

TABLE 3.3-1

REACTOR PROTECTIVE SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	3	1	3	1, 2, and *	1
2. Power Range, Neutron Flux and Intermediate Power Range, Neutron Flux	6	2	4	1 ⁽¹⁾ , 2, and *	2**
3. Intermediate Range, Neutron Flux, High Startup Rate	2	1	2	1 ⁽²⁾ , 2, and *	3
4. Source Range, Neutron Flux,					
a. Startup ^{##}	2	NA	2	2 [#] and *(5)	4
b. Shutdown	2	NA	1	3, 4, and 5 ⁽⁵⁾	5
5. Low Main Coolant Flow (SGDP)	4	2	3	1 ⁽³⁾	6**
6. Low Main Coolant Flow (MC Pump Current)					
a. System A	4	2	3	1 ⁽³⁾	7**
b. System B	4	2	3	1 ⁽³⁾	7**
7. High Main Coolant System Pressure	3	2	3	1 and 2 ⁽⁴⁾	6**
8. Low Main Coolant System Pressure	3	2	3	1 and 2 ⁽⁴⁾	6**
9. Intentionally Blank	-	-	-	-	-
10. Low Steam Generator Water Level	4	2	3	1 ⁽³⁾	6**

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TABLE 3.3-1 (Continued)

REACTOR PROTECTIVE SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
11. Turbine Trip	1	1	1	1(3)(6)	8
12. Generator Trip	1	1	1	1(3)(7)	8
13. Reactor Trip Breaker	2	1	2	1, 2, and *	9
14. Automatic Trip Logic	2	1	2	1, 2, and *	24
15. Main Steam Isolation Trip Logic	2	1	2	1 and 2 ⁽⁴⁾	25
16. Nuclear Instrumentation Trip Logic	2	1	2	1(1)(2) ¹ , 2, and *	24

TABLE 3.3-1 (Continued)

TABLE NOTATION

- o With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal.
- ** The provisions of Specification 3.0.4 are not applicable.
- # High voltage to detector is automatically energized prior to the Intermediate Range decreasing below 5×10^{-10} amperes.
- ## Or when other activities might increase reactivity.
- (1) Power Range Neutron Flux Low Setpoint Trip, which is associated only with the three Power Range Channels, may be manually bypassed at ≥ 15 MWe. Bypass shall be manually removed prior to decreasing below 15 MWe.
- (2) Intermediate Range Neutron Flux High Startup Rate Trip is automatically bypassed ≥ 15 MWe. Bypass is automatically removed prior to decreasing below 15 MWe.
- (3) Trip may be manually bypassed ≤ 15 MWe. Bypass is automatically removed prior to increasing above 15 MWe.
- (4) Trip may be manually bypassed when the reactor is not critical.
- (5) Startup rate alarm setpoint ≤ 1.1 decade/minute.
- (6) Turbine shall be protected by at least the following protective trips: rotor excessive axial movement, low bearing oil pressure; low condenser vacuum; and overspeed.
- (7) Generator shall be protected by at least the following protective trips: overcurrent; differential; and loss of field.

ACTION STATEMENTS

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and/or open the reactor trip breakers.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

ACTION 2 -

- a. With two Power Range and/or Intermediate Power Range channels inoperable and with the THERMAL POWER $\leq 2\%$ of RATED THERMAL POWER, set the power range high neutron level scram logic for single channel operation for both the Power Range and Intermediate Power Range instrumentation.
- b. With one Power Range or one Intermediate Power Range channel inoperable and with the THERMAL POWER level $> 2\%$ of RATED THERMAL POWER, POWER OPERATION may continue at the existing THERMAL POWER level provided the power range high neutron level scram logic is set for single channel operation for the RPS instrumentation group containing the inoperable channel.
- c. With two Power Range channels, or two Intermediate Power Range channels, or one Power Range and one Intermediate Power Range channels inoperable and with the THERMAL POWER level $> 2\%$ of RATED THERMAL POWER, POWER OPERATION may continue at the existing THERMAL POWER level provided the power range high neutron level scram logic is set for single channel operation for both the Power Range and Intermediate Power Range instrumentation.
- d. One power range high neutron level scram logic may be reset for coincidence operation in a, b, and c above for up to 2 hours per channel for surveillance testing per Specification 4.3.1.1.

ACTION 3 - With the number of OPERABLE channels one less than the Total Number of Channels and with the power level:

- a. Less than or equal to 15 MWe, restore the inoperable channel to OPERABLE status within 24 hours unless reactor power level has been increased to > 15 MWe; otherwise be in at least HOT STANDBY within the following 6 hours with the reactor trip breakers open.
- b. Above 15 MWe, POWER OPERATION may continue.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the:

- a. Reactor not critical, restore the inoperable channel to OPERABLE status prior to increasing reactor reactivity,
- b. Reactor critical, operation may continue.

