuates automatically to filter recirculated air, and at least one train is available to provide filtered outside air to the MCR/ESGR envelope. The Background, LCO, and Surveillance Requirement sections are modified accordingly.

8. Discussion of the emergency radiation state and toxic gas isolation state of operation is not adopted. No toxic gas isolation is required by plant analysis, and actuation of the MCR/ESGR bottled air system in response to a DBA is described in other parts of the Bases.

9. Editorial change made for enhanced clarity or to be consistent with the ISTS Writers Guide.

10. ITS SR 3.7.13.3 verifies that each required MCR/ESGR bottled air system train actuates on an actual or simulated actuation signal every 18 months. The justification for the 18 month Frequency is that it is specified in Regulatory Guide 1.52. Regulatory Guide 1.52 addresses filtration requirements. This Surveillance verifies instrumentation and mechanical requirements and the reference is changed to state that the 18 month frequency is consistent with performing the test on a refueling interval basis.

2

2

Main / Emergency Switchgear Room (MCR/ESGR)

B 3.7 PLANT SYSTEMS

Ventilation EVS

14 B 3.7.~~10~~ Control Room Emergency ~~Filtration~~ System (~~CREFS~~) - During Movement of Recently Irradiated Fuel Assemblies

MCR/ESGR Emergency Habitability System (EHS)

BASES

BACKGROUND

MCR/ESGR EVS

The MCR/ESGR EHS consists of the MCR/ESGR bottled air system (LCO 3.7.13) and the MCR/ESGR EVS (LCO 3.7.10 and LCO 3.7.14).

The ~~CREFS~~ provides a protected environment from which operators can control the unit following an uncontrolled release of radioactivity ~~[, chemicals, or toxic gas]~~. 2 8

The ~~CREFS~~ consists of ~~two~~ four independent, redundant trains that ~~recirculate and filter the control room air~~. Each train consists of ~~a prefilter or demister, a~~ high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, valves ~~or~~ and dampers, and instrumentation also form part of the system~~, as well as demisters to remove water droplets from the air stream. A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case of failure of the main HEPA filter bank~~. 2 2 2 2 INSERT 1 2 2

can filter and; MCR/ESGR envelope; filter; air inside the MCR/ESGR envelope, or supply; heater,

~~The CREFS is an emergency system, parts of which may also operate during normal unit operations in the standby mode of operation.~~ ~~Upon receipt of the actuating signal(s), normal air supply to the control room is isolated, and the stream of ventilation air is recirculated through the system filter trains.~~ ~~The prefilters or demisters remove any large particles in the air, and~~ any entrained water droplets present, to prevent excessive moisture loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 10 hours per month, with the heaters on, reduces moisture buildup on the HEPA filters and adsorbers. Both the demister and heater are important to the effectiveness of the HEPA filters and charcoal adsorbers. 7 2 7 4 2 2

manually; MCR/ESGR envelope; INSERT 2; and exhaust from

In case of a Design Basis Accident (DBA) during movement of recently irradiated fuel assemblies,

~~Actuation of the CREFS places the system in either of two separate states (emergency radiation state or toxic gas isolation state) of the emergency mode of operation, depending on the initiation signal. Actuation of the system to the emergency radiation state of the emergency mode of operation, closes the unfiltered outside air intake and unfiltered exhaust dampers, and aligns the system for recirculation of the control room air through the redundant trains of HEPA and the charcoal filters. The emergency radiation state also initiates pressurization and filtered ventilation of the air supply to the control room.~~ 8

(continued)

Rev. 0

INSERT 1

One EVS train is capable of performing the safety function, supplying filtered air for pressurization. Two of the four EVS trains are required for independence and redundancy.

INSERT 2

and airflow from the bottled air banks is manually actuated to maintain a positive pressure in the MCR/ESGR envelope. The MCR/ESGR envelope consists of the MCR, ESGRs, computer rooms, logic rooms, instrument rack rooms, HVAC equipment rooms, battery rooms 1-I, 1-III, 2-I, and 2-III, the MCR toilet, and the stairwell behind the MCR. Approximately 60 minutes after actuation of the MCR/ESGR bottled air system, a single MCR/ESGR EVS train is manually actuated to provide filtered outside air to the MCR/ESGR envelope through HEPA filters and charcoal adsorbers for pressurization.

MCR/ESGR envelope minimizes (2)

BACKGROUND (continued)

~~Outside air is filtered, diluted with building air from the electrical equipment and cable spreading rooms, and added to the air being recirculated from the control room.~~ (8) Pressurization of the control room envelope prevents infiltration of unfiltered air from the surrounding areas of the building. (2) ~~The actions taken in the toxic gas isolation state are the same, except that the signal switches control room ventilation to an isolation alignment to prevent outside air from entering the control room.~~ (8)

~~The air entering the control room is continuously monitored by radiation and toxic gas detectors. One detector output above the setpoint will cause actuation of the emergency radiation state or toxic gas isolation state, as required. The actions of the toxic gas isolation state are more restrictive, and will override the actions of the emergency radiation state.~~ (8)

MCR/ESGR envelope (2)

