

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1.1 As a minimum, the reactor trip system instrumentation channels and interlocks of Table 3.3-1 shall be OPERABLE.

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

4.3.1.1.1 Each reactor trip system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations at the frequencies specified in the Surveillance Frequency Control Program unless otherwise noted in Table 4.3-1.

4.3.1.1.2 The logic for the interlocks shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. The total interlock function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be verified to be within its limit in accordance with the Surveillance Frequency Control Program. Neutron detectors are exempt from response time testing.

TABLE 3.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NUMBER OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
1. Manual Reactor Trip	2	1	2	1,2 and *	12
2. Power Range, Neutron Flux	4	2	3	1,2 and 3*	2
3. Power Range, Neutron Flux High Positive Rate	4	2	3	1,2	2
4. <u>Deleted</u>					
5. Intermediate Range, Neutron Flux	2	1	2	1 ^(a) , 2 ^(b)	3
6. Source Range, Neutron Flux					
A. Startup	2	1	2	2 ^(c)	4
B. Shutdown	2	0	1	3,4 and 5	5
C. Shutdown	2	1	2	3*,4* and 5*	7
7. Overtemperature ΔT	4	2	3	1,2	6
8. Overpower ΔT	4	2	3	1,2	6
9. Pressurizer Pressure-Low	4	2	3	1,2	6
10. Pressurizer Pressure--High	4	2	3	1,2	6

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NUMBER OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
11. Pressurizer Water Level--High	3	2	2	1, 2	6
12. Loss of Flow - Single Loop (Above P-8)	3/loop	2/loop in any operating loop	2/loop in each operating loop	1	6
13. Loss of Flow - Two Loops (Above P-7 and below P-8)	3/loop	2/loop in two operating loops	2/loop in each operating loop	1	6
14. Steam Generator Water Level-- Low-Low	3/loop	2/loop in any operating loops	2/loop in each operating loop	1, 2	6
15. Deleted					
16. Undevoltage-Reactor Coolant Pumps	4-1/bus	1/2 twice	3	1	6
17. Underfrequency-Reactor Coolant Pumps	4-1/bus	1/2 twice	3	1	6

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NUMBER OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
18. Turbine Trip					
a. Low Autostop Oil Pressure	3	2	2	1 [#]	6
b. Turbine Stop Valve Closure	4	4	3	1 [#]	6
19. Safety Injection Input from ESF	2	1	2	1,2	10
20. Reactor Coolant Pump Breaker Position Trip (above P-7)	1/breaker	2	1/breaker per operating loop	1	11
21. Reactor Trip Breakers	2	1	2	1,2 3*,4*,5*	1 ^{###} , 14 13
22. Automatic Trip Logic	2	1	2	1,2 3*,4*,5*	10 13

TABLE 3.3-1 (Continued)

TABLE NOTATION

- (a) Below the P-10 (Power Range Neutron Flux) interlocks
- (b) Above the P-6 (Intermediate Range Neutron Flux) interlocks
- (c) Below the P-6 (Intermediate Range Neutron Flux) interlocks

- * With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal.

- ** Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SHUTDOWN MARGIN

- # Above the P-9 (Power Range Neutron Flux) interlock.

- ### If ACTION Statement 1 is entered as a result of Reactor Trip Breaker (RTB) or Reactor Trip Bypass Breaker (RTBB) maintenance testing results exceeding the following acceptance criteria, NRC reporting shall be made within 30 days in accordance with Specification 6.9.2:
 - 1. A RTB or RTBB trip failure during any surveillance test with less than or equal to 300 grams of weight added to the breaker trip bar.
 - 2. A RTB or RTBB time response failure that results in the overall reactor trip system time response exceeding the Technical Specification limit.

ACTION STATEMENTS

- ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel (RTB) to OPERABLE within 24 hours or be in HOT STANDBY within the next 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.1.1.1 provided the other channel is OPERABLE.

- ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:
 - a. The inoperable channel is placed in the tripped condition within 72 hours.
 - b. The Minimum Channels OPERABLE requirement is met; however, one channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.1.1.1.
 - c. Either, THERMAL POWER is restricted to $\leq 75\%$ of RATED THERMAL POWER and the Power Range, Neutron Flux trip setpoint is reduced to $\leq 85\%$ of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours.
 - d. The QUADRANT POWER TILT RATIO, as indicated by the remaining three detectors, is verified consistent with the normalized symmetric power distribution obtained by using either the movable in-core detectors in the four pairs of symmetric thimble locations or the power distribution monitoring system at least once per 12 hours when THERMAL POWER is greater than 75% of RATED THERMAL POWER.

TABLE 3.3-1 (Continued)

ACTION 3 - With the number of channels OPERABLE:

- a. One less than required by the Minimum Channels OPERABLE requirement
 - 1. Reduce THERMAL POWER to < P-6 within 24 hours or,
 - 2. Increase THERMAL POWER to > P-10 within 24 hours.
- b. Two less than required by the Minimum Channels OPERABLE requirement
 - 1. Immediately suspend operations involving positive reactivity additions** and,
 - 2. Reduce THERMAL POWER to < P-6 within 2 hours.

ACTION 4 - With the number of channels OPERABLE:

- a. One less than required by the Minimum Channels OPERABLE requirement, immediately suspend operations involving positive reactivity additions**.
- b. Two less than required by the Minimum Channels OPERABLE requirement, immediately open reactor trip breakers.

ACTION 5 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

- a. The inoperable channel is placed in the tripped condition within 72 hours.
- b. The Minimum Channel OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

TABLE 3.3-1 (Continued)

ACTION 7 - With the number of channels OPERABLE:

- a. One less than required by the Minimum Channels OPERABLE requirement:
 - 1. Restore the channel to OPERABLE status within 48 hours or
 - 2. Initiate action to fully insert all rods within 48 hours and place the Control Rod Drive System in a condition incapable of rod withdrawal within the next hour.
- b. Two less than required by the Minimum Channels OPERABLE requirement, immediately open reactor trip breakers.

ACTION 8 - NOT USED

ACTION 9 - NOT USED

ACTION 10 - With the number of OPERABLE Channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 24 hours or be in at least HOT STANDBY in the next 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.1.1.1 provided the other channel is OPERABLE.

ACTION 11 - With less than the Minimum Number of Channels OPERABLE, operation may continue provided the inoperable channel is placed in the tripped condition within 72 hours.

ACTION 12 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours and/or open the reactor trip breakers.

