ATTACHMENT B

MARKED-UP TECHNICAL SPECIFICATIONS

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B 2-6	B2-6	3/4 8-12a	-----
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BASES

DELETED

2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS

2.2.1 The Reactor Trip System Instrumentation and Interlock Setpoints shall be set consistent with the Trip Setpoint values shown in Table 2.2-1.

APPLICABILITY: As shown for each channel in Table 3.3-1.

ACTION:

a. With a Reactor Trip System Instrumentation or Interlock Setpoint less conservative than the value shown in the Trip Setpoint column but more conservative than the value shown in the Allowable Value column of Table 2.2-1, adjust the Setpoint consistent with the Trip Setpoint value. (S)

b. With a Reactor Trip System Instrumentation or Interlock Setpoint less conservative than the value shown in the Allowable Values column of Table 2.2-1, declare the channel inoperable and apply the applicable ACTION statement requirement of Specification 3.3.1 until the channel is restored to OPERABLE status with its Setpoint adjusted consistent with the Trip Setpoint value. (S)

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TABLE 2.. (Continued)

REACTOR TRIP SYSTEM I[illegible]MENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
13. Steam Generator Water Level-Low-Low	≥ 7.2% of narrow range instrument span-each steam generator	≥ 6.8% of narrow range instrument span-each steam generator
Coincident with:		
a. RCS Loop ΔT Equivalent to Power ≤50% RTP	RCS Loop ΔT variable input ≤50% RTP	RCS Loop ΔT variable input ≤51.5% RTP
With a time delay (TD)	≤TD (Note 5)	≤(1.01)TD (Note 5)
~~or~~ Or		
b. RCS Loop ΔT Equivalvent to Power >50% RTP	RCS Loop ΔT variable input >50% RTP	RCS Loop ΔT variable input >51.5% RTP
With no time delay	TD = 0	TD = 0
14. DELETED		
15. Undervoltage-Reactor Coolant Pumps	≥ 8050 volts-each bus	≥ 7730 volts-each bus
16. Underfrequency-Reactor Coolant Pumps	≥ 54.0 Hz - each bus	≥ 53.9 Hz - each bus
17. Turbine Trip		
a. Low Autostop Oil Pressure	≥ 50 psig	≥ 45 psig
b. Turbine Stop Valve Closure	≥ 1% open	≥ 1% open
18. Safety Injection Input from ESF	N.A.	N.A.
19. Reactor Coolant Pump Breaker Position Trip	N.A.	N.A.
20. Reactor Trip Breakers	N.A.	N.A.
21. Automatic Trip and Interlock Logic	N.A.	N.A.

Amendment Nos. ~~72 & 71~~ 84 and 83
Effective Cycle 7

TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

TABLE NOTATIONS

NOTE 3: OVERPOWER ΔT

$$\Delta T\left(\frac{1+\tau_4 S}{1+\tau_5 S}\right) \leq \Delta T_o\{K_4 - K_5 \left(\frac{\tau_3 S}{1+\tau_3 S}\right) T - K_6 [T-T"] - f_2(\Delta I)\}$$

Where: $\frac{1+\tau_4 S}{1+\tau_5 S}$ = Lead-lag compensator on measured ΔT

τ_4, τ_5 = Time constants utilized in the lead-lag controller for ΔT, $\tau_4 = 0$ seconds, $\tau_5 = 0$ seconds

ΔT_o = Indicated ΔT at RATED THERMAL POWER

$K_4 = 1.072$

K_5 = 0.0174/°F for increasing average temperature, and 0 for decreasing average temperature

$\frac{\tau_3 S}{1+\tau_3 S}$ = The function generated by the rate-lag controller for T_{avg} dynamic compensation

τ_3 = Time constants utilized in the rate-lag controller for T_{avg}, $\tau_3 = 10$ secs.

5 K_6 = 0.0014/°F for $T > T"$, and 0 for $T \leq T"$

T = Average temperature, °F

$T"$ = Indicated T_{avg} at RATED THERMAL POWER

S = Laplace transform operator, s^{-1}

$f_2(\Delta I) = 0$ for all ΔI

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TABLE 2.2-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

TABLE NOTATIONS

NOTE 4: The channel's maximum Trip Setpoint shall not exceed its computed Trip Setpoint by more than 1.0% ΔT span

NOTE 5: Steam Generator Water Level Low-Low Trip Time Delay

$$TD = [B1(P)^3 + B2(P)^2 + B3(P) + B4][0.99]$$

Where: P = RCS Loop ΔT Equivalent to Power (%RTP), P ≤ 50% RTP

TD = Time delay for Steam Generator Water Level Low-Low Reactor Trip (in seconds).

B1 = -0.0072
B2 = +0.8181
B3 = -31.72
B4 = +468.8

B1 = -0.007128
B2 = +0.8099
B3 = -31.40
B4 = +464.1

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Reactor Coolant Flow

The Low Reactor Coolant Flow trips provide core protection to prevent DNB by mitigating the consequences of a loss of flow resulting from the loss of one or more reactor coolant pumps.

On increasing power above P-7 (a power level of approximately 10% of RATED THERMAL POWER or a turbine impulse chamber pressure at approximately 10% of full power equivalent), an automatic Reactor trip will occur if the flow in more than one loop drops below 90% of nominal full loop flow. Above P-8 (a power level of approximately 35% of RATED THERMAL POWER) an automatic Reactor trip will occur if the flow in any single loop drops below 90% of nominal full loop flow. Conversely on decreasing power between P-8 and P-7 an automatic reactor trip will occur on loss of flow in more than one loop and below P-7 the trip function is automatically blocked.

Overtemperature ΔT

The Overtemperature ΔT trip provides core protection to prevent DNB for all combinations of pressure, power, coolant temperature, and axial power distribution, provided (1) that the transient is slow with respect to delays associated with fluid transport from the core to the loop temperature detectors (RTDs), and thermowell and RTD response time delays, and (2) pressure is within the range between the Pressurizer High and Low Pressure trips. The Setpoint is automatically varied with: (1) coolant temperature to correct for temperature induced changes in density and heat capacity of water and includes dynamic compensation for ~~piping delays~~ from the core to the loop temperature detectors, (2) pressurizer pressure, and (3) axial power distribution. With normal axial power distribution, this Reactor trip limit is always below the core Safety Limit as shown in Figure 2.1-1. If axial peaks are greater than design, as indicated by the difference between top and bottom power range nuclear detectors, the Reactor trip is automatically reduced according to the notations in Table 2.2-1.

transport and thermowell delays

Delta-T_o, as used in the Overtemperature and Overpower ΔT trips, represents the 100% RTP value as measured by the plant for each loop. This normalizes each loop's ΔT trips to the actual operating conditions existing at the time of measurement, thus forcing the trip to reflect the equivalent full power conditions as assumed in the accident analyses. These differences in RCS loop ΔT can be due to several factors, e.g., measured RCS loop flows greater than minimum measured flow, and slightly asymmetric power distributions between quadrants. While RCS loop flows are not expected to change with cycle life, radial power redistribution between quadrants may occur, resulting in small changes in loop specific ΔT values. Accurate determination of the loop specific ΔT value should be made when performing Incore/Excore quarterly recalibration and under steady state conditions (i.e., power distributions not affected by xenon or other transient conditions).

Steam Generator Water Level

The Steam Generator Water Level Low-Low trip protects the reactor from loss of heat sink in the event of a sustained steam/feedwater flow mismatch resulting from loss of normal feedwater or a feedwater system pipe break, inside or outside containment. This function also provides input to the steam generator level control system. IEEE 279 requirements are satisfied by 2/3 logic for protection function actuation, thus allowing for a single failure of a channel and still performing the protection function. Control/protection interaction is addressed by the use of the Median Signal Selector which prevents a single failure of a channel providing input to the control system requiring protection function action. That is, a single failure of a channel providing input to the control system does not result in the control system initiating a condition requiring protection function action. The Median Signal Selector performs this by not selecting the channels indicating the highest or lowest steam generator levels as input to the control system.

The Trip Time Delay (TTD) creates additional operational margin when the plant needs it most, during early escalation to power, by allowing the operator time to recover level when the primary side load is sufficiently small to allow such action. The TTD is based on continuous monitoring of primary side power through the use of RCS loop ΔT. The magnitude of the..... delays decreases with increasing primary side power level, up to 50% RTP. Above 50% RTP there are no time delays for the Low-Low Level trips.

In the event of failure of a Steam Generator Water Level channel, the channel is placed in the trip condition as input to the Solid State Protection System and does not affect the TTD setpoint calculations for the remaining OPERABLE channels. Failure of the RCS loop ΔT channel input ~~to the TTD does~~ not affect the TTD calculation for a protection set. This results in the requirement that the operator adjust the threshold power level for zero seconds time delay from 50% RTP to 0% RTP, through the Man Machine Interface.

either

, or the affected Steam Generator Water Level channels be placed in the tripped condition.

Undervoltage and Underfrequency - Reactor Coolant Pump Busses

The Undervoltage and Underfrequency Reactor Coolant Pump Bus trips provide core protection against DNB as a result of complete loss of forced coolant flow. The specified Setpoints assure a Reactor trip signal is generated before the Low Flow Trip Setpoint is reached. Time delays are incorporated in the Underfrequency and Undervoltage trips to prevent spurious Reactor trips from momentary electrical power transients. For undervoltage, the delay is set so that the time required for a signal to reach the Reactor trip breakers following the simultaneous trip of two or more reactor coolant pump bus circuit breakers shall not exceed 0.9 seconds. For underfrequency, the delay is set so that the time required for a signal to reach the Reactor trip breakers after the Underfrequency Trip Setpoint is reached shall not exceed 0.3 seconds. On decreasing power, the Undervoltage and Underfrequency Reactor Coolant Pump Bus trips are automatically blocked by P-7 (a power level of approximately 10% of RATED THERMAL POWER with a turbine impulse chamber pressure at approximately 10% of full power equivalent); and on increasing power, reinstated automatically by P-7.

Turbine Trip

A Turbine trip initiates a Reactor trip. On decreasing power, the Turbine trip is automatically blocked by P-9 (a power level of approximately 50% of RATED THERMAL POWER); and on increasing power, reinstated automatically by P-9.

Safety Injection Input from ESF

If a Reactor trip has not already been generated by the Reactor Trip System instrumentation, the ESF automatic actuation logic channels will initiate a Reactor trip upon any signal which initiates a Safety Injection. The ESF instrumentation channels which initiate a Safety Injection signal are shown in Table 3.3-3.

Reactor Coolant Pump Breaker Position Trip

The Reactor Coolant Pump Breaker Position trip is an anticipatory trip which provides core protection against DNB. The Open/Close Position trip assures a reactor trip signal is generated before the Low Flow Trip Setpoint is reached. No credit was taken in the safety analyses for operation of this trip. The functional capability at the open/close position settings is required to enhance the overall reliability of the Reactor Trip System. Above P-7 (a power level of approximately 10% of RATED THERMAL POWER or a turbine impulse chamber pressure at approximately 10% of full power equivalent) an automatic reactor trip will occur if more than one reactor coolant pump breaker is opened. Below P-7 the trip function is automatically blocked.

Reactor Trip System Interlocks

The Reactor Trip System Interlocks perform the following functions:

P-6 On increasing power, P-6 allows the manual block of the Source Range trip and de-energizing of the high voltage to the detectors. On decreasing power, Source Range Level trips are automatically reactivated and high voltage restored.

P-7 On increasing power, P-7 automatically enables Reactor trips on low flow in more than one reactor coolant loop, more than one reactor coolant pump breaker open, reactor coolant pump bus undervoltage and underfrequency, pressurizer low pressure and pressurizer high level. On decreasing power, the above listed trips are automatically blocked.