ACTION 5 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1.2 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.

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

- a. The inoperable channel is placed in the tripped condition within 1 hour.
- b. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.

ACTION 7 -

- a. With the number of OPERABLE channels in either System A or B one less than the Total Number of Channels, operation may continue provided all channels in the other system are OPERABLE.
- b. With the number of OPERABLE channels in both Systems A and B one less than the Total Number of Channels in each system, STARTUP and POWER OPERATION may proceed provided both of the following conditions are satisfied:
 - 1) The inoperable channels are placed in the tripped condition within 1 hour.
 - 2) The Minimum Channels OPERABLE requirement for each System is met; however, one additional channel in either system may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

- ACTION 8 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours.
- ACTION 9 - With the number of channels OPERABLE one less than required by the Minimum Channels Operable requirement, be in at least HOT STANDBY within 6 hours with reactor trip breakers open.
- ACTION 24 - a. With the number of channels OPERABLE one less than required by the Minimum Channels Operable requirement, be in at least HOT STANDBY within 6 hours with reactor trip breakers open.
- b. With the Minimum Channels OPERABLE requirement met, one channel at a time may be bypassed for up to 2 hours for surveillance testing of FUNCTIONAL UNIT 15 or 16 per Specification 4.3.1.1. In this application CHANNEL refers to a train of trip logic.
- ACTION 25 - a. With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours.
- b. With the Minimum Channels OPERABLE requirement met, one channel at a time may be bypassed for up to 2 hours for surveillance testing of FUNCTIONAL UNIT 15 or 16 per Specification 4.3.1.1. In this application CHANNEL refers to a train of trip logic.

TABLE 4.3-1

REACTOR PROTECTIVE SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
1. Manual Reactor Trip	NA	NA	S/U(1)	NA
2. Power Range, Neutron Flux and Intermediate Power Range, Neutron Flux	S	D(2), Q(5)	M	1, 2, and *
3. Intermediate Range, Neutron Flux, High Startup Rate	S	R(5)	M	1, 2, and *
4. Source Range, Neutron Flux	S	R(5)	S/U(1)	2, 3, 4, 5, and *
5. Low Main Coolant Flow (SGAP)	S	R(4)	M(3)	1
6. Low Main Coolant Flow, Systems A and B (MC Pump Current)	S	R	M	1
7. High Main Coolant System Pressure	S	R(4)	M	1 and 2
8. Low Main Coolant System Pressure	S	R(4)	M	1 and 2
9. Intentionally Blank	-	-	-	-
10. Low Steam Generator Water Level	S	R(4)	M	1

TABLE 4.3-1 (Continued)

REACTOR PROTECTIVE SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
11. Turbine Trip	NA	NA	S/U(1)	1
12. Generator Trip	NA	NA	S/U(1)	1
13. Reactor Trip Breaker	NA	NA	S/U(1)	1, 2, and *
14. Automatic Trip Logic	NA	NA	S/U(1)	1, 2, and *
15. Main Steam Isolation Trip Logic	NA	NA	Q(6)	1 and 2
16. Nuclear Instrumentation Trip Logic	NA	NA	Q(6)	1, 2, and *

TABLE 4.3-1 (Continued)

NOTATION

- * - With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal.
- (1) - If not performed in the previous 7 days.
- (2) - Heat balance only, above 15% of RATED THERMAL POWER, at least 3 times per week with a maximum time interval of 72 hours.
- (3) - When shutdown longer than 24 hours, if not performed in the previous 31 days.
- (4) - Known pressure applied to sensor.
- (5) - Neutron detectors may be excluded from CHANNEL CALIBRATION.
- (6) - Contacts or contact combinations in the logic circuit may be simulated to operate relays in the trip logic circuit.

TABLE 3.3-2 (Continued)

ENGINEERING SAFEGUARDS SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS AND SENSORS	CHANNELS AND SENSORS TO TRIP	MINIMUM CHANNELS AND SENSORS OPERABLE	APPLICABLE MODES	ACTION
2. CONTAINMENT ISOLATION (Continued)					
c. Actuation Channel B	1	1	1	1, 2, 3, 4	10
1) High Containment Pressure Sensor	1	1	1	1, 2, 3, 4	10
2) Safety Injection	(All Safety Injection Initiating Functions and Requirements)				
3. MAIN STEAM ISOLATION					
a. Low Steam Line Pressure	3/Steam Line	2/Steam Line	3/Steam Line	1, 2, 3(2)	6**
b. Automatic Trip Logic	2	1	2	1, 2, 3(2)	26
c. Manual Initiation	2	1	2	1, 2	26
d. High Containment Pressure Trip Containment Isolation	2	1	2	1, 2	26
4. LOSS OF POWER 480 VOLT EMERGENCY BUS					
a. Loss of Voltage (First Level)	1/Bus	1/Bus	1/Bus	1, 2, 3	23
b. Degraded Voltage (Second Level)	2/Bus	2/Bus	2/Bus	1, 2, 3	22**