ACTION 13 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or open the reactor trip breakers within the next hour.

ACTION 14 - With one of the diverse trip features (Undervoltage or shunt trip attachment) inoperable, restore it to OPERABLE status within 48 hours or declare the breaker inoperable and be in at least HOT STANDBY within 6 hours. The breaker shall not be bypassed while one of the diverse trip features is inoperable except for the time required for performing maintenance to restore the breaker to OPERABLE status.

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INTERLOCKS

<u>DESIGNATION</u>	<u>CONDITION AND SETPOINT</u>	<u>FUNCTION</u>
P-6	With 2 of 2 Intermediate Range Neutron Flux Channels < 4.7×10^{-6} % of RTP.	P-6 prevents or defeats the manual block of source range reactor trip.
P-7	With 2 of 4 Power Range Neutron Flux Channels \geq 11% of RATED THERMAL POWER or 1 of 2 Turbine steam line inlet pressure channels \geq a pressure equivalent to 11% of RATED THERMAL POWER.	P-7 prevents or defeats the automatic block of reactor trip on: Low flow in more than one primary coolant loop, reactor coolant pump undervoltage and under-frequency, pressurizer low pressure, pressurizer high level, and the opening of more than one reactor coolant pump breaker.
P-8	With 2 of 4 Power Range Neutron flux channels \geq 36% of RATED THERMAL POWER.	P-8 prevents or defeats the automatic block of reactor trip on low coolant flow in a single loop.
P-9	With 2 of 4 Power range neutron flux channels \geq 50% of RATED THERMAL POWER.	P-9 prevents or defeats the automatic block of reactor trip on turbine trip.
P-10	With 3 of 4 Power range neutron flux channels < 9% of RATED THERMAL POWER.	P-10 prevents or defeats the manual block of: Power range low setpoint reactor trip, Intermediate range reactor trip, and intermediate range rod stops. Provides input to P-7.

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TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK⁽¹⁵⁾</u>	<u>CHANNEL CALIBRATION⁽¹⁵⁾</u>	<u>CHANNEL FUNCTIONAL TEST⁽¹⁵⁾</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
1. Manual Reactor Trip Switch	N.A.	N.A.	(9)	1, 2, and *
2. Power Range, Neutron Flux		(2), (3) (6) (17)	(18)	1, 2, and 3*
3. Power Range, Neutron Flux, High Positive Rate	N.A.	(6)	(18)	1, 2
4. Deleted				
5. Intermediate Range, Neutron Flux		(6), #, ##	S/U ⁽¹⁾ #, ##	1 ^(a) , 2 ^(b)
6. Source Range, Neutron Flux				
A. Startup		(6), #, ##	(16), (8) and S/U ⁽¹⁾ #, ##	2 ⁽⁷⁾
B. Shutdown		(6)	N.A.	3, 4, 5
C. Shutdown		(6), #, ##	(10), #, ##	3*, 4*, 5*
7. Overtemperature ΔT				1, 2
8. Overpower ΔT				1, 2
9. Pressurizer Pressure--Low				1, 2
10. Pressurizer Pressure--High				1, 2
11. Pressurizer Water Level--High				1, 2
12. Loss of Flow - Single Loop				1

If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.

The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the nominal Trip Setpoint at the completion of the surveillance; otherwise the channel shall be declared inoperable. Setpoints more conservative than the nominal Trip Setpoint are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the surveillance procedures to confirm channel performance. The methodologies used to determine the as-found and as-left tolerances are specified in the Technical Specification Bases.

(a) Below the P-10 (Power Range Neutron Flux) interlocks

(b) Above the P-6 (Intermediate Range Neutron Flux) interlocks

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK⁽¹⁵⁾</u>	<u>CHANNEL CALIBRATION⁽¹⁵⁾</u>	<u>CHANNEL FUNCTIONAL TEST⁽¹⁵⁾</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
13. Loss of Flow Two Loops			N.A.	1
14. Steam Generator Water Level-- Low-Low				1, 2
15. DELETED				
16. Undervoltage - Reactor Coolant Pumps	N.A.			1
17. Underfrequency - Reactor Coolant Pumps	N.A.			1
18. Turbine Trip				
a. Low Autostop Oil Pressure	N.A.	N.A.	S/U ⁽¹⁾	1#
b. Turbine Stop Valve Closure	N.A.	N.A.	S/U ⁽¹⁾	1#
19. Safety Injection Input from ESF	N.A.	N.A.	(4)(5)	1, 2
20. Reactor Coolant Pump Breaker Position Trip	N.A.	N.A.		1
21. Reactor Trip Breaker	N.A.	N.A.	(5)(11)(13)(14)	1, 2 and *
22. Automatic Trip Logic	N.A.	N.A.	(5)	1, 2 and *

Above the P-9 (Power Range Neutron Flux) Interlock

TABLE 4.3-1 (Continued)

NOTATION

- * With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal.
- (1) - If not performed in previous 31 days.
- (2) - Heat balance only, above 15% of RATED THERMAL POWER.
- (3) - Compare incore to excore axial offset above 15% of RATED THERMAL POWER. Recalibrate if absolute difference \geq 3 percent.
- (4) - Manual SSPS functional input check in accordance with the Surveillance Frequency Control Program.
- (5) - Each train or logic channel shall be tested in accordance with the Surveillance Frequency Control Program.
- (6) - Neutron detectors may be excluded from CHANNEL CALIBRATION.
- (7) - Below P-6 (Block of Source Range Reactor Trip) setpoint.
- (8) - If not performed within the frequency of the Surveillance Frequency Control Program, perform the CHANNEL FUNCTIONAL TEST within 4 hours after reducing power below P-6.
- (9) - The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the Undervoltage and Shunt Trip mechanism for the Manual Reactor Trip Function.

The Test shall also verify OPERABILITY of the Bypass Breaker Trip circuits.
- (10) - If not performed within the frequency of the Surveillance Frequency Control Program, perform the CHANNEL FUNCTIONAL TEST within 4 hours of entering MODE 3 from MODE 2.
- (11) - The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the Reactor Trip Breaker Undervoltage and Shunt Trip mechanisms.
- (12) - DELETED
- (13) - Verify operation of Bypass Breakers Shunt Trip function from local pushbutton while breaker is in the test position prior to placing breaker in service.
- (14) - Perform a functional test of the Bypass Breakers U.V. Attachment via the SSPS.
- (15) - Frequencies are specified in the Surveillance Frequency Control Program unless otherwise noted in the table.
- (16) - At the frequency specified in the Surveillance Frequency Control Program.
- (17) - In MODES 1 and 2, the SSPS input relays are excluded from this Surveillance when the installed bypass test capability is used to perform this Surveillance.
- (18) - The SSPS input relays are excluded from this Surveillance when the installed bypass test capability is used to perform this Surveillance.