A single train of the MCR/ESGR EVS will pressurize the ~~control room~~ MCR/ESGR envelope to ~~about~~ ~~[0.125]~~ ≥ 0.04 inches water gauge. The ~~CREFS~~ MCR/ESGR EHS operation in maintaining the ~~control room~~ MCR/ESGR envelope habitable is discussed in the UFSAR, Section [6.4] (Ref. 1). (1) (2) (1)

Redundant MCR/ESGR EVS supply ~~and recirculation~~ trains provide the required pressurization and filtration should an excessive pressure drop develop across the other filter train. Normally ~~open~~ closed isolation dampers are arranged in series pairs so that the failure of one damper to ~~shut~~ open will not result in ~~a breach of isolation~~ an inability of the system to perform the function based on the presence of the redundant train. The ~~CREFS~~ MCR/ESGR EHS is designed in accordance with Seismic Category I requirements. (2) (2) (2)

The ~~CREFS~~ MCR/ESGR EHS is designed to maintain the control room environment for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding ~~a 5 rem whole body dose or its equivalent to any part of the body~~ the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 2), and NUREG-0800, section 6.4, (Ref. 3). (2) (2)

APPLICABLE SAFETY ANALYSES

The ~~CREFS~~ MCR/ESGR EVS components are arranged in redundant, most safety related ventilation trains. The location of MCR/ESGR components and ducting within the ~~control room~~ envelope ensures an adequate supply of filtered air to all areas requiring access. The ~~CREFS~~ MCR/ESGR EHS provides airborne radiological protection for the control room operators, as demonstrated by the control room accident dose analyses for the most limiting design basis (2) (2)

(continued)

Rev. 0

APPLICABLE SAFETY ANALYSES (continued)

~~loss of coolant~~ accident, fission product release presented in the (1) FSAR, Chapter [15]] (Ref. ~~2~~ 4). (2) (1) (2)

~~The analysis of toxic gas releases demonstrates that the toxicity limits are not exceeded in the control room following a toxic chemical release, as presented in Reference 1.~~ (8)

The worst case single active failure of a component of the ~~CREFS~~ MCR/ESGR EVS During Movement of Recently Irradiated Fuel Assemblies assuming a loss of offsite power, does not impair the ability of the system to perform its design function. (2)

The ~~CREFS~~ satisfies Criterion 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii). (5)

LCO

Two independent and redundant ~~CREFS~~ trains are required to be OPERABLE to ensure that at least one is available assuming a single failure disables the other train. Total system failure could result in exceeding ~~a dose of 5 rem to the control room operator~~ the control room operator dose limits of 10 CFR 50, Appendix A, GDC-19 (Ref. 2) and NUREG-0800, Section 6.4 (Ref. 3) in the event of a large radioactive release. (2)

The ~~CREFS~~ MCR/ESGR EVS is considered OPERABLE when the individual components necessary to limit operator exposure are OPERABLE in ~~both~~ the two required trains of the MCR/ESGR EVS. A ~~CREFS~~ train is OPERABLE when the associated: (2)

a. Fan is OPERABLE;

b. ~~HEPA filters and charcoal~~ Demister filters adsorbers are not excessively restricting flow, and are capable of performing their filtration functions; and (2)

c. Heater, ~~demister~~, flow ductwork, valves, and dampers are OPERABLE, and air ~~circulation~~ can be maintained. (2)

The MCR/ESGR EVS is shared by Unit 1 and Unit 2. (7)

In addition, the MCR/ESGR ~~control room~~ boundary must be maintained, including the integrity of the walls, floors, ceilings, ductwork, and access doors.

INSERT TSTF-287

APPLICABILITY

~~In MODES 1, 2, 3, 4, [5, and 6,] and~~ during movement of recently irradiated fuel assemblies ~~[and during CORE ALTERATIONS]~~. <See ITS 3.7.10> TSTF-51 (2)

(continued)

Rev. 0

INSERT

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

APPLICABILITY (continued)

~~CREFS~~ MCR/ESGR EVS must be OPERABLE to control operator exposure during and following a DBA.

~~In [MODE 5 or 6], the CREFS is required to cope with the release from the rupture of an outside waste gas tank.~~ (8) (2)

During movement of recently irradiated fuel assemblies ~~[and CORE ALTERATIONS]~~, the ~~CREFS~~ must be OPERABLE to ~~cope with~~ respond to the release from a fuel handling accident involving handling recently irradiated fuel. INSERT TSTF-51 (2) TSTF-51 (6)

ACTIONS

A.1

When one required ~~CREFS~~ MCR/ESGR EVS train is inoperable, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining required OPERABLE ~~CREFS~~ MCR/ESGR EVS train is adequate to perform the ~~control room~~ MCR/ESGR envelope protection function. However, the overall reliability is reduced because a single failure in the OPERABLE ~~CREFS~~ MCR/ESGR EVS train could result in loss of ~~CREFS~~ MCR/ESGR EVS function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability. (3)

~~B.1 and B.2~~

~~In MODE 1, 2, 3, or 4, if the inoperable CREFS train cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.~~ See ITS 3.7.10

(3)

B ~~D~~ ~~C~~.1 ~~C.2.1~~ and ~~C~~.2 ~~2~~ TSTF-287

~~[In MODE 5 or 6, or]~~ during movement of recently irradiated fuel assemblies ~~[, or during CORE ALTERATIONS]~~, if the required inoperable MCR/ESGR EVS ~~CREFS~~ train cannot be restored to OPERABLE status within the required Completion Time, or two required MCR/ESGR EVS trains are inoperable, action must be taken to immediately ~~place the OPERABLE CREFS train in the emergency~~ (3) TSTF-51 (2) (3)

(continued)

Rev.0

INSERT

The MCR/ESGR EVS 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 a time frame established by analysis. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time), due to radioactive decay.