TABLE 3.3 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
12. Reactor Coolant Flow-Low					
a. Single Loop (Above P-8)	3/loop	2/loop in one loop	2/loop in each loop	1	6
b. Two Loops (Above P-7 and below P-8)	3/loop	2/loop in two loops	2/loop in each loop	1	6
13. Steam Generator Water Level Low-Low					
a. Steam Generator Water Level-Low-Low	3/S.G.	2/S.G. in one S.G.	2/S.G. in each S.G.	1,2	6
b. RCS Loop ΔT	4. (1/loop)	~~2~~ N.A.	~~3~~ N.A.	1,2	27
14. DELETED					
15. Undervoltage-Reactor Coolant Pumps	2/bus	1/bus both busses	1/bus	1	28
16. Underfrequency-Reactor Coolant Pumps	3/bus	2 on same bus	2/bus	1	28
17. Turbine Trip					
a. Low Autostop Oil Pressure	3	2	2	1	7
b. Turbine Stop Valve Closure	4	4	4	1	7

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TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

ACTION 9 - With less than the Minimum Number of Channels OPERABLE, operation may continue provided the inoperable channel is placed in the tripped condition within the next 6 hours.

ACTION 10 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1, provided the other channel is OPERABLE.

ACTION 11 - 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 12 - 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 apply ACTION 10. 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.

ACTION 13 - 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 Minimum Channels OPERABLE requirement is met, and

b. The inoperable channel is placed in the tripped conditions within 6 hours; however, the inoperable channel may be bypassed for up to 72 hours for surveillance testing per Specification 4.3.1.1 or for performing maintenance.

ACTION 26 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable Channel to OPERABLE status within 6 hours or be in at least 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, provided the other channel is OPERABLE.

Insert A →

ACTION 27 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delay threshold power level for zero seconds time delay is adjusted to 0% RTP.

ACTION 28 - 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 trip condition within 6 hours, and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.

Insert A

ACTION 27 - With the number of OPERABLE channels less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected RCS Loop Delta-T channel(s), either:

a. The Trip Time Delay threshold power level for zero seconds time delay is adjusted to 0% RTP, or

b. With the number of OPERABLE channels one less than the Total Number of Channels, the affected Steam Generator Water Level-Low-Low channels are placed in the tripped condition.

TABLE 3.3-2

REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME
1. Manual Reactor Trip	N.A.
2. Power Range, Neutron Flux	≤ 0.5 second (1)
3. Power Range, Neutron Flux, High Positive Rate	N.A.
4. Power Range, Neutron Flux, High Negative Rate	≤ 0.5 second (1)
5. Intermediate Range, Neutron Flux	N.A.
6. Source Range, Neutron Flux	≤ 0.5 second (1)
7. Overtemperature ΔT	≤ 7 seconds (1)
8. Overpower ΔT	≤ 7 seconds (1)
9. Pressurizer Pressure-Low	≤ 2 seconds
10. Pressurizer Pressure-High	≤ 2 seconds
11. Pressurizer Water Level-High	N.A.
12. Reactor Coolant Flow-Low	
a. Single Loop (Above P-8)	≤ 1 second
b. Two Loops (Above P-7 and below P-8)	≤ 1 second
13. Steam Generator Water Level-Low-Low	
a. Steam Generator Water Level-Low-Low	≤ 2 seconds (2)
b. RCS Loop ΔT Equivalent Power	N.A.
14. DELETED	
15. Undervoltage-Reactor Coolant Pumps	≤ 1.2 seconds
16. Underfrequency-Reactor Coolant Pumps	< 0.6 second

(1) Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input ~~of~~ to the first electronic component in channel.

(2) Does not include Trip Time Delays. Response times include the transmitters, Eagle-21 Process Protection cabinets, Solid State Protection System cabinets and actuation devices only. This reflects the response times necessary for THERMAL POWER in excess of 50% RTP.

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3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The Engineered Safety Features 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 and with RESPONSE TIMES as shown in Table 3.3-5.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

a. With an ESFAS Instrumentation Channel or Interlock Trip Setpoint less conservative than the value shown in the Trip Setpoint column but more conservative than the value shown in the Allowable Value column of Table 3.3-4, adjust the Setpoint consistent with the Trip Setpoint value.

b. With an ESFAS Instrumentation or Interlock Trip Setpoint less conservative than the value shown in the Allowable Value column of Table 3.3-4, declare the channel inoperable and apply the applicable ACTION statement requirements of Table 3.3-3 until the channel is restored to OPERABLE status with its Trip Setpoint adjusted consistent with the Trip Setpoint value.

SURVEILLANCE REQUIREMENTS

4.3.2.1 Each ESFAS instrumentation channel and interlock and the automatic actuation logic and relays shall be demonstrated OPERABLE by the performance of the Engineered Safety Feature Actuation System Instrumentation Surveillance Requirements specified in Table 4.3-2.

4.3.2.2 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be demonstrated to be within the limit at least once per 18 months. Each test shall include at least one train such that both trains are tested at least once per 36 months and one channel per function such that all channels are tested at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" column of Table 3.3-3.

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TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
3. Containment Isolation (Continued)					
2) Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	14
3) Containment Pressure-High-High	4	2	3	1, 2, 3, 4	17
c. Containment Ventilation Isolation					
1) Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	18
2) Plant Vent Noble Gas Activity-High (RM-14A and 14B)(a)	2	1	2	1, 2, 3, 4	18
3) Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				
4) Containment Ventilation Exhaust Radiation-High (RM-44A and 44B)(b)	2	1	2	1, 2, 3, 4	18
4. Steam Line Isolation					
a. Manual	1 manual switch/steam line	1 manual switch/steam line	1 manual switch/ operating steam line	1, 2, 3, 4	24

Deleted

(a) The requirements for Plant Vent Noble Gas Activity-High (RM-14A and 14B) are not applicable following installation of RM-44A and 44B.
(b) The requirements for Containment Ventilation Exhaust Radiation-High (RM-44A and 44B) are applicable following installation of RM-44A and 44B.

Amendment Nos. 89 and 88
March 2, 1994

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
6. Auxiliary Feedwater					
a. Manual Initiation	1 manual switch/pump	1 manual switch/pump	1 manual switch/pump	1, 2, 3	24
b. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3	22
c. Stm. Gen. Water Level-Low-Low					
1) Start Motor-Driven Pumps					
a. Steam Generator Water Level-Low-Low	3/S.G.	2/S.G. in one S.G	2/S.G. in each S.G.	1, 2, 3 ###	20
b. RCS Loop ΔT	4 (1/loop)	~~2~~ N.A.	~~3~~ N.A.	1, 2, ~~3~~	29
2) Start Turbine-Driven Pump					
a. Steam Generator Water Level-Low-Low	3/S.G.	2/S.G. in any 2 S.G.	2/S.G. in each S.G.	1, 2, 3 ####	20
b. RCS loop ΔT	4 (1/loop)	~~2~~ N.A.	~~3~~ N.A.	1, 2, ~~3~~	29
d. Undervoltage-RCP Bus Start Turbine-Driven Pump	2/bus	1/bus on both busses	1/bus	1	35
e. Safety Injection Start Motor-Driven Pumps	See Item 1. above for all Safety Injection initiating functions and requirements.				

Amendment Nos. 92 and 91
April 1, 1994

TABLE 3.3-3 (Continued)

TABLE NOTATIONS

Trip function may be blocked in this MODE below the P11 (Pressurizer Pressure Interlock) Setpoint.

Trip function automatically blocked above P-11 (Pressurizer Pressure Interlock) Setpoint is automatically blocked below P-11 when Safety Injection on Steam Line Pressure-Low is not blocked.

and

ACTION STATEMENTS

ACTION 14 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 6 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, provided the other channel is OPERABLE.

ACTION 15 - Deleted

ACTION 16 - With the number of OPERABLE Channels one less than the Total Number of Channels, declare the affected Emergency Diesel Generator(s) inoperable and comply with the ACTION statements of Specification 3.8.1.1; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.

ACTION 17 - 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 met. One additional channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.

ACTION 18 - With less than the Minimum Channels OPERABLE requirement, operation may continue provided the containment purge supply and exhaust valves (RCV-11, 12, FCV 660, 661, 662, 663, 664) are maintained closed.

For Mode 3, the Trip Time Delay associated with the Steam Generator Water Level-Low-Low channel must be less than or equal to 464.1 seconds.

TABLE 3.3-3 (Continued)
ACTION STATEMENTS (Continued)

ACTION 19 - 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 be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ACTION 20 - 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 6 hours, and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel or one additional channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.

ACTION 21 - With less than the Minimum Number of Channels OPERABLE, within 1 hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

ACTION 22 - With the number of OPERABLE Channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 6 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 provided the other channel is OPERABLE.

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 at least HOT SHUTDOWN within the following 6 hours.

ACTION 24 - 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 declare the associated pump or valve inoperable and take the ACTION required by Specification 3.7.1.5 or 3.7.1.2 as applicable.

ACTION 25 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 6 hours or be in at least HOT STANDBY within the next 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1 provided the other channel is OPERABLE.

ACTION 29 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected protection set, the Trip Time Delay threshold power level for zero seconds time is adjusted to 0% RTP.

Insert B →

ACTION 35 - 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 trip condition within 6 hours, and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.2.1.

Insert B

ACTION 29 - With the number of OPERABLE channels less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected RCS Loop Delta-T channel(s), either:

a. The Trip Time Delay threshold power level for zero seconds time delay is adjusted to 0% RTP, or

b. With the number of OPERABLE channels one less than the Total Number of Channels, the affected Steam Generator Water Level-Low-Low channels are placed in the tripped condition.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
3. Containment Isolation (Continued)		
c. Containment Ventilation Isolation		
1) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
2) Plant Vent Noble Gas Activity-High (RM-14A and 14B)(a)	Per the ODCP	Deleted
3) Safety Injection	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.	
4) Containment Ventilation Exhaust Radiation-High (RM-44A and 44B)(b)	Per Specification 3.3.3.10	the ODCP
4. Steam Line Isolation		
a. Manual	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
c. Containment Pressure-High-High	≤ 22 psig	≤ 22.3 psig
d. Steam Line Pressure-Low	≥ 600 psig (Note 1)	≥ 594.6 psig (Note 1)

(a) The requirements for Plant Vent Noble Gas Activity-High (RM14A and 14B) are not applicable following installation of RM-44A and 44B.
(b) The requirements for Containment Ventilation Exhaust Radiation-High (RM-44A and 44B) are applicable following installation of RM-44A and 44B.

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Effective Cycle 7

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
e. Negative Steam Pressure Rate-High	≤ 100 psi (Note 3)	≤ 105.4 psi (Note 3)
5. Turbine Trip and Feedwater Isolation		
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
b. Steam Generator Water level-High-High	≤ 75% of narrow range instrument span each steam generator.	≤ 75.5% of narrow range instrument span each steam generator.
6. Auxiliary Feedwater		
a. Manual	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
c. Steam Generator Water Level-Low-Low	≥ 7.2% of narrow range instrument span each steam generator.	≥ 6.8% of narrow range instrument span each steam generator.
Coincident with:		
1) RCS Loop ΔT Equivalent to Power ≤ 50% RTP	RCS Loop ΔT variable input ≤ 50% RTP	RCS Loop ΔT variable input ≤ 51.5% RTP
With a time delay (TD)	TD (Note 2)	≤ (1.01)TD (Note 2)
Or		
2) RCS Loop ΔT Equivalent to Power >50% RTP	RCS Loop ΔT variable input >50% RTP	RCS Loop ΔT variable input >51.5% RTP
With no time delay	TD = 0	TD = 0
d. Undervoltage - RCP	≥ 8050 volts	≥ 7730 volts
e. Safety Injection	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.	

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April 1, 1994

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
7. Loss of Power (4.16 kV Emergency Bus Undervoltage)		
a. First Level		
1) Diesel Start	≥ 0 volts with a ≤ 0.8 second time delay and ≥ 2583 volts with a ≤ 10 second time delay	≥ 0 volts with a ≤ 0.8 second time delay and ≥ 2583 volts with ≤ 10 second time delay
2) Initiation of Load Shed	One relay ≥ 0 volts with a ≤ 4 second time delay and ≥ 2583 volts with a ≤ 25 second time delay with one relay ≥ 2870 volts, instantaneous	One relay ≥ 0 volts with a ≤ 4 second time delay and ≥ 2583 volts with a ≤ 25 second time delay with one relay ≥ 2870 volts, instantaneous
b. Second Level		
1) Diesel Start	≥ 3785 volts with a ≤ 10 second time delay	≥ 3785 volts with a ≤ 10 second time delay
2) Initiation of Load Shed	≥ 3785 volts with a ≤ 20 second time delay	≥ 3785 volts with a ≤ 20 second time delay
8. Engineered Safety Features Actuation System Interlocks		
a. Pressurizer Pressure, P-11	≤ 1915 psig	≤ 1920.6 psig
b. DELETED		
c. Reactor Trip, P-4	N.A.	N.A.