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2.1 The Engineered Safety Feature Actuation System (ESFAS) instrumentation channels and interlocks shown in Table 3.3-3 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3-4.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

- a. With an ESFAS instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.3-3 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Trip Setpoint value.
- b. With an ESFAS instrumentation channel inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

4.3.2.1.1 Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations at frequencies specified in the Surveillance Frequency Control Program unless otherwise noted in Table 4.3-2.

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program during CHANNEL CALIBRATION testing of each channel affected by interlock operation.

4.3.2.1.3 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within the limit in accordance with the Surveillance Frequency Control Program. The provisions of Specification 4.0.4 are not applicable to MSIV closure time testing. The provisions of Specification 4.0.4 are not applicable to the turbine driven auxiliary feedwater pump provided the surveillance is performed within 24 hours after the secondary steam generator pressure is greater than 680 psig.

TABLE 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
1. SAFETY INJECTION					
a. Manual Initiation	2	1	2	1,2,3,4	18
b. Automatic Actuation Logic	2	1	2	1,2,3,4	13
c. Containment Pressure-High	3	2	2	1,2,3	19
d. Pressurizer Pressure-Low	3	2	2	1,2,3 [#]	19
e. Differential Pressure Between Steam Lines - High	3/steam line	2/steam line any steam lines	2/steam line	1,2,3 ^{##}	19
f. Steam Flow in Two Steam Lines-High	2/steam line	1/steam line any 2 steam lines	1/steam line	1,2,3 ^{##}	19
COINCIDENT WITH EITHER					
T _{avg} --Low-Low	1 T _{avg} /loop	1 T _{avg} in any 2 loops	1 T _{avg} in any 3 loops	1,2,3 ^{##}	19
OR, COINCIDENT WITH					
Steam Line Pressure-Low	1 pressure/ loop	1 pressure any 2 loops	1 pressure any 3 loops	1,2,3 ^{##}	19

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TABLE 3.3 (continued)
ENGINEERED SAFETY FEATURE ACTIVATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
2. CONTAINMENT SPRAY					
a. Manual	2 sets of 2	1 set of 2	2 sets of 2	1,2,3,4	18
b. Automatic Actuation Logic	2	1	2	1,2,3,4	13
c. Containment Pressure--High-High	4	2	3	1,2,3	16
3. CONTAINMENT ISOLATION					
a. Phase "A" Isolation					
1) Manual	2	1	2	1,2,3,4	18
2) From Safety Injection Automatic Actuation Logic	2	1	2	1,2,3,4	13

SALEM - UNIT 2

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Amendment No. 116

JAN 5 1993

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
h. Phase "B" Isolation					
1) Manual	2 sets of 2	1 set of 2	2 sets of 2	1, 2, 3, 4	18
2) Automatic Actuation Logic	2	1	2	1, 2, 3, 4	13
3) Containment Pressure--High-High	4	2	3	1, 2, 3	16
c. Containment Ventilation Isolation.					
1) Manual	2	1	2	1, 2, 3, 4	17
2) Automatic Actuation Logic	2	1	2	1, 2, 3, 4	13
3) Containment Atmosphere Gaseous Radioactivity-High		per table 3.3-6			

SALEM - UNIT 2

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Amendment No. 53
APR 10 1987

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
4. STEAM LINE ISOLATION					
a. Manual	2/steam line	1/steam line	1/operating steam line	1, 2 ^(a) , 3 ^(a)	23
b. Automatic Actuation Logic	2***	1	2	1, 2 ^(a) , 3 ^(a)	20
c. Containment Pressure--High-High	4	2	3	1, 2 ^(a) , 3 ^(a)	16
d. Steam Flow in Two Steam Lines--High	2/steam line	1/steam line any 2 steam lines	1/steam line	1, 2 ^(a) , 3 ^{##(a)}	19
COINCIDENT WITH EITHER					
T _{avg} --Low-Low	1 T _{avg} /loop	1 T _{avg} in any 2 loops	1 T _{avg} in any 3 loops	1, 2 ^(a) , 3 ^{##(a)}	19
OR, COINCIDENT WITH					
Steam Line Pressure-Low	1 pressure/loop	1 pressure any 2 loops	1 pressure any 3 loops	1, 2 ^(a) , 3 ^{##(a)}	19

^(a) Except when all MSIVs are closed.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
5. TURBINE TRIP AND FEEDWATER ISOLATION					
a. Safety Injection	Refer to Functional Unit 1 for all initiation functions and requirements. The applicability exceptions of footnote (*) also apply to Functional Unit 5.a.				
b. Automatic Actuation Logic	2	1	2	1,2*,3*	20
c. Steam Generator Water level-- High-High	3/loop	2/loop in any operating loop	2/loop in each operating loop	1,2*,3*	19
6. SAFEGUARDS EQUIPMENT CONTROL SYSTEM (SEC)	3	2	3	1,2,3,4	13
7. UNDERVOLTAGE, VITAL BUS					
a. Loss of Voltage	1/bus	2	3	1,2,3	14
b. Sustained Degraded Voltage	3/bus	2/bus	3/bus	1,2,3	14

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
8. AUXILIARY FEEDWATER					
a. Automatic Actuation Logic **	2	1	2	1,2,3	20
b. NOT USED					
c. Stm. Gen. Water Level-Low-Low					
i. Start Motor Driven Pumps	3/stm. gen.	2/stm. gen. any stm. gen.	2/stm. gen.	1,2,3	19
ii. Start Turbine Driven Pumps	3/stm. gen.	2/stm. gen. any 2 stm.gen.	2/stm. gen.	1,2,3	19
d. Undervoltage - RCP Start Turbine - Driven Pump	4-1/bus	1/2 x 2	3	1,2	19
e. S.I. Start Motor-Driven Pumps	See 1 above (All S.I. initiating functions and requirements)				
f. Trip of Main Feedwater Pumps Start Motor-Driven Pumps	2/pump	1/pump	1/pump	1,2	21
g. Station Blackout	See 6 and 7 above (SEC and UV Vital Bus)				
9. SEMIAUTOMATIC TRANSFER TO RECIRCULATION					
a. RWST Level Low	4	2	3	1,2,3	16
b. Automatic Actuation Logic	2	1	2	1,2,3	20