TSTF-287
TSTF-51

ACTIONS B D.1, C.2.1, and D.2 2 (continued)

mode. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure would be readily detected. (3)

An alternative to Required Action C.1 is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the control room MCR/ESGR envelope. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position. (2)

Required Action C.1 is modified by a Note indicating to place the system in the toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable. (8)

D.1 and D.2 E TSTF-287

[In MODE 5 or 6, or] during movement of irradiated fuel assemblies [, or during CORE ALTERATIONS], with two CREFS trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might enter the control room. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position. TSTF-51 (3)

E.1

If both CREFS trains are inoperable in MODE 1, 2, 3, or 4, the CREFS 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. See ITS 3.7.10

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1 14 (2)

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on ~~this system~~ the MCR/ESGR EVS are not too severe, (2)

(continued)

Rev. 0

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1 (continued) 14

Each required train

required

testing each train once every month provides an adequate check of this system. Monthly heater operations dry 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.] The 31 day Frequency is based on the reliability of the equipment and the two train redundancy availability. 3

and HEPA filters 11

1

SR 3.7.10.2 14

MCR/ESGR EVS

This SR verifies that the required CREFS testing is performed in accordance with the [Ventilation Filter Testing Program (VFTP)]. The CREFS filter tests are in accordance with Regulatory Guide 1.52 (Ref. 3). The [VFTP] includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the [VFTP]. 2

1

TSTF-362

1

and maximum

10

demister filter 2

1

SR 3.7.10.3

This SR verifies that each CREFS train starts and operates on an actual or simulated actuation signal. The Frequency of [18] months is specified in Regulatory Guide 1.52 (Ref. 3).

<See ITS 3.7.10>

<See ITS 3.7.13>

, by pressurizing the MCR/ESGR envelope,

9

SR 3.7.10.4 14.3 3

This SR verifies the integrity of the control room enclosure, and the assumed inleakage rates of the potentially contaminated air. The control room positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the CREFS. During the emergency mode of operation, the CREFS is designed to pressurize the control room ≥ [0.125] inches water gauge positive pressure with respect to adjacent areas in order to prevent unfiltered inleakage. The CREFS is designed to maintain this positive pressure

MCR/ESGR envelope 2

MCR/ESGR EVS

0.04

1

(continued)

Rev. 0

SURVEILLANCE REQUIREMENTS

SR 3.7.~~10.4~~ 14.3 (continued)

with one train at a makeup flow rate of ~~[3000]~~ ≥ 900 cfm and ≤ 1100 cfm cfm. The Frequency of [18] months on a STAGGERED TEST BASIS is consistent with the guidance provided in NUREG-0800 (Ref. ~~4~~ 3).

REFERENCES

1. FSAR, Section [6.4].

2. 10 CFR 50, Appendix A.

~~2~~ 4. FSAR, Chapter [15].

3. Regulatory Guide 1.52, Rev. 2.

~~4~~ 3. NUREG-0800, Section 6.4, Rev. 2, July 1981.

Rev. 0

1. The brackets have been removed and the appropriate plant specific information has been provided.

2. Changes are made (additions, deletions, and/or changes) to the ISTS to reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

3. Changes are made to reflect those changes made to the Specifications.

4. NAPS uses an MCR/ESGR bottled air system in conjunction with the MCR/ESGR emergency ventilation system to provide the breathing air to the MCR/ESGR envelope. Reference to this system is added as part of the Emergency Habitability System.

5. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36(c)(2)(ii).

6. Bases changes made by TSTF-51 are incorporated with modifications. These modifications incorporate the concept of the approved changes made by TSTF-51, but the analysis value for the required time has not been determined. When the analysis is completed, the required time with be substituted for the phase, "a time frame established by analysis. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time frame."

7. The Bases are modified to reflect certain design aspects of the NAPS MCR/ESGR EVS. The MCR/ESGR EVS is not used during normal unit operations. Each MCR/ESGR EVS train is capable of either recirculating air or providing outside filtered air to provide pressurization. In case of a DBA during movement of recently irradiated fuel assemblies, MCR/ESGR envelope pressurization equipment is manually actuated.

8. Discussion of the emergency radiation state and toxic gas isolation state of operation is not adopted. No toxic gas isolation is required by plant analysis, and actuation of the MCR/ESGR EHS in response to a DBA is described in other parts of the Bases.