NOTE 1: Time constants utilized in the lead-lag controller for Steam Pressure - Low are τ_1 = 50 seconds and τ_2 = 5 seconds.

NOTE 2: Steam Generator Water Level Low-Low Trip Time Delay

$TD = B1(P)^3 + B2(P)^2 + B3(P) + B4$ [0.99]

Where: P = RCS loop ΔT Equivalent to Power (%RTP), P ≤ 50% RTP

TD = Time Delay for Steam Generator Water Level Low-Low Reactor Trip (in seconds)

Generators affected

B1 = -0.0072
B2 = +0.8181
B3 = -31.72
B4 = +468.8

B1 = -0.007128
B2 = +0.8099
B3 = -31.40
B4 = +464.1

Line

NOTE 3: Time constants utilized in the rate-lag controller for Negative Steam Pressure Rate-High are τ_3 = 50 seconds and τ_4 = 50 seconds.

Amendment Nos. 92 and 91
April 1, 1994

TABLE 3.3-5 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
7. Containment Pressure-High-High	
a. Containment Spray	≤ 48.5(6)
b. Phase "B" Isolation	N.A.
c. Steam Line Isolation	≤ 7
8. Steam Generator Water Level-High-High	
a. Turbine Trip	≤ 2.5
b. Feedwater Isolation	≤ 66
9. Steam Generator Water Level Low-Low	
a. Motor-Driven Auxiliary Feedwater Pumps	≤ 60(3)(8)
b. Turbine-Driven Auxiliary Feedwater Pump	≤ 60(8)
10. RCP Bus Undervoltage	
Turbine-Driven Auxiliary Feedwater Pump	≤ 60
11. Plant Vent Noble Gas Activity-High(a)	
Containment Ventilation Isolation	≤ 11
12. Containment Ventilation Exhaust Radiation-High (b)	
Containment Ventilation Isolation	≤ 11

Deleted

(a) The requirements for Plant Vent Noble Gas Activity-High are not applicable following installation of RM-44A and 44B.

(b) The requirements for Containment Ventilation Exhaust Radiation-High are applicable following installation of RM-44A and 44B.

Amendment Nos. ~~77~~ & ~~76~~ 84 and 83
Effective Cycle 7

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALI-BRATION	CHANNEL OPERA-TIONAL TEST	TRIP ACTUATING DEVICE OPERA-TIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
3. Containment Isolation								
a. Phase "A" Isolation								
1) Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q(4)	1, 2, 3, 4
3) Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
b. Phase "B" Isolation								
1) Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
3) Containment Pressure-High-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
c. Containment Ventilation Isolation								
1) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
2) Plant Vent Noble Gas Activity-High (RM-14A and 14B)(a)	S	R	M(2)	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
3) Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
4) Containment Ventilation Exhaust Radiation-High (RM-44A and 44B)(b)	S	R	M(2)	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4

Deleted

(a) The requirements for Plant Vent Noble Gas Activity-High (RM-14A and 14B) are not applicable following installation of RM-44A and 44B.
(b) The requirements for Containment Ventilation Exhaust Radiation-High (RM-44A and 44B) are applicable following installation of RM-44A and 44B.

Amendment Nos. 84 & 83 87 & 86 89 & 88
Effective Unit 1 Cycle 7

TABLE 4.3-2 (Continued)
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
4. Steam Line Isolation								
a. Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3
c. Containment Pressure-High-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
d. Steam Line Pressure-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
e. Negative Steam Line Pressure Rate-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	3(3)
5. Turbine Trip and Feedwater Isolation								
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2
b. Steam Generator Water Level-High-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2
6. Auxiliary Feedwater								
a. Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3
c. Steam Generator Water Level-Low-Low								
1) Steam Generator Water Level-Low-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3 (5)
2) RCS Loop ΔT	N.A.	R	Q	N.A	N.A	N.A	N.A	1, 2, 3

Amendment Nos. 61 and 60 84 and 83
Effective Cycle 7

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
6. Auxiliary Feedwater (Continued)								
d. Undervoltage - RCP	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1
e. Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
7. Loss of Power								
a. 4.16 kV Emergency Bus Level 1	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. 4.16 kV Emergency Bus Level 2	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
8. Engineered Safety Feature Actuation System Interlocks								
a. Pressurizer Pressure, P-11	N.A.	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
b. DELETED								
c. Reactor Trip, P-4	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3

TABLE NOTATIONS

(1) Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.
(2) For the Containment Ventilation Exhaust Radiation-High monitor only, a CHANNEL FUNCTIONAL TEST shall be performed at least once every 31 days.
(3) Trip function automatically blocked above P-11 (Pressurizer Pressure Interlock) setpoint and is automatically blocked below P-11 when Safety Injection on Steam Line Pressure-Low is not blocked.
(4) For Units 1 and 2, Cycle 7 and after: Except relays K612A, K614B, K615A, and K615B, which shall be tested, at a minimum, once per 18 months during refueling and during each Cold Shutdown unless they have been tested within the previous 92 days.
(5) For Mode 3, the Trip Time Delay associated with the Steam Generator Water Level-Low-Low channel must be less than or equal to 464.1 seconds.

Amendment Nos. 61 and 60 84 & 83 87 and 86
Effective Cycle 7

TABLE 3.3-6

RADIATION MONITORING INSTRUMENTATION FOR PLANT OPERATIONS

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	ACTION
1. Fuel Handling Building				
a. Storage Area				
1) Spent Fuel Pool	1	*	≤ 75 mR/hr	30 & 32**(a)
2) New Fuel Storage	1	*	≤ 15 mR/hr	30 & 32**(a)
b. Gaseous Activity				
Fuel Handling Building Ventilation Mode Change(d)	1	*	Per the ODCP	32**
2. Control Room				
Ventilation Mode Change	2***	All	≤ 2 mR/hr	34
3. Containment				
a. Gaseous Activity				
1) Containment Ventilation Isolation (RM-14A or 14B)(b)	1	6	Per the ODCP	33
2) RCS Leakage	1	1, 2, 3, 4	N.A.	31
3) Containment Ventilation Isolation (RM-44A or 44B)(c)	1	6	Per the ODCP	33
b. Particulate Activity				
1) Containment Ventilation Isolation (RM-44A or 44B)(c)	1	6	Per the ODCP	33
2) RCS Leakage	1	1, 2, 3, 4	N.A.	31

*With fuel in the spent fuel pool or new fuel storage vault.
**With irradiated fuel in the spent fuel pool.
***One channel for each normal intake to the Control Room Ventilation System (common to both units).
(a) Action 32 is not applicable to the Fuel Storage Area Monitors following installation of RM-45A and 45B.
(b) The requirements for Containment Ventilation Isolation (RM-14A or 14B) are not applicable following installation of RM-44A and 44B.
(c) The requirements for Containment Ventilation Isolation (RM-44A or 44B) are applicable following installation of RM-44A and 44B.
(d) The requirements for Fuel Handling Building Ventilation Mode Change are applicable following installation of RM-45A and 45B.

Amendment Nos. 70 and 69
April 20, 1992

TABLE 3.3-3

RADIATION MONITORING INSTRUMENTATION FOR PLANT OPERATIONS SURVEILLANCE REQUIREMENTS

	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Fuel Handling Building				
a. Storage Area				
1) Spent Fuel Pool	S	R	M	*
2) New Fuel Storage	S	R	M	*
b. Gaseous Activity				
Fuel Handling Building Ventilation Mode Change(c)	S	R	M	*
2. Control Room Ventilation Mode Change	S	R	M	All
3. Containment				
a. Gaseous Activity				
1) Containment Ventilation Isolation (RM-14A or 14B)(a)	S	R	M	6
2) RCS Leakage	S	R	M	1, 2, 3, 4
3) Containment Ventilation Isolation (RM-44A or 44B)(b)	S	R	M	6
b. Particulate Activity				
1) Containment Ventilation Isolation (RM-44A or 44B)(b)	S	R	M	6
2) RCS Leakage	S	R	M	1, 2, 3, 4

*With fuel in the spent fuel pool or new fuel storage vault.

(a) The requirements for Containment Ventilation Isolation (RM-14A or 14B) are not applicable following installation of RM-44A and 44B.

(b) The requirements for Containment Ventilation Isolation (RM-44A or 44B) are applicable following installation of RM-44A and 44B.

(c) The requirements for Fuel Handling Building Ventilation Mode Change are applicable following installation of RM-45A and 45B.

Amendment Nos. 70 & 69
April 20, 1992

INSTRUMENTATION

ACCIDENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.6 The accident monitoring instrumentation channels shown in Table 3.3-10 shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With the number of OPERABLE accident monitoring instrumentation channels except for Reactor Vessel Level Indication System provided under e. less than the Required Number of Channels shown in Table 3.3-10, restore the inoperable channel(s) to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours.

b. With the number of OPERABLE accident monitoring instrumentation channels except the containment recirculation sump level-narrow range, the main steam line radiation monitor, the containment area radiation monitor-high range, and the plant vent radiation monitor-high range, ~~and the~~ Reactor Vessel Level Indication System as provided under e. less than the Minimum Channels OPERABLE requirements of Table 3.3-10, restore the inoperable channel(s) to OPERABLE status within 48 hours or be in at least HOT SHUTDOWN within the next 12 hours.

c. With the number of OPERABLE channels for the containment recirculation sump level-narrow range less than the Minimum Channels OPERABLE requirement of Table 3.3-10, restore the inoperable channel to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours.

d. With the number of OPERABLE channels for the main steam line radiation monitor, or the containment area radiation monitor-high range or the plant vent radiation monitor-high range less than the Minimum Channels OPERABLE requirements of Table 3.3-10, initiate the preplanned alternate method of monitoring the appropriate parameter(s) within 72 hours and either restore the inoperable channel(s) to OPERABLE status within 7 days or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 14 days that provides actions taken, cause of the inoperability and plans and schedule for restoring the channels to OPERABLE status.

e. With the number of OPERABLE channels for the Reactor Vessel Level Indication System less than the Required Number of Channels or the Minimum Channels OPERABLE requirement of Table 3.3-10 as applicable, restore the inoperable channel(s) to OPERABLE status as specified in respective Action Statement a. or b. if repair is feasible during plant operation. If repair is not feasible, prepare and submit a Special Report to the Commission, pursuant to Specification 6.9.2 within 14 days that provides actions taken, cause of the inoperability

LIMITING CONDITION FOR OPERATION (Continued)

and plans and schedule for restoring the channel(s) to OPERABLE status. The inoperable channel(s) shall be restored to OPERABLE during the first refueling outage.

f. Action Statement e. applies to first fuel cycle only and statement a. and b. shall become effective thereafter.

e → g. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.6 Each accident monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION at the frequencies shown in Table 4.3-7.

4.4.4.1 In addition to the requirements of Specification 4.0.5, each PORV shall be demonstrated OPERABLE at least once per 18 months by:

a. For Unit 1, Cycle 6:

Operating the PORV through one complete cycle of full travel, and

For Unit 1, Cycle 7 and after, and Unit 2, Cycle 6 and after:

Operating the PORV through one complete cycle of full travel during MODES 3 or 4 with the block valves closed, and

b. Performing a CHANNEL CALIBRATION of the actuation instrumentation.

4.4.4.2 In addition to the requirements of Specification 4.0.5, each block valve shall be demonstrated OPERABLE at least once per 92 days by operating the valve through one complete cycle of full travel unless the block valve is closed in order to meet the requirements of ACTION b. or c. in Specification 3.4.4.

4.4.4.3 The safety-related nitrogen supply for the PORVs shall be demonstrated OPERABLE at least once per 18 months by:

a. Isolating and venting the normal air supply, and

b. Verifying that any leakage of the Class 1 Backup Nitrogen System is within its limits, and

c. Operating the PORVs through one complete cycle of full travel.