TABLE 3.3-3 (Continued)

TABLE NOTATION

- # Trip function may be bypassed in this MODE below P-11.
- ## Trip function may be bypassed in this MODE below P-12.
- * Except when all main feedwater lines are isolated by (1) a closed and de-activated feedwater isolation valve, or (2) closed and de-activated feedwater regulating valve (FRV) and FRV bypass valves, or (3) a closed manual valve.
- ** Applies to Functional Unit 8 items c and d.
- *** The automatic actuation logic includes two redundant solenoid operated vent valves for each Main Steam Isolation Valve (MSIV). Vent valves associated with an inoperable MSIV may be isolated provided that the MSIV is closed in accordance with actions of TS 3.7.1.5. One vent valve on any one of the remaining OPERABLE or open MSIVs may be isolated without affecting the function of the automatic actuation logic provided the remaining solenoid vent valves remain OPERABLE. The isolated MSIV vent valve shall be returned to OPERABLE status upon the first entry into MODE 5 following determination that the vent valve is inoperable. For any condition where more than one solenoid vent valve is inoperable for the OPERABLE or open MSIVs, entry into ACTION 20 is required.

ACTION STATEMENTS

- ACTION 13 - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 24 hours or, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1 provided the other channel is OPERABLE.
- ACTION 14 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed until performance of the next required CHANNEL FUNCTIONAL TEST, provided the inoperable channel is placed in the tripped condition within 72 hours.
- ACTION 15 - NOT USED
- ACTION 16 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed provided the inoperable channel is placed in the bypassed condition and the Minimum Channels OPERABLE requirement is demonstrated by CHANNEL CHECK within 72 hours; one additional channel may be bypassed for up to 12 hours for surveillance testing per Specification 4.3.2.1.1.
- ACTION 17 - With less than the Minimum Channels OPERABLE, operation may continue provided the containment purge and exhaust valves are maintained closed.
- ACTION 18 - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

TABLE 3.3-3 (Continued)

- ACTION 19 - With the number of OPERABLE Channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:
- a. The inoperable channel is placed in the tripped condition within 72 hours.
 - b. The Minimum Channels OPERABLE requirements is met; however, the inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels per Specification 4.3.2.1.1.
- ACTION 20 - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to operable status within 24 hours or, be in at least HOT STANDBY within the next 6 hours and in at least HOT SHUTDOWN within the following 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.1 provided the other channel is OPERABLE.
- ACTION 21 - With the number of OPERABLE channels one less than the Minimum Number of Channels, operation may proceed provided that the inoperable channel is restored to OPERABLE within 72 hours.
- ACTION 22 - NOT USED
- ACTION 23 - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES INTERLOCKS

<u>DESIGNATION</u>	<u>CONDITION AND SETPOINT</u>	<u>FUNCTION</u>
P-11	With 2 of 3 pressurizer pressure channels ≥ 1925 psig.	P-11 prevents or defeats manual block of safety injection actuation on low pressurizer pressure.
P-12	With 3 of 4 T_{avg} channels at a setpoint of 543°F and T_{avg} increasing (with an allowable setpoint value $\leq 545^{\circ}\text{F}$)	P-12 prevents or defeats manual block of safety injection actuation high steam line flow and low steam line pressure.
	With 2 of 4 T_{avg} channels at a setpoint of 543°F and T_{avg} decreasing (with an allowable setpoint value $\geq 541^{\circ}\text{F}$)	Allows manual block of safety injection actuation on high steam line flow and low steam line pressure. Causes steam line isolation on high steam flow. Affects steam dump blocks.

TABLE 3.3-4

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
1. SAFETY INJECTION		
a. Manual Initiation	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Containment Pressure--High	≤ 4.0 psig	≤ 4.5 psig
d. Pressurizer Pressure--Low	≥ 1765 psig	≥ 1755 psig
e. Differential Pressure Between Steam Lines--High	≤ 100 psi	≤ 112 psi
f. Steam Flow in Two Steam Lines--High Coincident with T _{avg} --Low-Low or Steam Line Pressure--Low	<p>≤ A function defined as follows: A Δp corresponding to 40% of full steam flow between 0% and 20% load and then a Δp increasing linearly to a Δp corresponding to 110% of full steam flow at full load</p> <p>T_{avg} ≥ 543°F ≥ 600 psig steam line pressure</p>	<p>≤ A function defined as follows: A Δp corresponding to 44% of full steam flow between 0% and 20% load and then a Δp increasing linearly to a Δp corresponding to 111.5% of full steam flow at full load</p> <p>T_{avg} ≥ 541°F ≥ 579 psig steam line pressure</p>

TABLE J.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
2. CONTAINMENT SPRAY		
a. Manual Initiation	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Containment Pressure--High-High	≤ 15.0 psig	≤ 16.0 psig
3. CONTAINMENT ISOLATION		
a. Phase "A" Isolation		
1. Manual	Not Applicable	Not Applicable
2. From Safety Injection Automatic Actuation Logic	Not Applicable	Not Applicable
b. Phase "B" Isolation		
1. Manual	Not Applicable	Not Applicable
2. Automatic Actuation Logic	Not Applicable	Not Applicable
3. Containment Pressure--High-High	≤ 15.0 psig	≤ 16.0 psig
c. Containment Ventilation Isolation		
1. Manual	Not Applicable	Not Applicable
2. Automatic Actuation Logic	Not Applicable	Not Applicable

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
3. Containment Atmosphere Gaseous Radioactivity		Per Table 3.3-6
4. STEAM LINE ISOLATION		
a. Manual	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Containment Pressure--High-High	≤ 15.0 psig	≤ 16.0 psig
d. Steam Flow in Two Steam Lines--High Coincident with T _{avg} -- Low-Low or Steam Line Pressure--Low	<p>≤ A function defined as follows: A Δp corresponding to 40% of full steam flow between 0% and 20% load and then a Δp increasing linearly to a Δp corresponding to 110% of full steam flow at full load.</p> <p>T_{avg} ≥ 543°F ≥ 600 psig steam line pressure</p>	<p>≤ A function defined as follows: A Δp corresponding to 44% of full steam flow between 0% and 20% load and then a Δp increasing linearly to a Δp corresponding to 111.5% of full steam flow at full load.</p> <p>T_{avg} ≥ 541°F ≥ 579 psig steam line pressure</p>
5. TURBINE TRIP AND FEEDWATER ISOLATION		
a. Safety Injection	Refer to Functional Unit 1 for all initiation functions and requirements.	
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Steam Generator Water Level--High-High	≤ 67% of narrow range instrument span each steam generator	≤ 68% of narrow range instrument span each steam generator
6. SAFEGUARDS EQUIPMENT CONTROL SYSTEM (SEC)	Not Applicable	Not Applicable