9. Editorial change made for enhanced clarity or to be consistent with the ISTS Writers Guide.

10. The Bases for ITS SR 3.7.14.2 state that the Ventilation Filter Testing Program includes testing minimum flow rate of the activated charcoal. Testing of the maximum flow rate is added to the testing listed to be consistent with the Section 5.0 discussion of the VFTP. The maximum flow rate is an appropriate test criteria because of residence times associated with the activated charcoal.

11. The Bases for ITS SR 3.7.14.1 are modified to state that monthly heater operations dry out moisture in the HEPA filters in addition to the charcoal. Drying out the HEPA filters is also an important result of the surveillance, and is added for clarification.

B 3.7 PLANT SYSTEMS Ventilation

B 3.7.13 15 Fuel Building Air Cleanup System (FBACS) (1)

BASES

discharges

BACKGROUND

The FBACS filters airborne radioactive particulates from the area of the fuel pool following a fuel handling accident or loss of coolant accident (LOCA). The FBACS in conjunction with other normally operating systems, also provides environmental control of temperature and humidity in the fuel pool area. (6) (1)

FBVS

The FBACS consists of two independent and redundant trains. Each train consists of a heater, a prefilter or demister, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, valves or and dampers, and instrumentation also form part of the system, as well as demisters, functioning to reduce the relative humidity of the airstream. A second bank of HEPA filters follows the adsorber section to collect carbon fines and provide backup in case the main HEPA filter bank fails. The downstream HEPA filter is not credited in the analysis, but serves to collect charcoal fines, and to back up the upstream HEPA filter should it develop a leak. The system initiates filtered ventilation of the fuel handling building following receipt of a high radiation signal. (7) (2) (1) (1) (2)

, and two redundant fans.

The FBACS is a standby system, parts of which may also be operated during normal plant operations. Upon receipt of the actuating signal, normal air discharges from the building, the fuel handling building is isolated, and the stream of ventilation air discharges through the system filter trains. The prefilters or demisters remove any large particles in the air, and any entrained water droplets present, to prevent excessive loading of the HEPA filters and charcoal adsorbers (7) (1) (2)

FBVS and air

U

The FBACS is discussed in the FSAR, Sections [6.5.1], [9.4.5], and [15.7.4] (Refs. 1, 2, and 3, respectively) because it may be used for normal, as well as post accident, atmospheric cleanup functions. (1) (3) (2)

4.5 and

(continued)

Rev.0

BASES (continued)

APPLICABLE SAFETY ANALYSES 1

involving handling recently irradiated fuel

FBVS

with one fan operating

INSERT 1

The FBACS design basis is established by the consequences of the limiting Design Basis Accident (DBA), which is a fuel handling accident. The analysis of the fuel handling accident, given in Reference 2, assumes that all fuel rods in an assembly are damaged. ~~The analysis of the LOCA assumes that radioactive materials leaked from the Emergency Core Cooling System (ECCS) are filtered and adsorbed by the FBACS.~~ The DBA analysis of the fuel handling accident assumes that only one train of the FBACS is functional ~~due to a single failure that disables the other train. The accident analysis accounts for the reduction in airborne radioactive material provided by the one remaining train of this filtration system.~~ The amount of fission products available for release from the fuel handling building is determined for a fuel handling accident ~~and for a LOCA~~. These assumptions and the analysis follow the guidance provided in Regulatory Guide 1.25 (Ref. 4). 3 TSTF-51 6 1 7 2 1 6 TSTF-51 1

The FBACS satisfies Criterion 3 of the NRC Policy Statement. 10 CFR 50.36(c)(2)(ii) 5

LCO

and at least one fan in operation

FBVS

~~Two independent and redundant trains of~~ the FBACS are is ~~required to be OPERABLE to ensure that at least one train is available, assuming a single failure that disables the other train, coincident with a loss of offsite power.~~ Total system failure could result in the atmospheric release from the fuel handling building exceeding the 10 CFR 100 (Ref. 5 4) limits in the event of a fuel handling accident involving handling recently irradiated fuel. 1 7 7 1 TSTF-51

10 CFR 50, Appendix A, GDC-19

FBVS

The FBACS is considered OPERABLE when the individual components ~~necessary to control exposure in the fuel handling building~~ are OPERABLE ~~in both trains~~. ~~An FBACS~~ The FBVS ~~train~~ is considered OPERABLE when ~~its associated~~: 2 7

at least one

a. Fan is OPERABLE ~~,~~ ; 1 7

~~b. HEPA filter and charcoal adsorber are not excessively restricting flow and are capable of performing their filtration function, and~~ 2

c. ~~Heater, demister,~~ the associated FBVS ductwork, valves, and dampers are OPERABLE, and air circulation can be maintained. 2

INSERT 2 TSTF-287

(continued)

Rev. 0

INSERT 1

Due to radioactive decay, FBVS is only required to be OPERABLE during fuel handling accidents involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within a time frame established by analysis. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time).

INSERT 2

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

(1)

BASES (continued)

APPLICABILITY

In MODE 1, 2, 3, or 4, the FBACS is required to be OPERABLE to provide fission product removal associated with ECCS leaks due to a LOCA and leakage from containment and annulus.