4.4.9.3.1 Each Class 1 PORV shall be demonstrated OPERABLE by:

a. Performance of an ANALOG CHANNEL OPERATIONAL TEST on the PORV actuation channel, but excluding valve operation, at least once per 31 days;

b. Performance of a CHANNEL CALIBRATION on the PORV actuation channel at least once per 18 months; and

c. Verifying the PORV isolation valve is open at least once per 72 hours when the PORV is being used for overpressure protection.

4.4.9.3.2 The RCS vent shall be verified to be open when the vent is being used for overpressure protection at least once per 31 days when the pathway is provided by a valve(s) that is locked, sealed, or otherwise secured in the open position; otherwise verify the vent pathway every 12 hours.

SURVEILLANCE REQUIREMENTS (Continued)

g. By verifying the correct position of each electrical and/or mechanical position stop for the following ECCS throttle valves:

1) Within 4 hours following completion of each valve stroking operation or maintenance on the valve when the ECCS subsystems are required to be OPERABLE, and

2) At least once per 18 months.

Charging Injection Throttle Valves	Safety Injection Throttle Valves
8810A	8822A
8810B	8822B
8810C	8822C
8810D	8822D

h. By performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying that:

For Unit 1 Cycle 5

1) For centrifugal charging pump lines, with a single pump running:

a) The sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to 346 gpm, and

b) The total pump flow rate is less than or equal to 550 gpm.

2) For safety injection pump lines, with a single pump running:

a) The sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to 463 gpm, and

b) The total pump flow rate is less than or equal to 650 gpm.

For Unit 1 Cycle 6 and after, and Unit 2 Cycle 5 and after:

1) For centrifugal charging pumps, with a single pump running:

a) The sum of injection line flow rates, excluding the highest flow rate, is greater than or equal to 299 gpm, and

Amendment Nos. 72 & 71
August 6, 1992

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two independent circuits (one with delayed access) between the offsite transmission network and the Onsite Class 1E Distribution System, and

b. Three separate and independent diesel generators, each with:

1. For Unit 1 Cycle 6 and Unit 2 Cycle 6:

A separate engine-mounted fuel tank containing a minimum volume of 200 gallons of fuel, and

For Unit 1 Cycle 7 and after, Unit 2 Cycle 7 and after:

A separate engine-mounted fuel tank containing a minimum volume of 250 gallons of fuel, and

2. Two supply trains of the Diesel Fuel Oil Storage and Transfer System containing a minimum combined storage of 33,000 gallons of fuel for one unit operation* and 65,000 gallons of fuel for two unit operation.

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

ACTION:

a. With one offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Specification 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter. If each of the diesel generators have not been successfully tested within the past 24 hours demonstrate its OPERABILITY by performing Specification 4.8.1.1.2a.2) separately for each such diesel generator within 24 hours. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With a diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the A.C. offsite sources by performing Specification 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; and if the diesel generator became inoperable due to any cause other than preventive maintenance or

*The performance of Technical Specification Surveillance Requirement 4.8.1.1.3.e requires one fuel oil storage tank to be removed from service to be drained and cleaned. During this surveillance, the diesel generator fuel oil storage requirement for one unit operation in Modes 1 through 4 and one unit operation in Mode 6 with at least 23 feet of water above the reactor vessel flange or with the reactor vessel defueled is 35,000 gallons. The tank being cleaned may be inoperable for up to 10 days. For the duration of tank cleaning, temporary onsite fuel oil storage of 24,000 gallons will be maintained. Prior to removal of a tank from service, the offsite circuits required by Technical Specification 3.8.1.1.a will be verified to be OPERABLE.

Amendment Nos. ~~44 & 43~~, ~~74 & 73~~, 93 & 92

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.1.2 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. One circuit between the offsite transmission network and the Onsite Class 1E Distribution System, and

b. One diesel generator with:

1. For Unit 1 Cycle 6 and Unit 2 Cycle 6:

An separate engine-mounted fuel tank containing a minimum volume of 200 gallons of fuel,

For Unit 1 Cycle 7 and after, Unit 2 Cycle 7 and after:

An separate engine-mounted fuel tank containing a minimum volume of 250 gallons of fuel,

2. One supply train of the Diesel Fuel Oil Storage and Transfer system containing a minimum storage of 26,000 gallons* of fuel in addition to the fuel required for the other unit.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel or crane operations with loads over the fuel storage pool. In addition, when in MODE 5 with the reactor coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the requirements of Specifications 4.8.1.1.1, 4.8.1.1.2, 4.8.1.1.3, and 4.8.1.1.4, except for Specifications 4.8.1.1.1.b.2) and 4.8.1.1.2.a.2)c), b.2) for ESF timers, b.6), b.7), b.10), and b.11).

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*The performance of Technical Specification Surveillance Requirement 4.8.1.1.3.e requires one fuel oil storage tank to be removed from service to be drained and cleaned. During this surveillance, the diesel generator fuel oil storage requirement for one unit operation in Modes 5 or 6 and one unit operation in Mode 6 with at least 23 feet of water above the reactor vessel flange or with the reactor vessel defueled is 35,000 gallons. The tank being cleaned may be inoperable for up to 10 days. For the duration of tank cleaning, temporary onsite fuel oil storage of 24,000 gallons will be maintained. Prior to removal of a tank from service, the offsite circuits required by Technical Specification 3.8.1.2.a will be verified to be OPERABLE.

ELECTRICAL POWER SYSTEMS

3/4.8.2 ONSITE POWER DISTRIBUTION

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 The following electrical busses shall be energized in the specified manner:

For Units 1 and 2, Cycle 6:

a. 4160 volt Vital Bus F.
b. 480 volt Vital Bus F.
c. 4160 volt Vital Bus G.
d. 480 volt Vital Bus G.
e. 4160 volt Vital Bus H.
f. 480 volt Vital Bus H.
g. 120 volt Vital Instrument A.C. Bus 1 energized from its associated inverter connected to D.C. Bus 1*.
h. 120 volt Supplemental Vital Instrument A.C. Bus 1A energized from its associated inverter connected to D.C. Bus 1*.
i. 120 volt Vital Instrument A.C. Bus 2 energized from its associated inverter connected to D.C. Bus 2*.
j. 120 volt Vital Instrument A.C. Bus 3 energized from its associated inverter connected to D.C. Bus 3*.
k. 120 volt Supplemental Vital Instrument A.C. Bus 3A energized from its associated inverter connected to D.C. Bus 3*.
l. 120 volt Vital Instrument A.C. Bus 4 energized from its associated inverter connected to D.C. Bus 2*.
m. 125 volt D.C. Bus 1 energized from Battery Bank 1, and its associated full-capacity charger.
n. 125 volt D.C. Bus 2 energized from Battery Bank 2, and its associated full-capacity charger, and
o. 125 volt D.C. Bus 3 energized from Battery Bank 3, and its associated full-capacity charger.

*Two vital instrument A.C. inverters or one vital and one supplemental vital instrument A.C. inverter may be disconnected from their D.C. busses for up to 24 hours for the purpose of performing an equalizing charge on their associated battery bank provided: (1) their vital busses are energized, and (2) the vital busses associated with the other battery banks are energized from their associated inverters and connected to their associated D.C. busses.

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September 17, 1993

LIMITING CONDITION FOR OPERATION (Continued)

For Units 1 and 2, Cycle 7 and after:

a. 4160 volt Vital Bus F.
b. 480 volt Vital Bus F.
c. 4160 volt Vital Bus G.
d. 480 volt Vital Bus G.
e. 4160 volt Vital Bus H.
f. 480 volt Vital Bus H.
g. 120 volt Vital Instrument A.C. Bus 1 energized from its associated inverter connected to D.C. Bus 1.
h. 120 volt Vital Instrument A.C. Bus 2 energized from its associated inverter connected to D.C. Bus 2.
i. 120 volt Vital Instrument A.C. Bus 3 energized from its associated inverter connected to D.C. Bus 3.
j. 120 volt Vital Instrument A.C. Bus 4 energized from its associated inverter connected to D.C. Bus 2.
k. 125 volt D.C. Bus 1 energized from Battery Bank 1, and its associated full-capacity charger.
l. 125 volt D.C. Bus 2 energized from Battery Bank 2, and its associated full-capacity charger, and
m. 125 volt D.C. Bus 3 energized from Battery Bank 3, and its associated full-capacity charger.

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

ACTION:

For Units 1 and 2, Cycle 6:

a. With one of the required 4160 volt and/or associated 480 volt vital busses not energized, re-energize them within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one vital instrument A.C. bus not energized from its associated inverter, or with one inverter not connected to its associated D.C. bus, re-energize the vital instrument A.C. bus from an alternate source within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; re-energize the vital instrument A.C. bus from its associated inverter connected to its associated D.C. bus within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With more than one full-capacity charger receiving power simultaneously from a single 480 volt vital bus or any D.C. bus not receiving power from its associated A.C. division, restore the system to a configuration wherein each charger is powered from its associated 480 volt vital bus within 14 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

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September 17, 1993

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued) For Units 1 and 2, Cycle 6

d. With one D.C. bus not energized from its associated battery bank and a full capacity charger, re-energize it from its associated battery bank and a full capacity charger within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

e. With one supplemental vital instrument A.C. bus not energized from its associated inverter or with its inverter not connected to its associated D.C. bus, re-energize the supplemental vital instrument A.C. bus from an alternate source within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; re-energize the supplemental vital instrument A.C. bus from its associated inverter connected to its associated D.C. bus within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

For Units 1 and 2, Cycle 7 and after:

a. With one of the required 4160 volt and/or associated 480 volt vital busses not energized, re-energize them within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one vital instrument A.C. bus not energized from its associated inverter, or with one inverter not connected to its associated D.C. bus, re-energize the vital instrument A.C. bus from an alternate source within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; re-energize the vital instrument A.C. bus from its associated inverter connected to its associated D.C. bus within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With more than one full capacity charger receiving power simultaneously from a single 480 volt vital bus or any D.C. bus not receiving power from its associated A.C. division, restore the system to a configuration wherein each charger is powered from its associated 480 volt vital bus within 14 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

d. With one D.C. bus not energized from its associated battery bank and a full-capacity charger, re-energize it from its associated battery bank and a full-capacity charger within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.8.2.1 The specified busses shall be determined energized in the required manner at least once per 7 days by verifying correct breaker alignment and indicated voltage on the busses.

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September 17, 1993

LIMITING CONDITION FOR OPERATION

3.8.2.2 As a minimum, the following electrical busses shall be energized in the specified manner:

For Units 1 and 2, Cycle 6:

a. One 4160-volt and its associated 480-volt A.C. vital bus,

b. Two 120-volt vital instrument A.C. busses and one 120-volt supplemental vital instrument A.C. bus energized from their associated inverters connected to their respective D.C. busses, and

c. One 125-volt D.C. bus energized from its associated battery bank and full-capacity charger supplied from its associated OPERABLE A.C. vital bus.

For Units 1 and 2, Cycle 7 after:

a. One 4160 volt and its associated 480 volt A.C. vital bus,

b. Two 120 volt vital instrument A.C. busses energized from their associated inverters connected to their respective D.C. busses, and

c. One 125 volt D.C. bus energized from its associated battery bank and full-capacity charger supplied from its associated OPERABLE A.C. vital bus.

APPLICABILITY: MODES 5 and 6.

ACTION:

With any of the above required electrical busses not energized in the required manner, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, or movement of irradiated fuel, initiate corrective action to energize the required electrical busses in the specified manner as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.2.2 The specified busses shall be determined energized in the required manner at least once per 7 days by verifying correct breaker alignment and indicated voltage on the busses.

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September 17, 1993

3/4.9.2 INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.9.2 As a minimum, two Source Range Neutron Flux Monitors shall be OPERABLE each with continuous visual indication in the control room and one with audible indication in containment and the control room.

APPLICABILITY: MODE 6.

ACTION:

a. With one of the above required monitors inoperable or not operating, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes except for latching the control rod drive mechanism shaft to the rod cluster control assemblies and friction testing of individual control rods.

b. With both of the above required monitors inoperable or not operating, determine the boron concentration of the Reactor Coolant System at least once per 12 hours.