TABLE 3.3-4

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
7. UNDERVOLTAGE, VITAL BUS		
a. Loss of Voltage	≥ 70% of bus voltage	≥ 65% of bus voltage
b. Sustained Degraded Voltage	≥ 94.6% of bus voltage for ≤ 13 seconds	≥ 94% of bus voltage for ≤ 15 seconds
8. AUXILIARY FEEDWATER		
a. Automatic Actuation Logic	Not Applicable	Not Applicable
b. NOT USED		
c. Steam Generator Water Level-- Low-Low	≥ 14.0% of narrow range instrument span each steam generator	≥ 13.0% of narrow range instrument span each steam generator
d. Undervoltage - RCP	≥ 70% RCP bus voltage	≥ 65% RCP bus voltage
e. S.I.	See 1 above (all S.I. setpoints)	
f. Trip of Main Feedwater Pump	Not Applicable	Not Applicable
g. Station Blackout	See 6 and 7 above (SEC and Undervoltage, Vital Bus)	
9. SEMIAUTOMATIC TRANSFER TO RECIRCULATION		
a. RWST Low Level	15.25 ft. above Instrument taps	15.25 ± 1 ft. above instrument taps
b. Automatic Actuation Logic	Not Applicable	Not Applicable

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TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK⁽⁷⁾</u>	<u>CHANNEL CALIBRATION⁽⁷⁾</u>	<u>CHANNEL FUNCTIONAL TEST⁽⁷⁾</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
1. SAFETY INJECTION				
a. Manual Initiation	N.A.	N.A.		1,2,3,4
b. Automatic Actuation Logic	N.A.	N.A.	(2)	1,2,3,4
c. Containment Pressure--High			(3)	1,2,3
d. Pressurizer Pressure--Low				1,2,3
e. Differential Pressure Between Steam Lines--High				1,2,3
f. Steam Flow in Two Steam Lines--High Coincident with Tavg--Low-Low or Steam Line Pressure--Low				1,2,3
2. CONTAINMENT SPRAY				
a. Manual Initiation	N.A.	N.A.		1,2,3,4
b. Automatic Actuation Logic	N.A.	N.A.	(2)	1,2,3,4
c. Containment Pressure--High-High			(3)	1,2,3

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK⁽⁷⁾</u>	<u>CHANNEL CALIBRATION⁽⁷⁾</u>	<u>CHANNEL FUNCTIONAL TEST⁽⁷⁾</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
3. CONTAINMENT ISOLATION				
a. Phase "A" Isolation				
1) Manual	N.A.	N.A.		1,2,3,4
2) From Safety Injection Automatic Actuation Logic	N.A.	N.A.	(2)	1,2,3,4
b. Phase "B" Isolation				
1) Manual	N.A.	N.A.		1,2,3,4
2) Automatic Actuation Logic	N.A.	N.A.	(2)	1,2,3,4
3) Containment Pressure-High-High			(3)	1,2,3
c. Containment Ventilation Isolation				
1) Manual	N.A.	N.A.		1,2,3,4
2) Automatic Actuation Logic	N.A.	N.A.	(2)	1,2,3,4
3) Containment Atmosphere Gaseous Radioactivity- High	Per Surveillance Requirement 4.3.3.1			

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK⁽⁷⁾</u>	<u>CHANNEL CALIBRATION⁽⁷⁾</u>	<u>CHANNEL FUNCTIONAL TEST⁽⁷⁾</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
4. STEAM LINE ISOLATION				
a. Manual	N.A.	N.A.		1,2 ^(a) ,3 ^{**^(a)}
b. Automatic Actuation Logic	N.A.	N.A.	(2)	1,2 ^(a) ,3 ^(a)
c. Containment Pressure-- High-High			(3)	1,2 ^(a) ,3 ^(a)
d. Steam Flow in Two Steam Lines--High Coincident with T _{avg} --Low- Low or Steam Line Pressure-- Low				1,2 ^(a) ,3 ^(a)
5. TURBINE TRIP AND FEEDWATER ISOLATION				
a. Safety Injection	Refer to Functional Unit 1 for all initiation functions and requirements. The applicability exceptions of footnote (b) also apply to Functional Unit 5.a.			
b. Automatic Actuation Logic	N.A.	N.A.	(2)	1,2 ^(b) ,3 ^(b)
c. Steam Generator Water Level--High-High				1,2 ^(b) ,3 ^(b)
6. SAFEGUARDS EQUIPMENT CONTROL SYSTEM (SEC) LOGIC				
a. Inputs	N.A.	N.A.	(6)	1,2,3,4
b. Logic, Timing and Outputs *	N.A.	N.A.	(1)	1,2,3,4
7. UNDERVOLTAGE, VITAL BUS				
a. Loss of Voltage				1,2,3
b. Sustained Degraded Voltage				1,2,3

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK⁽⁷⁾</u>	<u>CHANNEL CALIBRATION⁽⁷⁾</u>	<u>CHANNEL FUNCTIONAL TEST⁽⁷⁾</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
8. AUXILIARY FEEDWATER				
a. Automatic Actuation Logic	N.A.	N.A.	(2)	1,2,3
b. NOT USED				
c. Steam Generator Water Level--Low-Low				1,2,3
d. Undervoltage - RCP				1,2
e. S.I.	See 1 above (All S.I. surveillance requirements)			
f. Trip of Main Feedwater Pumps	N.A.	N.A.		1,2
g. Station Blackout	See 6 and 7 above (SEC and U/V Vital Bus)			
9. SEMIAUTOMATIC TRANSFER TO RECIRCULATION				
a. RWST Low Level				1,2,3
b. Automatic Initiation Logic	N.A.	N.A.	(2)	1,2,3,4

TABLE 4.3-2 (Continued)

TABLE NOTATION

- * Outputs are up to, but not including, the Output Relays.
- ** The provisions of Specification of 4.0.4 are not applicable.
- (1) Each logic channel shall be tested in accordance with the Surveillance Frequency Control Program. The CHANNEL FUNCTIONAL TEST of each logic channel shall verify that its associated diesel generator automatic load sequence timer is OPERABLE with the interval between each load block within 1 second of its design interval.
- (2) Each train or logic channel shall be tested in accordance with the Surveillance Frequency Control Program.
- (3) The CHANNEL FUNCTIONAL TEST shall include exercising the transmitter by applying either a vacuum or pressure to the appropriate side of the transmitter.
- (4) NOT USED
- (5) NOT USED
- (6) Inputs from undervoltage, Vital Bus, shall be tested in accordance with the Surveillance Frequency Control Program. Inputs from Solid State Protection System, shall be tested in accordance with the Surveillance Frequency Control Program.
- (7) Frequencies are specified in the Surveillance Frequency Control Program unless otherwise noted in the table.