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

(6)

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

TSTF-51

ACTIONS

A.1

With one FBACS train inoperable, action must be taken to restore OPERABLE status within 7 days. During this period, the remaining OPERABLE train is adequate to perform the FBACS function. The 7 day Completion Time is based on the risk from an event occurring requiring the inoperable FBACS train, and the remaining FBACS train providing the required protection.

B.1 and B.2

In MODE 1, 2, 3, or 4, when Required Action A.1 cannot be completed within the associated Completion Time, or when both FBACS trains are inoperable, 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 MODE 3 within 6 hours, and in MODE 5 within 36 hours. The 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.

(4)

C.1 and C.2

When Required Action A.1 cannot be completed within the required Completion Time, during movement of irradiated fuel assemblies in the fuel building, the OPERABLE FBACS train must be started immediately or fuel movement suspended. This action ensures that the remaining train is OPERABLE.

(continued)

Rev.0

(1)

BASES

ACTIONS

C.1 and C.2 (continued)

that no undetected failures preventing system operation will occur, and that any active failure will be readily detected.

If the system is not placed in operation, this action requires suspension of fuel movement, which precludes a fuel handling accident. This does not preclude the movement of fuel assemblies to a safe position.

(4)

A D.1

(4)
(7)

When ~~two trains of~~ the FBACS FBVS ~~are~~ is inoperable or not in operation during movement of recently irradiated fuel assemblies in the fuel building, action must be taken to place the unit in a condition in which the LCO does not apply. Action must be taken immediately to suspend movement of recently irradiated fuel assemblies in the fuel building. This does not preclude the movement of fuel to a safe position.

TSTF-51

SURVEILLANCE REQUIREMENTS

SR 3.7.13.1

Standby systems should be checked periodically to ensure that they function properly. As the environmental and normal operating conditions on this system are not severe, testing each train 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.] The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy available.

(4)

[SR 3.7.13.2

This SR verifies that the required FBACS testing is performed in accordance with the [Ventilation Filter Testing]

(continued)

Rev.0

1

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.13.2 (continued)

[Program (VFTP)]. The FBACS filter tests are in accordance with Regulatory Guide 1.52 (Ref. 6). 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].] 4

[SR 3.7.13.3

This SR verifies that each FBACS train starts and operates on an actual or simulated actuation signal. The [18] month Frequency is consistent with Reference 6.]

SR 3.7.~~13~~.~~4~~ 15 1 4

This SR verifies the integrity of the fuel building enclosure. The ability of the fuel building to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper function of the FBACS FBVS. ~~During the [post accident] mode of operation~~ the FBACS FBVS is designed to maintain a slight negative pressure in the fuel building, to prevent unfiltered LEAKAGE. The FBACS FBVS is designed to maintain a ≤ [-0.125] inches water gauge with respect to atmospheric pressure ~~at a flow rate of [20,000] cfm~~ to the fuel building. The Frequency of [18] months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref. ~~7~~ 5). 4 1 4 1

An [18] month Frequency (on a STAGGERED TEST BASIS) is consistent with Reference 6.

[SR 3.7.13.5

Operating the FBACS filter bypass damper is necessary to ensure that the system functions properly. The OPERABILITY of the FBACS filter bypass damper is verified if it can be closed. An [18] month Frequency is consistent with Reference 6.] 4

(continued)

Rev.0

BASES (continued)

REFERENCES

1. ~~FSAR. Section [6.5.1].~~ 1
1 ~~2~~. U FSAR. Section [9.4.5]. 3
2 ~~3~~. FSAR. Section [15.~~7.4~~]. 4.5
3 ~~4~~. Regulatory Guide 1.25.
4 ~~5~~. 10 CFR 100.
6. ~~Regulatory Guide 1.52 (Rev. 2).~~ 1
5 ~~7~~. NUREG-0800. Section 6.5.1. Rev. 2. July 1981.

Rev.0

1. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The NAPS FHA analysis for the fuel building assumes that all of the radionuclides released from the fuel pool are released without credit for filtration of the released material. This makes the FBVS at NAPS different from the FBACS described in the ISTS because it is not required for the same function, and retaining the FBVS requirement for filtering contamination released as a result of a DBA in the Fuel Building is inappropriate. The ISTS Bases have been changed to reflect the plant-specific design basis, removing references to the filtration function.

3. The brackets have been removed and the proper plant specific information/value has been provided.

4. Changes are made to reflect those changes made to the ISTS. The following requirements are renumbered or revised, where applicable, to reflect the changes.

5. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

6. All references to a LOCA or the ECCS are deleted as they are not applicable to the NAPS FBVS system requirements.

7. The ISTS 3.7.13 LCO is modified to state that the FBVS is required to be OPERABLE, and must be in operation. The NAPS FBVS does not have an automatic start feature, and the FHA analysis assumes that at least one of the FBVS fans is operating at the time of the accident. The FHA analysis also does not assume single failure criteria apply to the FBVS. The Applicability is only during movement of recently irradiated fuel assemblies, not during MODES 1, 2, 3, and 4, as is allowed for by the ISTS in brackets. References to two trains being required and their associated discussions are deleted. These changes are consistent with the NAPS design, FHA analysis, and the current licensing basis.