SURVEILLANCE REQUIREMENTS

4.9.2 Each Source Range Neutron Flux Monitor shall be demonstrated OPERABLE by performance of:

a. A CHANNEL CHECK at least once per 12 hours,

b. An ANALOG CHANNEL OPERATIONAL TEST within 8 hours prior to the initial start of CORE ALTERATIONS, and

c. An ANALOG CHANNEL OPERATIONAL TEST at least once per 7 days.

3/4.9.9 CONTAINMENT VENTILATION ISOLATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.9.9 The Containment Ventilation Isolation System shall be OPERABLE.

APPLICABILITY: During CORE ALTERATIONS or movement of irradiated fuel within containment.

ACTION:

a. With the Containment Ventilation Isolation System inoperable, close each of the ventilation penetrations providing direct access from the containment atmosphere to the outside atmosphere.

b. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.9 The Containment Ventilation Isolation System shall be demonstrated OPERABLE within 100 hours prior to the start of and at least once per 7 days during CORE ALTERATIONS by verifying that containment ventilation isolation occurs on a High Radiation test signal from the plant vent noble gas activity monitoring instrumentation channels.(a)

containment ventilation exhaust radiation

(a) Following installation of RM-44A and 44B, the high radiation test signal shall come from the containment ventilation exhaust radiation monitoring instrumentation channels.

SPECIAL TEST EXCEPTIONS

3/4.10.3 PHYSICS TESTS

LIMITING CONDITION FOR OPERATION

3.10.3 The limitations of Specifications 3.1.1.3, 3.1.1.4, 3.1.3.1, 3.1.3.5, and 3.1.3.6 may be suspended during the performance of PHYSICS TESTS provided:

a. The THERMAL POWER does not exceed 5% of RATED THERMAL POWER,

b. The Reactor Trip Setpoints on the OPERABLE Intermediate and Power Range channels are set at less than or equal to 25% of RATED THERMAL POWER, and

c. The Reactor Coolant System lowest operating loop temperature (T_{avg}) is greater than or equal to 531°F.

APPLICABILITY: MODE 2.

ACTION:

a. With the THERMAL POWER greater than 5% of RATED THERMAL POWER, immediately open the Reactor trip breakers.

b. With a Reactor Coolant System operating loop temperature (T_{avg}) less than 531°F, restore T_{avg} to within its limit within 15 minutes or be in at least HOT STANDBY within the next 15 minutes.

SURVEILLANCE REQUIREMENTS

4.10.3.1 The THERMAL POWER shall be determined to be less than or equal to 5% of RATED THERMAL POWER at least once per hour during PHYSICS TESTS.

4.10.3.2 Each Intermediate and Power Range channel shall be subjected to an ANALOG CHANNEL OPERATIONAL TEST within 12 hours prior to initiating PHYSICS TESTS.

4.10.3.3 The Reactor Coolant System temperature (T_{avg}) shall be determined to be greater than or equal to 531°F at least once per 30 minutes during PHYSICS TESTS.

ECCS SUBSYSTEMS (Continued)

The requirement to maintain the RHR Suction Valves 8701 and 8702 in the locked closed condition in MODES 1, 2 and 3 provides assurance that a fire could not cause inadvertent opening of these valves when the RCS is pressurized to near operating pressure. These valves are not part of an ECCS subsystem.

The limitation for a maximum of one centrifugal charging pump to be OPERABLE and the Surveillance Requirement to verify all centrifugal charging pumps and Safety Injection pumps except the required OPERABLE charging pump to be inoperable below 323°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

For Unit 1 Cycle 5 and Unit 2 Cycle 4:

The Surveillance Requirements provided to ensure OPERABILITY of each component ensures that, at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained. Surveillance requirements for throttle valve position stops and flow balance testing provide assurance that proper ECCS flows will be maintained in the event of a LOCA. Maintenance of proper flow resistance and pressure drop in the piping system to each injection point is necessary to: -(1) prevent total pump flow from exceeding runout conditions when the system is in its minimum resistance configuration, (2) provide the proper flow split between injection points in accordance with the assumptions used in the ECCS-LOCA analyses, and (3) provide an acceptable level of total ECCS flow to all injection points equal to or above that assumed in the ECCS-LOCA analyses.

For Unit 1 Cycle 6 and after, and Unit 2 Cycle 5 and after:

The Surveillance Requirements provided to ensure OPERABILITY of each component ensure that, at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained. The safety analyses make assumptions with respect to minimum total system resistance, minimum and maximum total injection line resistance, and minimum individual injection line resistance. These resistances in conjunction with the ranges of potential pump performance are used to calculate the minimum and maximum ECCS flows assumed in the safety analyses.

The minimum flow Surveillance Requirement ensures that the maximum injection line resistance assumptions are met. These assumptions are used to calculate minimum flows to the RCS for safety analyses which are limited by minimum ECCS flow to the RCS.

ATTACHMENT C

PROPOSED TECHNICAL SPECIFICATION PAGES

BASES

2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS

2.2.1 The Reactor Trip System Instrumentation and Interlock Setpoints shall be set consistent with the Trip Setpoint values shown in Table 2.2-1.

APPLICABILITY: As shown for each channel in Table 3.3-1.

ACTION:

a. With a Reactor Trip System Instrumentation or Interlock Setpoint less conservative than the value shown in the Trip Setpoint column but more conservative than the value shown in the Allowable Values column of Table 2.2-1, adjust the Setpoint consistent with the Trip Setpoint value.

b. With a Reactor Trip System Instrumentation or Interlock Setpoint less conservative than the value shown in the Allowable Values column of Table 2.2-1, declare the channel inoperable and apply the applicable ACTION statement requirements of Specification 3.3.1 until the channel is restored to OPERABLE status with its Setpoint adjusted consistent with the Trip Setpoint value.

TABLE 2. (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
13. Steam Generator Water Level-Low-Low	≥ 7.2% of narrow range instrument span-each steam generator	≥ 6.8% of narrow range instrument span-each steam generator
Coincident with:		
a. RCS Loop ΔT Equivalent to Power ≤ 50% RTP	RCS Loop ΔT variable input ≤ 50% RTP	RCS Loop ΔT variable input ≤ 51.5% RTP
With a time delay (TD)	≤ TD (Note 5)	≤ (1.01)TD (Note 5)
Or		
b. RCS Loop ΔT Equivalent to Power > 50% RTP	RCS Loop ΔT variable input > 50% RTP	RCS Loop ΔT variable input > 51.5% RTP
With no time delay	TD = 0	TD = 0
14. DELETED		
15. Undervoltage-Reactor Coolant Pumps	≥ 8050 volts-each bus	≥ 7730 volts-each bus
16. Underfrequency-Reactor Coolant Pumps	≥ 54.0 Hz - each bus	≥ 53.9 Hz - each bus
17. Turbine Trip		
a. Low Autostop Oil Pressure	≥ 50 psig	≥ 45 psig
b. Turbine Stop Valve Closure	≥ 1% open	≥ 1% open
18. Safety Injection Input from ESF	N.A.	N.A.
19. Reactor Coolant Pump Breaker Position Trip	N.A.	N.A.
20. Reactor Trip Breakers	N.A.	N.A.
21. Automatic Trip and Interlock Logic	N.A.	N.A.

TABLE 2. (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

TABLE NOTATIONS

NOTE 3: OVERPOWER ΔT

$$\Delta T\left(\frac{1+\tau_4 S}{1+\tau_5 S}\right) \leq \Delta T_o\{K_4 - K_5 \left(\frac{\tau_3 S}{1+\tau_3 S}\right) T - K_6 [T-T"] - f_2(\Delta I)\}$$

Where: $\frac{1+\tau_4 S}{1+\tau_5 S}$ = Lead-lag compensator on measured ΔT

τ_4, τ_5 = Time constants utilized in the lead-lag controller for ΔT, τ_4 = 0 seconds, τ_5 = 0 seconds

ΔT_o = Indicated ΔT at RATED THERMAL POWER

K_4 = 1.072

K_5 = 0.0174/°F for increasing average temperature, and 0 for decreasing average temperature

$\frac{\tau_3 S}{1+\tau_3 S}$ = The function generated by the rate-lag controller for T_{avg} dynamic compensation

τ_3 = Time constants utilized in the rate-lag controller for T_{avg}, τ_3 = 10 secs.

K_6 = 0.00145/°F for $T > T"$, and 0 for $T \leq T"$

T = Average temperature, °F

T" = Indicated T_{avg} at RATED THERMAL POWER

S = Laplace transform operator, s^{-1}

$f_2(\Delta I)$ = 0 for all ΔI

TABLE 2.[illegible] (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

TABLE NOTATIONS

NOTE 4: The channel's maximum Trip Setpoint shall not exceed its computed Trip Setpoint by more than 1.0% ΔT span

NOTE 5: Steam Generator Water Level Low-Low Trip Time Delay

$$TD = B1(P)^3 + B2(P)^2 + B3(P) + B4$$

Where: P = RCS Loop ΔT Equivalent to Power (%RTP), $P \leq 50\%$ RTP

TD = Time delay for Steam Generator Water Level Low-Low Reactor Trip (in seconds).

B1 = -0.007128

B2 = +0.8099

B3 = -31.40

B4 = +464.1

Reactor Coolant Flow

The Low Reactor Coolant Flow trips provide core protection to prevent DNB by mitigating the consequences of a loss of flow resulting from the loss of one or more reactor coolant pumps.

On increasing power above P-7 (a power level of approximately 10% of RATED THERMAL POWER or a turbine impulse chamber pressure at approximately 10% of full power equivalent), an automatic Reactor trip will occur if the flow in more than one loop drops below 90% of nominal full loop flow. Above P-8 (a power level of approximately 35% of RATED THERMAL POWER) an automatic Reactor trip will occur if the flow in any single loop drops below 90% of nominal full loop flow. Conversely on decreasing power between P-8 and P-7 an automatic reactor trip will occur on loss of flow in more than one loop and below P-7 the trip function is automatically blocked.

Overtemperature ΔT

The Overtemperature ΔT trip provides core protection to prevent DNB for all combinations of pressure, power, coolant temperature, and axial power distribution, provided that (1) the transient is slow with respect to delays associated with fluid transport from the core to the loop temperature detectors (RTDs), and thermowell and RTD response time delays, and (2) pressure is within the range between the Pressurizer High and Low Pressure trips. The Setpoint is automatically varied with: (1) coolant temperature to correct for temperature induced changes in density and heat capacity of water and includes dynamic compensation for transport and thermowell delays from the core to the loop temperature detectors, (2) pressurizer pressure, and (3) axial power distribution. With normal axial power distribution, this Reactor trip limit is always below the core Safety Limit as shown in Figure 2.1-1. If axial peaks are greater than design, as indicated by the difference between top and bottom power range nuclear detectors, the Reactor trip is automatically reduced according to the notations in Table 2.2-1.

Delta-T_o, as used in the Overtemperature and Overpower ΔT trips, represents the 100% RTP value as measured by the plant for each loop. This normalizes each loop's ΔT trips to the actual operating conditions existing at the time of measurement, thus forcing the trip to reflect the equivalent full power conditions as assumed in the accident analyses. These differences in RCS loop ΔT can be due to several factors, e.g., measured RCS loop flow greater than minimum measured flow, and slightly asymmetric power distributions between quadrants. While RCS loop flows are not expected to change with cycle life, radial power redistribution between quadrants may occur, resulting in small changes in loop specific ΔT value. Accurate determination of the loop specific ΔT value should be made when performing Incore/Excore quarterly recalibration and under steady state conditions (i.e., power distributions not affected by xenon or other transient conditions).

Steam Generator Water Level

The Steam Generator Water Level Low-Low trip protects the reactor from loss of heat sink in the event of a sustained steam/feedwater flow mismatch resulting from loss of normal feedwater or a feedwater system pipe break, inside or outside containment. This function also provides input to the steam generator level control system. IEEE 279 requirements are satisfied by 2/3 logic for protection function actuation, thus allowing for a single failure of a channel and still performing the protection function. Control/protection interaction is addressed by the use of the Median Signal Selector which prevents a single failure of a channel providing input to the control system requiring protection function action. That is, a single failure of a channel providing input to the control system does not result in the control system initiating a condition requiring protection function action. The Median Signal Selector performs this by not selecting the channels indicating the highest or lowest steam generator levels as input to the control system.