- (a) Except when all MSIVs are closed.
- (b) Except when all main feedwater lines are isolated by (1) a closed and de-activated feedwater isolation valve, or (2) closed and de-activated feedwater regulating valve (FRV) and FRV bypass valves, or (3) a closed manual valve.

INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

RADIATION MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.1 The radiation monitoring instrumentation channels shown in Table 3.3-6 shall be OPERABLE with their alarm/trip setpoints within the specified limits.

APPLICABILITY: As shown in Table 3.3-6.

ACTION:

- a. With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.
- b. With one or more radiation monitoring channels inoperable, take the ACTION shown in Table 3.3-6.
- c. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.1 Each radiation monitoring instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations in accordance with the Surveillance Frequency Control Program.

TABLE 3.3-6
RADIATION MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ALARM/TRIP SETPOINT</u>	<u>MEASUREMENT RANGE</u>	<u>ACTION</u>
1. AREA MONITORS					
a. Fuel Storage Area	1	*	≤15 mR/hr	10 ⁻¹ -10 ⁴ mR/hr	23
2. PROCESS MONITORS					
a. Containment					
1) Gaseous Activity					
a) Purge & Pressure Vacuum Relief Isolation	1#	1,2,3,4&5	per ODCM Control 3.3.3.9	10 ¹ -10 ⁶ cpm	26
b) RCS Leakage Detection	1	1,2,3&4	N/A	10 ¹ -10 ⁶ cpm	24
2) Air Particulate Activity					
a) (NOT USED)					
b) RCS Leakage Detection	1	1,2,3&4	N/A	10 ¹ -10 ⁶ cpm	24

* With fuel in the storage pool or building.

The plant vent noble gas monitor may also function in this capacity when the purge/pressure-vacuum relief isolation valves are open.

TABLE 3.3-6 (Continued)
RADIATION MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ALARM/TRIP SETPOINT</u>	<u>MEASUREMENT RANGE</u>	<u>ACTION</u>
2. PROCESS MONITORS					
b. Noble Gas Effluent Monitors					
1) Medium Range Auxiliary Building Exhaust System (Plant Vent)	1	1,2,3&4	$\leq 3.0 \times 10^{-2} \mu\text{Ci}/\text{cm}^3$ (Alarm only)	$10^{-3} - 10^1 \mu\text{Ci}/\text{cm}^3$	26
2) High Range Auxiliary Building Exhaust System (Plant Vent)	1	1,2,3&4	$\leq 1.0 \times 10^2 \mu\text{Ci}/\text{cm}^3$ (Alarm only)	$10^{-1} - 10^5 \mu\text{Ci}/\text{cm}^3$	26
3) Condenser Exhaust System	1	1,2,3&4	$\leq 7.12 \times 10^4 \text{ cpm}$ (Alarm only)	$1 - 10^6 \text{ cpm}$	26
3. CONTROL ROOM					
a. Air Intake - Radiation Level	2/Intake##	**	$\leq 2.48 \times 10^3 \text{ cpm}$	$10^1 - 10^7 \text{ cpm}$	27,28

Control Room air intakes shared between Unit 1 and 2.

** ALL MODES and during movement of irradiated fuel assemblies and during CORE ALTERATIONS.

TABLE 3.3-6 (Continued)

TABLE NOTATION

- ACTION 23 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.
- ACTION 24 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.7.1.
- ACTION 25 - (Not Used)
- ACTION 26 - With the number of OPERABLE Channels less than required by the Minimum Channels OPERABLE requirements, initiate the preplanned alternate method of monitoring the appropriate parameter(s), within 72 hours, and:
- 1) either restore the inoperable Channel(s) to OPERABLE status within 7 days of the event, or
 - 2) prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.
- ACTION 27 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel(s) to OPERABLE status within 7 days or initiate and maintain operation of the Control Room Emergency Air Conditioning System (CREACS) in the pressurization or recirculation mode of operation. CORE ALTERATIONS and movement of irradiated fuel assemblies will be suspended during operation in the recirculation mode.
- ACTION 28 - With no channels OPERABLE in a Control Room air intake, immediately initiate and maintain operation of the CREACS in the pressurization or recirculation mode of operation. CORE ALTERATIONS and movement of irradiated fuel assemblies will be suspended during operation in the recirculation mode.

TABLE 4.3-3
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INSTRUMENTATION

REMOTE SHUTDOWN INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.5 The remote shutdown monitoring instrumentation channels shown in Table 3.3-9 shall be OPERABLE with readouts displayed external to the control room.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

- a. With the number of OPERABLE remote shutdown monitoring channels less than required by Table 3.3-9, restore the inoperable channel to OPERABLE status within 7 days or be in HOT SHUTDOWN within the next 12 hours.

SURVEILLANCE REQUIREMENTS

4.3.3.5 Each remote shutdown monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, and CHANNEL CALIBRATION operations in accordance with the Surveillance Frequency Control Program.

TABLE 3.3-9REMOTE SHUTDOWN MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>READOUT LOCATION</u>	<u>MEASUREMENT RANGE</u>	<u>MINIMUM CHANNELS OPERABLE</u>
1. Pressurizer Pressure	Hot Shutdown Panel 213	1700-2500 psig	1
2. Pressurizer Level	Hot Shutdown Panel 213	0 - 100%	1
3. Steam Generator Pressure	Hot Shutdown Panel 213	0 - 1200 psig	1/steam generator
4. Steam Generator Level	Hot Shutdown Panel 213	0 - 100%	1/steam generator

TABLE 4.3-6
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SALEM - UNIT 2

3/4 3-46 through 3-49

Amendment No. 117

JAN 5 1993

INSTRUMENTATION

ACCIDENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.7 The accident monitoring instrumentation channels shown in Table 3.3-11 shall be operable.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

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

- a. As shown in Table 3.3-11.