B 3.7 PLANT SYSTEMS

B 3.7.~~15~~ 16 Fuel Storage Pool Water Level 6

BASES

BACKGROUND

The minimum water level in the fuel storage pool meets the assumptions of iodine decontamination factors following a fuel handling accident. The specified water level shields and minimizes the general area dose when the storage racks are filled to their maximum capacity. The water also provides shielding during the movement of spent fuel.

A general description of the u fuel storage pool design is given in the ~~F~~SAR, Section ~~[~~9.1.2~~]~~ (Ref. 1). A description of the Spent Fuel Pool Cooling and Cleanup System is given in the ~~F~~SAR, Section ~~[~~9.1.3~~]~~ (Ref. 2). The assumptions of the fuel handling accident are given in the u FSAR, Section ~~[15.7.4]~~ 15.4.5 (Ref. 3). 1 2 1 2 1 2

APPLICABLE SAFETY ANALYSES

The minimum water level in the fuel storage pool meets the assumptions of the fuel handling accident described in Regulatory Guide 1.25 (Ref. 4). The resultant 2 hour thyroid dose per person at the exclusion area boundary is ~~a~~ ~~small fraction of~~ within the 10 CFR 100 (Ref. 5) limits. 4

According to Reference 4, there is 23 ft of water between the top of the damaged fuel bundle and the fuel pool surface during a fuel handling accident. With 23 ft of water, the assumptions of Reference 4 can be used directly. In practice, this LCO preserves this assumption for the bulk of the fuel in the storage racks. In the case of a single bundle dropped and lying horizontally on top of the spent fuel racks, however, there may be < 23 ft of water above the top of the fuel bundle and the surface, indicated by the width of the bundle. To offset this small nonconservatism, the analysis assumes that all fuel rods fail, although analysis shows that only the first few rows fail from a hypothetical maximum drop.

TSTF-137

The fuel storage pool water level satisfies ~~Criterion 2~~ Criteria 2 and 3 of ~~the NRC Policy Statement~~ 10 CFR 50.36(c)(2)(ii). 3

(continued)

Rev.0

BASES (continued)

LCO

The fuel storage pool water level is required to be ≥ 23 ft over the top of irradiated fuel assemblies seated in the storage racks. The specified water level preserves the assumptions of the fuel handling accident analysis (Ref. 3). As such, it is the minimum required for fuel storage and movement within the fuel storage pool.

APPLICABILITY

This LCO applies during movement of irradiated fuel assemblies in the fuel storage pool, since the potential for a release of fission products exists.

ACTIONS

A.1

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

When the initial conditions for prevention of an accident cannot be met, steps should be taken to preclude the accident from occurring. When the fuel storage pool water level is lower than the required level, the movement of irradiated fuel assemblies in the fuel storage pool is immediately suspended to a safe position. This action effectively precludes the occurrence of a fuel handling accident. This does not preclude movement of a fuel assembly to a safe position.

If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODES 1, 2, 3, and 4, the fuel movement is independent of reactor operations. Therefore, inability to suspend movement of irradiated fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.15.1 16 6

This SR verifies sufficient fuel storage pool water is available in the event of a fuel handling accident. The water level in the fuel storage pool must be checked periodically. The 7 day Frequency is appropriate because

(continued)

Rev.0

6

BASES

SURVEILLANCE REQUIREMENTS	SR 3.7.~~15~~ 16.1 (continued) 6 the volume in the pool is normally stable. Water level changes are controlled by plant procedures and are acceptable based on operating experience. During refueling operations, the level in the fuel storage pool is in equilibrium with the refueling canal, and the level in the refueling canal is checked daily in accordance with SR 3.9.6.1.
REFERENCES	U 1. FSAR, Section ~~[~~9.1.2~~]~~. 1 2 2. FSAR, Section ~~[~~9.1.3~~]~~. 1 2 3. FSAR, Section ~~[15.7.4]~~ 15.4.5. 1 2 4. Regulatory Guide 1.25~~, [Rev. 0]~~. 5 5. 10 CFR 100.11.

Rev.0

B 3.7 PLANT SYSTEMS

B 3.7.16 Fuel Storage Pool Boron Concentration

BASES

BACKGROUND

In the Maximum Density Rack (MDR) [(Refs. 1 and 2)] design, the spent fuel storage pool is divided into two separate and distinct regions which, for the purpose of criticality considerations, are considered as separate pools. [Region 1], with [336] storage positions, is designed to accommodate new fuel with a maximum enrichment of [4.65] wt% U-235, or spent fuel regardless of the discharge fuel burnup. [Region 2], with [2670] storage positions, is designed to accommodate fuel of various initial enrichments which have accumulated minimum burnups within the acceptable domain according to Figure [3.7.17-1], in the accompanying LCO. Fuel assemblies not meeting the criteria of Figure [3.7.17-1] shall be stored in accordance with paragraph 4.3.1.1 in Section 4.3, Fuel Storage.