The Trip Time Delay (TTD) creates additional operational margin when the plant needs it most, during early escalation to power, by allowing the operator time to recover level when the primary side load is sufficiently small to allow such action. The TTD is based on continuous monitoring of primary side power through the use of RCS loop ΔT. The magnitude of the delays decreases with increasing primary side power level, up to 50% RTP. Above 50% RTP there are no time delays for the Low-Low Level trips.

In the event of failure of a Steam Generator Water Level channel, the channel is placed in the trip condition as input to the Solid State Protection System. Failure of the RCS loop ΔT input affects the TTD calculation for a protection set. This results in the requirement that either the operator adjust the threshold power level for zero seconds time delay from 50% RTP to 0% RTP, through the Man Machine Interface, or the affected Steam Generator Water Level channels be placed in the tripped condition.

Undervoltage and Underfrequency - Reactor Coolant Pump Busses

The Undervoltage and Underfrequency Reactor Coolant Pump Bus trips provide core protection against DNB as a result of complete loss of forced coolant flow. The specified Setpoints assure a Reactor trip signal is generated before the Low Flow Trip Setpoint is reached. Time delays are incorporated in the Underfrequency and Undervoltage trips to prevent spurious Reactor trips from momentary electrical power transients. For undervoltage, the delay is set so that the time required for a signal to reach the Reactor trip breakers following the simultaneous trip of two or more reactor coolant pump bus circuit breakers shall not exceed 0.9 seconds. For underfrequency, the delay is set so that the time required for a signal to reach the Reactor trip breakers after the Underfrequency Trip Setpoint is reached shall not exceed 0.3 seconds. On decreasing power, the Undervoltage and Underfrequency Reactor Coolant Pump Bus trips are automatically blocked by P-7 (a power level of approximately 10% of RATED THERMAL POWER with a turbine impulse chamber pressure at approximately 10% of full power equivalent); and on increasing power, reinstated automatically by P-7.

Turbine Trip

A Turbine trip initiates a Reactor trip. On decreasing power, the Turbine trip is automatically blocked by P-9 (a power level of approximately 50% of RATED THERMAL POWER); and on increasing power, reinstated automatically by P-9.

Safety Injection Input from ESF

If a Reactor trip has not already been generated by the Reactor Trip System instrumentation, the ESF automatic actuation logic channels will initiate a Reactor trip upon any signal which initiates a Safety Injection. The ESF instrumentation channels which initiate a Safety Injection signal are shown in Table 3.3-3.

Reactor Coolant Pump Breaker Position Trip

The Reactor Coolant Pump Breaker Position trip is an anticipatory trip which provides core protection against DNB. The Open/Close Position trip assures a reactor trip signal is generated before the Low Flow Trip Setpoint is reached. No credit was taken in the safety analyses for operation of this trip. The functional capability at the open/close position settings is required to enhance the overall reliability of the Reactor Trip System. Above P-7 (a power level of approximately 10% of RATED THERMAL POWER or a turbine impulse chamber pressure at approximately 10% of full power equivalent) an automatic reactor trip will occur if more than one reactor coolant pump breaker is opened. Below P-7 the trip function is automatically blocked.

Reactor Trip System Interlocks

The Reactor Trip System Interlocks perform the following functions:

P-6 On increasing power, P-6 allows the manual block of the Source Range trip and de-energizing of the high voltage to the detectors. On decreasing power, Source Range Level trips are automatically reactivated and high voltage restored.

P-7 On increasing power, P-7 automatically enables Reactor trips on low flow in more than one reactor coolant loop, more than one reactor coolant pump breaker open, reactor coolant pump bus undervoltage and underfrequency, pressurizer low pressure and pressurizer high level. On decreasing power, the above listed trips are automatically blocked.

TABLE 3.3 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
12. Reactor Coolant Flow-Low					
a. Single Loop (Above P-8)	3/loop	2/loop in one loop	2/loop in each loop	1	6
b. Two Loops (Above P-7 and below P-8)	3/loop	2/loop in two loops	2/loop in each loop	1	6
13. Steam Generator Water Level Low-Low					
a. Steam Generator Water Level-Low-Low	3/S.G.	2/S.G. in one S.G.	2/S.G. in each S.G.	1,2	6
b. RCS Loop ΔT	4 (1/loop)	N.A.	N.A.	1,2	27
14. DELETED					
15. Undervoltage-Reactor Coolant Pumps	2/bus	1/bus both busses	1/bus	1	28
16. Underfrequency-Reactor Coolant Pumps	3/bus	2 on same bus	2/bus	1	28
17. Turbine Trip					
a. Low Autostop Oil Pressure	3	2	2	1	7
b. Turbine Stop Valve Closure	4	4	4	1	7

TABLE 3.3-1 (Continued)
ACTION STATEMENTS (Continued)

ACTION 9 - With less than the Minimum Number of Channels OPERABLE, operation may continue provided the inoperable channel is placed in the tripped condition within the next 6 hours.

ACTION 10 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1, provided the other channel is OPERABLE.

ACTION 11 - 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 12 - 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 apply ACTION 10. 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.

ACTION 13 - 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 Minimum Channels OPERABLE requirement is met, and

b. The inoperable channel is placed in the tripped conditions within 6 hours; however, the inoperable channel may be bypassed for up to 72 hours for surveillance testing per Specification 4.3.1.1 or for performing maintenance.

ACTION 26 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable Channel to OPERABLE status within 6 hours or be in at least 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, provided the other channel is OPERABLE.

ACTION 27 - With the number of OPERABLE channels less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected RCS Loop Delta-T channel(s), either:

a. The Trip Time Delay threshold power level for zero seconds time delay is adjusted to 0% RTP, or

b. With the number of OPERABLE channels one less than the Total Number of Channels, the affected Steam Generator Water Level-Low-Low channels are placed in the tripped condition.

ACTION 28 - 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 trip condition within 6 hours, and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.

TABLE 3.3-2

REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT		RESPONSE TIME
1.	Manual Reactor Trip	N.A.
2.	Power Range, Neutron Flux	≤ 0.5 second (1)
3.	Power Range, Neutron Flux, High Positive Rate	N.A.
4.	Power Range, Neutron Flux, High Negative Rate	≤ 0.5 second (1)
5.	Intermediate Range, Neutron Flux	N.A.
6.	Source Range, Neutron Flux	≤ 0.5 second (1)
7.	Overtemperature ΔT	≤ 7 seconds (1)
8.	Overpower ΔT	≤ 7 seconds (1)
9.	Pressurizer Pressure-Low	≤ 2 seconds
10.	Pressurizer Pressure-High	≤ 2 seconds
11.	Pressurizer Water Level-High	N.A.
12.	Reactor Coolant Flow-Low	
	a. Single Loop (Above P-8)	≤ 1 second
	b. Two Loops (Above P-7 and below P-8)	≤ 1 second
13.	Steam Generator Water Level-Low-Low	
	a. Steam Generator Water Level-Low-Low	≤ 2 seconds (2)
	b. RCS Loop ΔT Equivalent Power	N.A.
14.	DELETED	
15.	Undervoltage-Reactor Coolant Pumps	≤ 1.2 seconds
16.	Underfrequency-Reactor Coolant Pumps	≤ 0.6 second

(1) Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input to the first electronic component in channel.

(2) Does not include Trip Time Delays. Response times include the transmitters, Eagle-21 Process Protection cabinets, Solid State Protection System cabinets and actuation devices only. This reflects the response times necessary for THERMAL POWER in excess of 50% RTP.

3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The Engineered Safety Features 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 and with RESPONSE TIMES as shown in Table 3.3-5.

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

a. With an ESFAS Instrumentation Channel or Interlock Trip Setpoint less conservative than the value shown in the Trip Setpoint column but more conservative than the value shown in the Allowable Values column of Table 3.3-4, adjust the Setpoint consistent with the Trip Setpoint value.

b. With an ESFAS Instrumentation Channel or Interlock 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 statement requirements of Table 3.3-3 until the channel is restored to OPERABLE status with its Trip Setpoint adjusted consistent with the Trip Setpoint value.

SURVEILLANCE REQUIREMENTS

4.3.2.1 Each ESFAS instrumentation channel and interlock and the automatic actuation logic and relays shall be demonstrated OPERABLE by the performance of the Engineered Safety Feature Actuation System Instrumentation Surveillance Requirements specified in Table 4.3-2.

4.3.2.2 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be demonstrated to be within the limit at least once per 18 months. Each test shall include at least one train such that both trains are tested at least once per 36 months and one channel per function such that all channels are tested at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" column of Table 3.3-3.

TABLE 3.3-[illegible]ontinued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
3. Containment Isolation (Continued)					
2) Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	14
3) Containment Pressure-High-High	4	2	3	1, 2, 3, 4	17
c. Containment Ventilation Isolation					
1) Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3, 4	18
2) Deleted					
3) Safety Injection	See Item 1. above for all Safety Injection initiating functions and requirements.				
4) Containment Ventilation Exhaust Radiation-High (RM-44A and 44B)	2	1	2	1, 2, 3, 4	18
4. Steam Line Isolation					
a. Manual	1 manual switch/steam line	1 manual switch/steam line	1 manual switch/ operating steam line	1, 2, 3, 4	24

TABLE 3.3-[illegible]ontinued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
6. Auxiliary Feedwater					
a. Manual Initiation	1 manual switch/pump	1 manual switch/pump	1 manual switch/pump	1, 2, 3	24
b. Automatic Actuation Logic and Actuation Relays	2	1	2	1, 2, 3	22
c. Stm. Gen. Water Level-Low-Low					
1) Start Motor-Driven Pumps					
a. Steam Generator Water Level-Low-Low	3/S.G.	2/S.G. in one S.G	2/S.G. in each S.G.	1, 2, 3###	20
b. RCS Loop ΔT	4 (1/loop)	N.A.	N.A.	1, 2	29
2) Start Turbine-Driven Pump					
a. Steam Generator Water Level-Low-Low	3/S.G.	2/S.G. in any 2 S.G.	2/S.G. in each S.G.	1, 2, 3###	20
b. RCS loop ΔT	4 (1/loop)	N.A.	N.A.	1, 2	29
d. Undervoltage-RCP Bus Start Turbine-Driven Pump	2/bus	1/bus on both busses	1/bus	1	35
e. Safety Injection Start Motor-Driven Pumps	See Item 1. above for all Safety Injection initiating functions and requirements.				

TABLE 3.3-3 (Continued)

TABLE NOTATIONS

Trip function may be blocked in this MODE below the P11 (Pressurizer Pressure Interlock) Setpoint.

Trip function automatically blocked above P-11 (Pressurizer Pressure Interlock) Setpoint and is automatically blocked below P-11 when Safety Injection on Steam Line Pressure-Low is not blocked.

###For Mode 3, the Trip Time Delay associated with the Steam Generator Water Level-Low-Low channel must be less than or equal to 464.1 seconds.

ACTION STATEMENTS

ACTION 14 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 6 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, provided the other channel is OPERABLE.

ACTION 15 - Deleted

ACTION 16 - With the number of OPERABLE Channels one less than the Total Number of Channels, declare the affected Emergency Diesel Generator(s) inoperable and comply with the ACTION statements of Specification 3.8.1.1; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.

ACTION 17 - 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 met. One additional channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.

ACTION 18 - With less than the Minimum Channels OPERABLE requirement, operation may continue provided the containment purge supply and exhaust valves (RCV-11, 12, FCV 660, 661, 662, 663, 664) are maintained closed.

ACTION 19 - 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 be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ACTION 20 - 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 6 hours, and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel or one additional channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.

ACTION 21 - With less than the Minimum Number of Channels OPERABLE, within 1 hour determine by observation of the associated permissive annunciator window(s) that the interlock is in its required state for the existing plant condition, or apply Specification 3.0.3.

ACTION 22 - With the number of OPERABLE Channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 6 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 provided the other channel is OPERABLE.

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 at least HOT SHUTDOWN within the following 6 hours.

ACTION 24 - 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 declare the associated pump or valve inoperable and take the ACTION required by Specification 3.7.1.5 or 3.7.1.2 as applicable.