SURVEILLANCE REQUIREMENTS

4.3.3.7 Each accident monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations at the frequencies specified in the Surveillance Frequency Control Program unless otherwise noted in Table 4.3-11.

TABLE 3.3-11

ACCIDENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>REQUIRED NO. OF CHANNELS</u>	<u>MINIMUM NO. OF CHANNELS</u>	<u>ACTION</u>
1. Reactor Coolant Outlet Temperature - T _{HOT} (Wide Range)	2	1	1, 2
2. Reactor Coolant Inlet Temperature - T _{COLD} (Wide Range)	2	1	1, 2
3. Reactor Coolant Pressure (Wide Range)	2	1	1, 2
4. Pressurizer Water Level	2	1	1, 2
5. Steam Line Pressure	2/Steam Generator	1/Steam Generator	1, 2
6. Steam Generator Water Level (Narrow Range)	2/Steam Generator	1/Steam Generator	1, 2
7. Steam Generator Water Level (Wide Range)	4 (1/Steam Generator)	3 (1/Steam Generator)	1, 2
8. Refueling Water Storage Tank Water Level	2	1	1, 2
9. deleted			
10. Auxiliary Feedwater Flow Rate	4 (1/Steam Generator)	3 (1/Steam Generator)	4, 6
11. Deleted			
12. Deleted			

TABLE 3.3-11 (Continued)

ACCIDENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>REQUIRED NO. OF CHANNELS</u>	<u>MINIMUM NO. OF CHANNELS</u>	<u>ACTION</u>
13. Deleted			
14. Deleted			
15. Deleted			
16. Containment Pressure - Wide Range	2	1	7, 2
17. Containment Water Level - Wide Range	2	1	7, 2
18. Core Exit Thermocouples	4/core quadrant	2/core quadrant	1, 2
19. Reactor Vessel Level Instrumentation System (RVLIS)	2	1	8, 9
20. Containment High Range Accident Radiation Monitor	2	2	10
21. Main Steamline Discharge (Safety Valves and Atmospheric Steam Dumps) Monitor	1/MS Line	1/MS Line	10
22. Wide Range Neutron Flux Monitors	2	1	1, 2
23. Auxiliary Feed Water Storage Tank (Condensate Storage Tank) Water Level	2	1	1, 2
24. Containment Isolation Valve Position Indication	2 per penetration flow path ^{(a)(b)}	1/valve ^(c)	1, 2

(a) Not required for isolation valves whose associated penetration is isolated by at least one closed and deactivated valve, closed manual valve, blind flange, or check valve with flow through the valve secured.

(b) Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.

(c) Action 2 not required for penetration flow paths with only one installed control room indication channel.

TABLE 3.3-11 (continued)

TABLE NOTATION

- ACTION 1 With the number of OPERABLE accident monitoring channels less than the Required Number of Channels shown in Table 3.3-11, restore the inoperable channel(s) to OPERABLE status within 30 days, or submit a special report in accordance with Specification 6.9.4.
- ACTION 2 With the number of OPERABLE accident monitoring channels less than the Minimum Number of Channels shown in Table 3.3-11, restore the inoperable channel(s) to OPERABLE status within 7 days or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- ACTION 3 deleted
- ACTION 4 With the number of OPERABLE channels one less than the Required Number of Channels shown in Table 3.3-11, operations may proceed provided that an OPERABLE Steam Generator Wide Range Level channel is available as an alternate means of indication for the Steam Generator with no OPERABLE Auxiliary Feedwater Flow Rate Channel; otherwise, restore the inoperable channel to OPERABLE status within 30 days, or submit a special report in accordance with Specification 6.9.4.
- ACTION 5 deleted

TABLE 3.3-11 (continued)

TABLE NOTATION

- ACTION 6 With the number of OPERABLE channels less than the Minimum Number of channels shown in Table 3.3-11, restore the inoperable channel(s) to OPERABLE status within 7 days, or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- ACTION 7 With the number of OPERABLE channels one less than the Required Number of Channels shown in Table 3.3-11, operation may proceed until the next CHANNEL CALIBRATION (which shall be performed upon the next entry into MODE 5, COLD SHUTDOWN).
- ACTION 8 With one RVLIS channel inoperable, restore the RVLIS channel to OPERABLE status within 30 days, or submit a special report in accordance with Specification 6.9.4.
- ACTION 9 With both RVLIS channels inoperable, restore one channel to OPERABLE status within 7 days or submit a special report in accordance with Specification 6.9.4.
- ACTION 10 With the number of OPERABLE Channels less than required by the minimum channels OPERABLE requirements, initiate the preplanned alternate method of monitoring the appropriate parameter within 72 hours, and:
- 1) either restore the inoperable Channel(s) to OPERABLE status within 7 days of the event, or
 - 2) prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 14 days following the event outlining the actions taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

TABLE 4.3-11
SURVEILLANCE REQUIREMENTS FOR
ACCIDENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>CHANNEL CHECKS⁽¹⁾</u>	<u>CHANNEL CALIBRATION⁽¹⁾</u>	<u>CHANNEL FUNCTIONAL TEST⁽¹⁾</u>
1. Reactor Coolant Outlet Temperature - T _{HOT} (Wide Range)			N.A.
2. Reactor Coolant Inlet Temperature - T _{COLD} (Wide Range)			N.A.
3. Reactor Coolant Pressure (Wide Range)			N.A.
4. Pressurizer Water Level			N.A.
5. Steam Line Pressure			N.A.
6. Steam Generator Water Level (Narrow Range)			N.A.
7. Steam Generator Water Level (Wide Range)			N.A.
8. Refueling Water Storage Tank Water Level			N.A.
9. deleted			
10. Auxiliary Feedwater Flow Rate	S/U#		N.A.
11. Deleted			

Auxiliary Feedwater System is used on each startup and flow rate indication is verified at that time.