The water in the spent fuel storage pool normally contains soluble boron, which results in large subcriticality margins under actual operating conditions. However, the NRC guidelines, based upon the accident condition in which all soluble poison is assumed to have been lost, specify that the limiting k_{eff} of 0.95 be evaluated in the absence of soluble boron. Hence, the design of both regions is based on the use of unborated water, which maintains each region in a subcritical condition during normal operation with the regions fully loaded. The double contingency principle discussed in ANSI N-16.1-1975 and the April 1978 NRC letter (Ref. 3) allows credit for soluble boron under other abnormal or accident conditions, since only a single accident need be considered at one time. For example, the most severe accident scenario is associated with the movement of fuel from [Region 1 to Region 2], and accidental misloading of a fuel assembly in [Region 2]. This could potentially increase the criticality of [Region 2]. To mitigate these postulated criticality related accidents, boron is dissolved in the pool water. Safe operation of the MDR with no movement of assemblies may therefore be achieved by controlling the location of each assembly in accordance with LCO 3.7.17, "Spent Fuel Assembly Storage." Prior to movement of an assembly, it is necessary to perform SR 3.7.16.1.

6

(continued)

Rev.0

BASES (continued)

APPLICABLE SAFETY ANALYSES	Most accident conditions do not result in an increase in the activity of either of the two regions. Examples of these accident conditions are the loss of cooling (reactivity increase with decreasing water density) and the dropping of a fuel assembly on the top of the rack. However, accidents can be postulated that could increase the reactivity. This increase in reactivity is unacceptable with unborated water in the storage pool. Thus, for these accident occurrences, the presence of soluble boron in the storage pool prevents criticality in both regions. The postulated accidents are basically of two types. A fuel assembly could be incorrectly transferred from [Region 1 to Region 2] (e.g., an unirradiated fuel assembly or an insufficiently depleted fuel assembly). The second type of postulated accidents is associated with a fuel assembly which is dropped adjacent to the fully loaded [Region 2] storage rack. This could have a small positive reactivity effect on [Region 2]. However, the negative reactivity effect of the soluble boron compensates for the increased reactivity caused by either one of the two postulated accident scenarios. The accident analyses is provided in the FSAR, Section [15.7.4] (Ref. 4). (6) The concentration of dissolved boron in the fuel storage pool satisfies Criterion 2 of the NRC Policy Statement.
LCO	The fuel storage pool boron concentration is required to be ≥ [2300] ppm. The specified concentration of dissolved boron in the fuel storage pool preserves the assumptions used in the analyses of the potential critical accident scenarios as described in Reference 4. This concentration of dissolved boron is the minimum required concentration for fuel assembly storage and movement within the fuel storage pool.
APPLICABILITY	This LCO applies whenever fuel assemblies are stored in the spent fuel storage pool, until a complete spent fuel storage pool verification has been performed following the last movement of fuel assemblies in the spent fuel storage pool. This LCO does not apply following the verification, since the verification would confirm that there are no misloaded fuel assemblies. With no further fuel assembly movements in

(continued)

Rev.O

BASES

APPLICABILITY (continued)

progress, there is no potential for a misloaded fuel assembly or a dropped fuel assembly.

ACTIONS

A.1, A.2.1, and A.2.2

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

When the concentration of boron in the fuel storage pool is less than required, immediate action must be taken to preclude the occurrence of an accident or to mitigate the consequences of an accident in progress. This is most efficiently achieved by immediately suspending the movement of fuel assemblies. The concentration of boron is restored simultaneously with suspending movement of fuel assemblies. An acceptable alternative is to verify by administrative means that the fuel storage pool verification has been performed since the last movement of fuel assemblies in the fuel storage pool. However, prior to resuming movement of fuel assemblies, the concentration of boron must be restored. This does not preclude movement of a fuel assembly to a safe position.

If the LCO is not met while moving irradiated fuel assemblies in MODE 5 or 6, LCO 3.0.3 would not be applicable. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operation. Therefore, inability to suspend movement of fuel assemblies is not sufficient reason to require a reactor shutdown.

6

SURVEILLANCE REQUIREMENTS

SR 3.7.16.1

This SR verifies that the concentration of boron in the fuel storage pool is within the required limit. As long as this SR is met, the analyzed accidents are fully addressed. The 7 day Frequency is appropriate because no major replenishment of pool water is expected to take place over such a short period of time.

(continued)

Rev. 0

BASES (continued)

REFERENCES

1. Callaway FSAR, Appendix 9.1A, "The Maximum Density Rack (MDR) Design Concept."
2. Description and Evaluation for Proposed Changes to Facility Operating Licenses DPR-39 and DPR-48 (Zion Power Station).
3. Double contingency principle of ANSI N16.1-1975, as specified in the April 14, 1978 NRC letter (Section 1.2) and implied in the proposed revision to Regulatory Guide 1.13 (Section 1.4, Appendix A).
4. FSAR, Section [15.7.4].

6

Rev.0

B 3.7 PLANT SYSTEMS

B 3.7.17 Spent Fuel Assembly Storage

BASES

BACKGROUND

In the Maximum Density Rack (MDR) [(Refs. 1 and 2)] design, the spent fuel storage pool is divided into two separate and distinct regions which, for the purpose of criticality considerations, are considered as separate pools. [Region 1], with [336] storage positions, is designed to accommodate new fuel with a maximum enrichment of [4.65] wt% U-235, or spent fuel regardless of the discharge fuel burnup. [Region 2], with [2670] storage positions, is designed to accommodate fuel of various initial enrichments which have accumulated minimum burnups within the acceptable domain according to Figure 3.7.17-1, in the accompanying LCO. Fuel assemblies not meeting the criteria of Figure [3.7.17-1] shall be stored in accordance with paragraph 4.3.1.1 in Section 4.3, Fuel Storage.