ACTION 25 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 6 hours or be in at least HOT STANDBY within the next 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1 provided the other channel is OPERABLE.

ACTION 29 - With the number of OPERABLE channels less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided that within 6 hours, for the affected RCS Loop Delta-T channel(s), either:

a. The Trip Time Delay threshold power level for zero seconds time delay is adjusted to 0% RTP, or

b. With the number of OPERABLE channels one less than the Total Number of Channels, the affected Steam Generator Water Level-Low-Low channels are placed in the tripped condition.

ACTION 35 - 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 trip condition within 6 hours, and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.2.1.

TABLE 3.3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
3. Containment Isolation (Continued)		
c. Containment Ventilation Isolation		
1) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
2) Deleted		
3) Safety Injection	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.	
4) Containment Ventilation Exhaust Radiation-High (RM-44A and 44B)	Per the ODCP	
4. Steam Line Isolation		
a. Manual	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
c. Containment Pressure-High-High	$\leq$ 22 psig	$\leq$ 22.3 psig
d. Steam Line Pressure-Low	$\geq$ 600 psig (Note 1)	$\geq$ 594.6 psig (Note 1)

TABLE 3.3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
e. Negative Steam Line Pressure Rate-High	≤ 100 psi (Note 3)	≤ 105.4 psi (Note 3)
5. Turbine Trip and Feedwater Isolation		
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
b. Steam Generator Water level-High-High	≤ 75% of narrow range instrument span each steam generator.	≤ 75.5% of narrow range instrument span each steam generator.
6. Auxiliary Feedwater		
a. Manual	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.
c. Steam Generator Water Level-Low-Low	≥ 7.2% of narrow range instrument span each steam generator.	≥ 6.8% of narrow range instrument span each steam generator.
Coincident with:		
1) RCS Loop ΔT Equivalent to Power ≤ 50% RTP	RCS Loop ΔT variable input ≤ 50% RTP	RCS Loop ΔT variable input ≤ 51.5% RTP
With a time delay (TD)	≤ TD (Note 2)	≤ (1.01)TD (Note 2)
Or		
2) RCS Loop ΔT Equivalent to Power > 50% RTP	RCS Loop ΔT variable input > 50% RTP	RCS Loop ΔT variable input > 51.5% RTP
With no time delay	TD = 0	TD = 0
d. Undervoltage - RCP	≥ 8050 volts	≥ 7730 volts
e. Safety Injection	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.	

TABLE 3.3-[illegible] (Continued)
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
7. Loss of Power (4.16 kV Emergency Bus Undervoltage)		
a. First Level		
1) Diesel Start	≥ 0 volts with a ≤ 0.8 second time delay and ≥ 2583 volts with a ≤ 10 second time delay. One relay	≥ 0 volts with a ≤ 0.8 second time delay and ≥ 2583 volts with ≤ 10 second time delay One relay
2) Initiation of Load Shed	≥ 0 volts with a ≤ 4 second time delay and ≥ 2583 volts with a ≤ 25 second time delay with one relay ≥ 2870 volts, instantaneous	≥ 0 volts with a ≤ 4 second time delay and ≥ 2583 volts with a ≤ 25 second time delay with one relay ≥ 2870 volts, instantaneous
b. Second Level		
1) Diesel Start	≥ 3785 volts with a ≤ 10 second time delay	≥ 3785 volts with a ≤ 10 second time delay
2) Initiation of Load Shed	≥ 3785 volts with a ≤ 20 second time delay	≥ 3785 volts with a ≤ 20 second time delay
8. Engineered Safety Features Actuation System Interlocks		
a. Pressurizer Pressure, P-11	≤ 1915 psig	≤ 1920.6 psig
b. DELETED		
c. Reactor Trip, P-4	N.A.	N.A.

NOTE 1: Time constants utilized in the lead-lag controller for Steam Pressure - Low are τ_1 = 50 seconds and τ_2 = 5 seconds.

NOTE 2: Steam Generator Water Level Low-Low Trip Time Delay

$TD = B1(P)^3 + B2(P)^2 + B3(P) + B4$

Where: P = RCS Loop ΔT Equivalent to Power (%RTP), P ≤ 50% RTP

TD = Time delay for Steam Generator Water Level Low-Low (in seconds)

B1 = -0.007128
B2 = +0.8099
B3 = -31.40
B4 = +464.1

NOTE 3: Time constants utilized in the rate-lag controller for Negative Steam Line Pressure Rate-High are τ_3 = 50 seconds and τ_4 = 50 seconds.

TABLE 3.3-5 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
7. Containment Pressure-High-High	
a. Containment Spray	≤ 48.5(6)
b. Phase "B" Isolation	N.A.
c. Steam Line Isolation	≤ 7
8. Steam Generator Water Level-High-High	
a. Turbine Trip	≤ 2.5
b. Feedwater Isolation	≤ 66
9. Steam Generator Water Level Low-Low	
a. Motor-Driven Auxiliary Feedwater Pumps	≤ 60(3)(8)
b. Turbine-Driven Auxiliary Feedwater Pump	≤ 60(8)
10. RCP Bus Undervoltage	
Turbine-Driven Auxiliary Feedwater Pump	≤ 60
11. Deleted	
12. Containment Ventilation Exhaust Radiation-High	
Containment Ventilation Isolation	≤ 11

TABLE 4.3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

SURVEILLANCE FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH IS REQUIRED
3. Containment Isolation								
a. Phase "A" Isolation								
1) Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q(4)	1, 2, 3, 4
3) Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
b. Phase "B" Isolation								
1) Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
2) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
3) Containment Pressure-High-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4
c. Containment Ventilation Isolation								
1) Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3, 4
2) Deleted								
3) Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
4) Containment Ventilation Exhaust Radiation-High (RM-44A and 44B)	S	R	M(2)	N.A.	N.A.	N.A.	N.A.	1, 2, 3, 4

TABLE 4.3-2 (Continued)
ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
4. Steam Line Isolation								
a. Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3
c. Containment Pressure-High-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
d. Steam Line Pressure-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
e. Negative Steam Line Pressure Rate-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	3(3)
5. Turbine Trip and Feedwater Isolation								
a. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2
b. Steam Generator Water Level-High-High	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2
6. Auxiliary Feedwater								
a. Manual	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	M(1)	M(1)	Q	1, 2, 3
c. Steam Generator Water Level-Low-Low								
1) Steam Generator Water Level-Low-Low	S	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3(5)
2) RCS Loop ΔT	N.A.	R	Q	N.A	N.A	N.A	N.A	1, 2

TABLE 4.3 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALI-BRATION	CHANNEL OPERA-TIONAL TEST	TRIP ACTUATING DEVICE OPERA-TIONAL TEST	ACTUATION LOGIC TEST	MASTER RELAY TEST	SLAVE RELAY TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
6. Auxiliary Feedwater (Continued)								
d. Undervoltage - RCP	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1
e. Safety Injection	See Item 1. above for all Safety Injection Surveillance Requirements.							
7. Loss of Power								
a. 4.16 kV Emergency Bus Level 1	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
b. 4.16 kV Emergency Bus Level 2	N.A.	R	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3, 4
8. Engineered Safety Feature Actuation System Interlocks								
a. Pressurizer Pressure, P-11	N.A.	R	Q	N.A.	N.A.	N.A.	N.A.	1, 2, 3
b. DELETED								
c. Reactor Trip, P-4	N.A.	N.A.	N.A.	R	N.A.	N.A.	N.A.	1, 2, 3

TABLE NOTATIONS

(1) Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.
(2) For the Containment Ventilation Exhaust Radiation - High monitor only, a CHANNEL FUNCTIONAL TEST shall be performed at least once every 31 days.
(3) Trip function automatically blocked above P-11 (Pressurizer Pressure Interlock) setpoint and is automatically blocked below P-11 when Safety Injection on Steam Line Pressure-Low is not blocked.
(4) Except relays K612A, K614B, K615A, and K615B, which shall be tested, at a minimum, once per 18 months during refueling and during each Cold Shutdown unless they have been tested within the previous 92 days.
(5) For Mode 3, the Trip Time Delay associated with the Steam Generator Water Level-Low-Low channel must be less than or equal to 464.1 seconds.

TABLE 3-6

RADIATION MONITORING INSTRUMENTATION FOR PLANT OPERATIONS

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	ACTION
1. Fuel Handling Building				
a. Storage Area				
1) Spent Fuel Pool	1	*	≤ 75 mR/hr	30 & 32**(a)
2) New Fuel Storage	1	*	≤ 15 mR/hr	30 & 32**(a)
b. Gaseous Activity				
Fuel Handling Building Ventilation Mode Change(b)	1	*	Per the ODCP	32**
2. Control Room				
Ventilation Mode Change	2***	All	≤ 2 mR/hr	34
3. Containment				
a. Gaseous Activity				
1) Deleted				
2) RCS Leakage	1	1, 2, 3, 4	N.A.	31
3) Containment Ventilation Isolation (RM-44A or 44B)	1	6	Per the ODCP	33
b. Particulate Activity				
1) Containment Ventilation Isolation (RM-44A or 44B)	1	6	Per the ODCP	33
2) RCS Leakage	1	1, 2, 3, 4	N.A.	31

*With fuel in the spent fuel pool or new fuel storage vault.
**With irradiated fuel in the spent fuel pool.
***One channel for each normal intake to the Control Room Ventilation System (common to both units).
(a)Action 32 is not applicable to the Fuel Storage Area Monitors following installation of RM-45A and 45B.
(b)The requirements for Fuel Handling Building Ventilation Mode Change are applicable following installation of RM-45A and 45B.

TABLE 3-3

RADIATION MONITORING INSTRUMENTATION FOR PLANT OPERATIONS SURVEILLANCE REQUIREMENTS

	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Fuel Handling Building				
a. Storage Area				
1) Spent Fuel Pool	S	R	M	*
2) New Fuel Storage	S	R	M	*
b. Gaseous Activity				
Fuel Handling Building Ventilation Mode Change(a)	S	R	M	*
2. Control Room				
Ventilation Mode Change	S	R	M	All
3. Containment				
a. Gaseous Activity				
1) Deleted				
2) RCS Leakage	S	R	M	1, 2, 3, 4
3) Containment Ventilation Isolation	S	R	M	6
(RM-44A or 44B)	S	R	M	6
b. Particulate Activity				
1) Containment Ventilation Isolation (RM-44A or 44B)	S	R	M	6
2) RCS Leakage	S	R	M	1, 2, 3, 4

*With fuel in the spent fuel pool or new fuel storage vault.

(a) The requirements for Fuel Handling Building Ventilation Mode Change are applicable following installation of RM-45A and 45B.

INSTRUMENTATION

ACCIDENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.6 The accident monitoring instrumentation channels shown in Table 3.3-10 shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With the number of OPERABLE accident monitoring instrumentation channels less than the Required Number of Channels shown in Table 3.3-10, restore the inoperable channel(s) to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours.

b. With the number of OPERABLE accident monitoring instrumentation channels except the containment recirculation sump level-narrow range, the main steam line radiation monitor, the containment area radiation monitor-high range, and the plant vent radiation monitor-high range less than the Minimum Channels OPERABLE requirements of Table 3.3-10, restore the inoperable channel(s) to OPERABLE status within 48 hours or be in at least HOT SHUTDOWN within the next 12 hours.

c. With the number of OPERABLE channels for the containment recirculation sump level-narrow range less than the Minimum Channels OPERABLE requirement of Table 3.3-10, restore the inoperable channel to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours.

d. With the number of OPERABLE channels for the main steam line radiation monitor, or the containment area radiation monitor-high range or the plant vent radiation monitor-high range less than the Minimum Channels OPERABLE requirements of Table 3.3-10, initiate the preplanned alternate method of monitoring the appropriate parameter(s) within 72 hours and either restore the inoperable channel(s) to OPERABLE status within 7 days or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 14 days that provides actions taken, cause of the inoperability and plans and schedule for restoring the channels to OPERABLE status.

e. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.6 Each accident monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION at the frequencies shown in Table 4.3-7.