TABLE 4.3-11 (Continued)
SURVEILLANCE REQUIREMENTS FOR
ACCIDENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>CHANNEL CHECKS⁽¹⁾</u>	<u>CHANNEL CALIBRATION⁽¹⁾</u>	<u>CHANNEL FUNCTIONAL TEST⁽¹⁾</u>
12. Deleted			
13. Deleted			
14. Deleted			
15. Deleted			
16. Containment Pressure - Wide Range			N.A.
17. Containment Water Level - Wide Range			N.A.
18. Core Exit Thermocouples			N.A.
19. Reactor Vessel Level Instrumentation System (RVLIS)			N.A.
20. Containment High Range Accident Radiation monitor			
21. Main Steamline Discharge (Safety Valves and Atmospheric Steam Dumps) Monitor			
22. Wide Range Neutron Flux Monitors			N.A.
23. Auxiliary Feed Water Storage Tank (Condensate Storage Tank) Water Level			N.A.
24. Containment Isolation Valve Position Indication			N.A.

Table Notation

- (1) Frequencies are specified in the Surveillance Frequency Control Program unless otherwise noted in the table.

INSTRUMENTATION

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.8 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.3-12 shall be OPERABLE to ensure that the limits of ODCM Control 3.11.1.1 are not exceeded.

APPLICABILITY: At all times.

ACTION:

- a. Not Used
- b. With less than the minimum number of radioactive liquid effluent monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 3.3-12. Exert best efforts to return the instrument to OPERABLE status within 30 days and, if unsuccessful, explain in the next annual radioactive effluent release report why the inoperability was not corrected in a timely manner.
- c. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.8 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST operations at the frequencies specified in the Surveillance Frequency Control Program unless otherwise noted in Table 4.3-12.

TABLE 3.3-12

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>ACTION</u>
1. Not Used		
2. Not Used		
3. Not Used		
4. TANK LEVEL INDICATING DEVICES		
a. Temporary Outside Storage Tanks as Required	1	30

TABLE NOTATION

ACTION 26 - Not Used

ACTION 27 - Not Used

ACTION 28 - Not Used

ACTION 29 - Not Used

ACTION 30 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, liquid additions to this tank may continue for up to 30 days provided the tank liquid level is estimated during all liquid additions to the tank.

ACTION 31 - Not Used

TABLE 4.3-12
RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK⁽¹⁾</u>	<u>SOURCE CHECK⁽¹⁾</u>	<u>CHANNEL CALIBRATION⁽¹⁾</u>	<u>CHANNEL FUNCTIONAL TEST⁽¹⁾</u>
1. Not Used				
2. Not Used				
3. Not Used				
4. TANK LEVEL INDICATING DEVICES**				
a. Temporary Outside Storage Tanks as Required	D*	N.A.		

TABLE NOTATION

- * During liquid additions to the tank.
- ** If tank level indication is not provided, verification will be done by visual inspection.
- (1) Frequencies are specified in the Surveillance Frequency Control Program unless otherwise noted in the table.

Pages 3/4 3-57 through 3/4 3-64 Deleted

INSTRUMENTATION

POWER DISTRIBUTION MONITORING SYSTEM

LIMITING CONDITION FOR OPERATION

3.3.3.14 The Power Distribution Monitoring System (PDMS) shall be OPERABLE with:

a. A minimum of the following inputs from the plant available for use by the PDMS as defined in Table 3.3-14.

1. Control Bank Position
2. T_{cold}
3. Reactor Power Level
4. NIS Power Range Detector Section Signals

b. Core Exit Thermocouples (T/C) meeting the criteria:

1. At least 25% operable T/C with at least 2 T/C per quadrant, and
2. The T/C pattern has coverage of all interior fuel assemblies (no face along the baffle), within a chess knight's move, radially, from a responding, calibrated T/C, or
3. At least 25%, operable T/C with at least 2 T/C per quadrant, and the installed PDMS calibration was determined within the last 31 Effective Full Power Days (EFPD).
4. The T/C temperatures used by the PDMS are calibrated via cross calibration with the loop temperature measurement RTDs, and using the T/C flow mixing factors determined during installed PDMS calibration.

c. An installed PDMS calibration satisfying the criteria:

1. The initial calibration in each operating cycle is determined using measurements from at least 75% of the incore movable detector thimbles obtained at a THERMAL POWER greater than 25% of RATED THERMAL POWER.
2. The calibration is determined using measurements from at least 50% of the incore movable detector thimbles at any time except as specified in 3.3.3.14.c.1, and
3. The calibration is determined using a minimum of 2 detector thimbles per core quadrant.

INSTRUMENTATION

POWER DISTRIBUTION MONITORING SYSTEM

LIMITING CONDITION FOR OPERATION (Continued)

APPLICABILITY: MODE 1, above 25% RATED THERMAL POWER (RTP)

ACTION:

With any of the operability criteria listed in 3.3.3.14.a, 3.3.3.14.b, or 3.3.3.14.c not met, either correct the deficient operability condition, or declare the PDMS inoperable and use the incore movable detector system to obtain any required core power distribution measurements. Increase the measured core peaking factors using the values listed in the COLR for the PDMS inoperable condition.

The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.14.1 The operability criteria listed in 3.3.3.14.a, 3.3.3.14.b, and 3.3.3.14.c shall be verified to be satisfied prior to acceptance of the PDMS core power distribution measurement results.

4.3.3.14.2 Calibration of the PDMS is required:

- a. In accordance with the Surveillance Frequency Control Program when the minimum number and core coverage criteria as defined in 3.3.3.14.b.1 and 3.3.3.14.b.2 are satisfied, or
- b. In accordance with the Surveillance Frequency Control Program when only the minimum number criterion as defined in 3.3.3.14.b.3 is satisfied.

INSTRUMENTATION

TABLE 3.3-14

REQUIRED PDMS PLANT INPUT INFORMATION

PLANT INPUT INFORMATION	AVAILABLE INPUTS	MINIMUM NO. OF VALID INPUTS	APPLICABLE MODES
Control Bank Position	4	4 ^a	1 ^c
T _{cold}	4	2	1 ^c
Reactor Power Level	3	1 ^b	1 ^c
NIS Power Range Excore Detector Section Signals	8	6 ^d	1 ^c

TABLE NOTATIONS

- a. Determined from either valid Demand Position or the average of the valid individual RCCA position indications for all RCCAs in the Control Bank.
- b. Determined from either the reactor THERMAL POWER derived using a valid secondary calorimetric measurement, the average NIS Power Range Detector Power, or the average RCS Loop ΔT .
- c. Greater than 25% RTP.
- d. Comprised of an upper and lower detector section signal per Power Range Channel; a minimum of 3 OPERABLE channels required.