6

The water in the spent fuel storage pool normally contains soluble boron, which results in large subcriticality margins under actual operating conditions. However, the NRC guidelines, based upon the accident condition in which all soluble poison is assumed to have been lost, specify that the limiting k_{eff} of 0.95 be evaluated in the absence of soluble boron. Hence, the design of both regions is based on the use of unborated water, which maintains each region in a subcritical condition during normal operation with the regions fully loaded. The double contingency principle discussed in ANSI N-16.1-1975 and the April 1978 NRC letter (Ref. 3) allows credit for soluble boron under other abnormal or accident conditions, since only a single accident need be considered at one time. For example, the most severe accident scenario is associated with the movement of fuel from [Region 1 to Region 2], and accidental misloading of a fuel assembly in [Region 2]. This could potentially increase the criticality of [Region 2]. To mitigate these postulated criticality related accidents, boron is dissolved in the pool water. Safe operation of the MDR with no movement of assemblies may therefore be achieved by controlling the location of each assembly in accordance with the accompanying LCO. Prior to movement of an assembly, it is necessary to perform SR 3.7.16.1.

(continued)

Rev.0

BASES (continued)

APPLICABLE SAFETY ANALYSES

The hypothetical accidents can only take place during or as a result of the movement of an assembly (Ref. 4). For these accident occurrences, the presence of soluble boron in the spent fuel storage pool (controlled by LCO 3.7.16, "Fuel Storage Pool Boron Concentration") prevents criticality in both regions. By closely controlling the movement of each assembly and by checking the location of each assembly after movement, the time period for potential accidents may be limited to a small fraction of the total operating time. During the remaining time period with no potential for accidents, the operation may be under the auspices of the accompanying LCO.

The configuration of fuel assemblies in the fuel storage pool satisfies Criterion 2 of the NRC Policy Statement.

LCO

The restrictions on the placement of fuel assemblies within the spent fuel pool, in accordance with Figure 3.7.17-1, in the accompanying LCO, ensures the k_{eff} of the spent fuel storage pool will always remain < 0.95, assuming the pool to be flooded with unborated water. Fuel assemblies not meeting the criteria of Figure [3.7.17-1] shall be stored in accordance with Specification 4.3.1.1 in Section 4.3.

(6)

APPLICABILITY

This LCO applies whenever any fuel assembly is stored in [Region 2] of the fuel storage pool.

ACTIONS

A.1

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

When the configuration of fuel assemblies stored in [Region 2] the spent fuel storage pool is not in accordance with Figure 3.7.17-1, or paragraph 4.3.1.1, the immediate action is to initiate action to make the necessary fuel assembly movement(s) to bring the configuration into compliance with Figure 3.7.17-1 or Specification 4.3.1.1.

(continued)

Rev.0

BASES

ACTIONS

A.1 (continued)

If unable to move irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not be applicable. If unable to move irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the action is independent of reactor operation. Therefore, inability to move fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.7.17.1

This SR verifies by administrative means that the initial enrichment and burnup of the fuel assembly is in accordance with Figure [3.7.17-1] in the accompanying LCO. For fuel assemblies in the unacceptable range of Figure 3.7.17-1, performance of this SR will ensure compliance with Specification 4.3.1.1.

6

REFERENCES

1. Callaway FSAR, Appendix 9.1A, "The Maximum Density Rack (MDR) Design Concept."

2. Description and Evaluation for Proposed Changes to Facility Operating Licenses DPR-39 and DPR-48 (Zion Power Station).

3. Double contingency principle of ANSI N16.1-1975, as specified in the April 14, 1978 NRC letter (Section 1.2) and implied in the proposed revision to Regulatory Guide 1.13 (Section 1.4, Appendix A).

4. FSAR, Section [15.7.4].

Rev. 0

1. Changes are made (additions, deletions, and/or changes) to the ISTS which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

2. The brackets have been removed and the proper plant specific information/value has been provided.

3. The criteria of the NRC Final Policy Statement on Technical Specifications Improvements have been included in 10 CFR 50.36(c)(2)(ii). Therefore, references in the ISTS Bases to the NRC Final Policy Statement are revised in the ITS Bases to reference 10 CFR 50.36.

4. The description of the fuel handling accident (outside containment) exclusion area boundary dose is revised to be consistent with the description given in the NRC's SER for the North Anna analysis.

5. The ISTS provides a bracketed reference to a revision number for Regulatory Guide 1.25. Regulatory Guide 1.25 was originally issued as Safety Guide 25 in March, 1972 and does not have a revision number. Therefore, the bracketed reference is deleted.

6. Changes are made to reflect consistency with or those changes made to the ISTS. The following requirements are renumbered or revised, where applicable, to reflect the changes.