4.4.4.1 In addition to the requirements of Specification 4.0.5, each PORV shall be demonstrated OPERABLE at least once per 18 months by:

a. Operating the PORV through one complete cycle of full travel during MODES 3 or 4 with the block valves closed, and

b. Performing a CHANNEL CALIBRATION of the actuation instrumentation.

4.4.4.2 In addition to the requirements of Specification 4.0.5, each block valve shall be demonstrated OPERABLE at least once per 92 days by operating the valve through one complete cycle of full travel unless the block valve is closed in order to meet the requirements of ACTION b. or c. in Specification 3.4.4.

4.4.4.3 The safety-related nitrogen supply for the PORVs shall be demonstrated OPERABLE at least once per 18 months by:

a. Isolating and venting the normal air supply, and

b. Verifying that any leakage of the Class 1 Backup Nitrogen System is within its limits, and

c. Operating the PORVs through one complete cycle of full travel.

4.4.9.3.1 Each Class 1 PORV shall be demonstrated OPERABLE by:

a. Performance of a CHANNEL OPERATIONAL TEST on the PORV actuation channel, but excluding valve operation, at least once per 31 days;

b. Performance of a CHANNEL CALIBRATION on the PORV actuation channel at least once per 18 months; and

c. Verifying the PORV isolation valve is open at least once per 72 hours when the PORV is being used for overpressure protection.

4.4.9.3.2 The RCS vent shall be verified to be open when the vent is being used for overpressure protection at least once per 31 days when the pathway is provided by a valve(s) that is locked, sealed, or otherwise secured in the open position; otherwise verify the vent pathway every 12 hours.

SURVEILLANCE REQUIREMENTS (Continued)

g. By verifying the correct position of each electrical and/or mechanical position stop for the following ECCS throttle valves:

1) Within 4 hours following completion of each valve stroking operation or maintenance on the valve when the ECCS subsystems are required to be OPERABLE, and

2) At least once per 18 months.

Charging Injection Throttle Valves	Safety Injection Throttle Valves
8810A	8822A
8810B	8822B
8810C	8822C
8810D	8822D

h. By performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying that:

1) For centrifugal charging pumps, with a single pump running:

a) The sum of injection line flow rates, excluding the highest flow rate, is greater than or equal to 299 gpm, and

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two independent circuits (one with delayed access) between the offsite transmission network and the Onsite Class 1E Distribution System, and

b. Three separate and independent diesel generators, each with:

1. A separate engine-mounted fuel tank containing a minimum volume of 250 gallons of fuel, and

2. Two supply trains of the Diesel Fuel Oil Storage and Transfer System containing a minimum combined storage of 33,000 gallons of fuel for one unit operation* and 65,000 gallons of fuel for two unit operation.

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

ACTION:

a. With one offsite circuit of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Specification 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter. If each of the diesel generators have not been successfully tested within the past 24 hours demonstrate its OPERABILITY by performing Specification 4.8.1.1.2a.2) separately for each such diesel generator within 24 hours. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With a diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the A.C. offsite sources by performing Specification 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; and if the diesel generator became inoperable due to any cause other than preventive maintenance or

* The performance of Technical Specification Surveillance Requirement 4.8.1.1.3.e requires one fuel oil storage tank to be removed from service to be drained and cleaned. During this surveillance, the diesel generator fuel oil storage requirement for one unit operation in Modes 1 through 4 and one unit operation in Mode 6 with at least 23 feet of water above the reactor vessel flange or with the reactor vessel defueled is 35,000 gallons. The tank being cleaned may be inoperable for up to 10 days. For the duration of tank cleaning, temporary onsite fuel oil storage of 24,000 gallons will be maintained. Prior to removal of a tank from service, the offsite circuits required by Technical Specification 3.8.1.1.a will be verified to be OPERABLE.

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.1.2 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. One circuit between the offsite transmission network and the Onsite Class 1E Distribution System, and

b. One diesel generator with:

1. A separate engine-mounted fuel tank containing a minimum volume of 250 gallons of fuel,

2. One supply train of the Diesel Fuel Oil Storage and Transfer system containing a minimum storage of 26,000 gallons* of fuel in addition to the fuel required for the other unit.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel or crane operations with loads over the fuel storage pool. In addition, when in MODE 5 with the reactor coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the requirements of Specifications 4.8.1.1.1, 4.8.1.1.2, 4.8.1.1.3, and 4.8.1.1.4, except for Specifications 4.8.1.1.1.b.2) and 4.8.1.1.2.a.2)c), b.2) for ESF timers, b.6), b.7), b.10), and b.11).

* The performance of Technical Specification Surveillance Requirement 4.8.1.1.3.e requires one fuel oil storage tank to be removed from service to be drained and cleaned. During this surveillance, the diesel generator fuel oil storage requirement for one unit operation in Modes 5 or 6 and one unit operation in Mode 6 with at least 23 feet of water above the reactor vessel flange or with the reactor vessel defueled is 35,000 gallons. The tank being cleaned may be inoperable for up to 10 days. For the duration of tank cleaning, temporary onsite fuel oil storage of 24,000 gallons will be maintained. Prior to removal of a tank from service, the offsite circuits required by Technical Specification 3.8.1.2.a will be verified to be OPERABLE.

3/4.8.2 ONSITE POWER DISTRIBUTION

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 The following electrical busses shall be energized in the specified manner:

a. 4160 volt Vital Bus F,

b. 480 volt Vital Bus F,

c. 4160 volt Vital Bus G,

d. 480 volt Vital Bus G,

e. 4160 volt Vital Bus H,

f. 480 volt Vital Bus H,

g. 120 volt Vital Instrument A.C. Bus 1 energized from its associated inverter connected to D.C. Bus 1,

h. 120 volt Vital Instrument A.C. Bus 2 energized from its associated inverter connected to D.C. Bus 2,

i. 120 volt Vital Instrument A.C. Bus 3 energized from its associated inverter connected to D.C. Bus 3,

j. 120 volt Vital Instrument A.C. Bus 4 energized from its associated inverter connected to D.C. Bus 2,

k. 125 volt D.C. Bus 1 energized from Battery Bank 1, and its associated full capacity charger,

l. 125 volt D.C. Bus 2 energized from Battery Bank 2, and its associated full capacity charger, and

m. 125 volt D.C. Bus 3 energized from Battery Bank 3, and its associated full capacity charger.

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

ACTION:

a. With one of the required 4160 volt and/or associated 480 volt vital busses not energized, re-energize them within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one vital instrument A.C. bus not energized from its associated inverter, or with one inverter not connected to its associated D.C. bus, re-energize the vital instrument A.C. bus from an alternate source within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; re-energize the vital instrument A.C. bus from its associated inverter connected to its associated D.C. bus within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With more than one full capacity charger receiving power simultaneously from a single 480 volt vital bus or any D.C. bus not receiving power from its associated A.C. division, restore the system to a configuration wherein each charger is powered from its associated 480 volt vital bus within 14 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

d. With one D.C. bus not energized from its associated battery bank and a full-capacity charger, re-energize it from its associated battery bank and a full-capacity charger within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

4.8.2.1 The specified busses shall be determined energized in the required manner at least once per 7 days by verifying correct breaker alignment and indicated voltage on the busses.

LIMITING CONDITION FOR OPERATION

3.8.2.2 As a minimum, the following electrical busses shall be energized in the specified manner:

a. One 4160 volt and its associated 480 volt A.C. vital bus,

b. Two 120 volt vital instrument A.C. busses energized from their associated inverters connected to their respective D.C. busses, and

c. One 125 volt D.C. bus energized from its associated battery bank and full-capacity charger supplied from its associated OPERABLE A.C. vital bus.

APPLICABILITY: MODES 5 and 6.

ACTION:

With any of the above required electrical busses not energized in the required manner, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, or movement of irradiated fuel, initiate corrective action to energize the required electrical busses in the specified manner as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.2.2 The specified busses shall be determined energized in the required manner at least once per 7 days by verifying correct breaker alignment and indicated voltage on the busses.

REFUELING OPERATIONS

3/4.9.2 INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.9.2 As a minimum, two Source Range Neutron Flux Monitors shall be OPERABLE each with continuous visual indication in the control room and one with audible indication in containment and the control room.

APPLICABILITY: MODE 6.

ACTION:

a. With one of the above required monitors inoperable or not operating, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes except for latching the control rod drive mechanism shaft to the rod cluster control assemblies and friction testing of individual control rods.

b. With both of the above required monitors inoperable or not operating, determine the boron concentration of the Reactor Coolant System at least once per 12 hours.

SURVEILLANCE REQUIREMENTS

4.9.2 Each Source Range Neutron Flux Monitor shall be demonstrated OPERABLE by performance of:

a. A CHANNEL CHECK at least once per 12 hours,

b. A CHANNEL OPERATIONAL TEST within 8 hours prior to the initial start of CORE ALTERATIONS, and

c. A CHANNEL OPERATIONAL TEST at least once per 7 days.

REFUELING OPERATIONS

3/4.9.9 CONTAINMENT VENTILATION ISOLATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.9.9 The Containment Ventilation Isolation System shall be OPERABLE.

APPLICABILITY: During CORE ALTERATIONS or movement of irradiated fuel within containment.

ACTION:

a. With the Containment Ventilation Isolation System inoperable, close each of the ventilation penetrations providing direct access from the containment atmosphere to the outside atmosphere.

b. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.9 The Containment Ventilation Isolation System shall be demonstrated OPERABLE within 100 hours prior to the start of and at least once per 7 days during CORE ALTERATIONS by verifying that containment ventilation isolation occurs on a High Radiation test signal from the containment ventilation exhaust radiation monitoring instrumentation channels.

SPECIAL TEST EXCEPTIONS

3/4.10.3 PHYSICS TESTS

LIMITING CONDITION FOR OPERATION

3.10.3 The limitations of Specifications 3.1.1.3, 3.1.1.4, 3.1.3.1, 3.1.3.5, and 3.1.3.6 may be suspended during the performance of PHYSICS TESTS provided:

a. The THERMAL POWER does not exceed 5% of RATED THERMAL POWER,

b. The Reactor Trip Setpoints on the OPERABLE Intermediate and Power Range channels are set at less than or equal to 25% of RATED THERMAL POWER, and

c. The Reactor Coolant System lowest operating loop temperature (T_{avg}) is greater than or equal to 531°F.

APPLICABILITY: MODE 2.

ACTION:

a. With the THERMAL POWER greater than 5% of RATED THERMAL POWER, immediately open the Reactor trip breakers.

b. With a Reactor Coolant System operating loop temperature (T_{avg}) less than 531°F, restore T_{avg} to within its limit within 15 minutes or be in at least HOT STANDBY within the next 15 minutes.

SURVEILLANCE REQUIREMENTS

4.10.3.1 The THERMAL POWER shall be determined to be less than or equal to 5% of RATED THERMAL POWER at least once per hour during PHYSICS TESTS.

4.10.3.2 Each Intermediate and Power Range channel shall be subjected to a CHANNEL OPERATIONAL TEST within 12 hours prior to initiating PHYSICS TESTS.

4.10.3.3 The Reactor Coolant System temperature (T_{avg}) shall be determined to be greater than or equal to 531°F at least once per 30 minutes during PHYSICS TESTS.

ECCS SUBSYSTEMS (Continued)

The requirement to maintain the RHR Suction Valves 8701 and 8702 in the locked closed condition in MODES 1, 2 and 3 provides assurance that a fire could not cause inadvertent opening of these valves when the RCS is pressurized to near operating pressure. These valves are not part of an ECCS subsystem.

The limitation for a maximum of one centrifugal charging pump to be OPERABLE and the Surveillance Requirement to verify all centrifugal charging pumps and Safety Injection pumps except the required OPERABLE charging pump to be inoperable below 323°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

The Surveillance Requirements provided to ensure OPERABILITY of each component ensure that, at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained. The safety analyses make assumptions with respect to minimum total system resistance, minimum and maximum total injection line resistance, and minimum individual injection line resistance. These resistances in conjunction with the ranges of potential pump performance are used to calculate the minimum and maximum ECCS flows assumed in the safety analyses.

The minimum flow Surveillance Requirement ensures that the maximum injection line resistance assumptions are met. These assumptions are used to calculate minimum flows to the RCS for safety analyses which are limited by minimum ECCS flow to the RCS.