TABLE 3.3-2 (Continued)

TABLE NOTATION

** The provisions of Specification 3.0.4 are not applicable.

- (1) Trip function may be bypassed in this MODE with main coolant pressure <300 psig.
- (2) Trip function may be bypassed in this MODE with main coolant pressure <1800 psig and main coolant temperature <470°F.
- (3) Automatic initiation of Actuation Channel #1 may be bypassed in this MODE during functional test of the Main Coolant System Loop 1 pressure channel.

Automatic initiation of Actuation Channel #2 may be bypassed in this MODE during functional test of the Main Coolant System Loop 2 pressure channel.

ACTION STATEMENTS

- ACTION 10 - With the number of OPERABLE channels or sensors one less than the total number of channels or sensors, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours; however, one safety injection channel high containment pressure sensor may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.
- ACTION 6 - With the number of OPERABLE channels one less than the total number of channels, STARTUP and POWER OPERATION may proceed provided both of the following conditions are satisfied:
1. The inoperable channel is placed in the tripped condition within one hour.
 2. The minimum channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.
- ACTION 22 - With the number of OPERABLE channels one less than the total number of channels, STARTUP and/or POWER OPERATION may proceed until performance of the next required CHANNEL FUNCTIONAL TEST provided the inoperable channel is placed in the tripped condition within 1 hour.

ACTION STATEMENTS
(Continued)

ACTION 23 - With the number of OPERABLE channels or sensors one less than the total number of channels or sensors, restore the inoperable bus to operable status within eight hours or be in at least HOT STANDBY within the next six hours and in COLD SHUTDOWN within the following 30 hours.

ACTION 26 - a. With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours.

b. With the Minimum Channels OPERABLE requirement met, one channel at a time may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1. In this application CHANNEL refers to a train of trip logic.

TABLE 4.3-2 (Continued)

ENGINEERED SAFEGUARDS SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNELS CALIBRATIONS</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
2. CONTAINMENT ISOLATION (Continued)				
c. Actuation Channel B	S	NA	M(4)	1, 2, 3, 4
1) High Containment Pressure Sensor	S	R(3)	M(3)	1, 2, 3, 4
2) Safety Injection:		(All Safety Injection Surveillance Requirements)		
3. MAIN STEAM ISOLATION				
a. Low Steam Line Pressure	S	R(3)	M(3)	1, 2
b. Automatic Trip Logic	NA	NA	Q(5)	1, 2
c. Manual Initiation	NA	NA	R	1, 2
d. High Containment Pressure	NA	NA	R	1, 2
4. LOSS OF POWER 480 VOLT EMERGENCY BUS				
a. Loss of Voltage (First Level)	NA	R	R	1, 2, 3
b. Degraded Voltage (Second Level)	NA	R	M	1, 2, 3

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Amendment No. 82, 83, 84, 89,
107, 109

TABLE 4.3-2 (Continued)

TABLE NOTATION

- (1) When shut down with main coolant pressure <1000 psig, if not performed within the previous 31 days.
- (2) When shut down longer than 24 hours, if not performed in the previous 31 days.
- (3) The test shall include exercising the sensor by applying either a vacuum or pressure to the appropriate side of the sensor.
- (4) When in COLD SHUTDOWN with main coolant pressure <300 psig, if not performed within the previous 31 days.
- (5) Contacts or contact combinations in the logic circuit may be simulated to operate relays in the trip logic circuit.

*Not required in this MODE with main coolant pressure <300 psig.

#Not required in this MODE with main coolant pressure <1700 psig.

TABLE 3.3-6

FIRE DETECTION INSTRUMENTS

INSTRUMENTATION LOCATION	MINIMUM INSTRUMENTS OPERABLE
1. Control Room Above Dropped Ceiling Control Boards Main Control Board SI Panels NI Panel General Area	9 3 1/Panel 1 9
2. Cable Spreading Cable Tray House Manhole No. 3	2 1
3. Switchgear Room Battery Room No. 1 Battery Room No. 2	20 1 1
4. Diesel Generators No. 1 No. 2 No. 3	1 1 1
5. Safety Injection Pumps and No. 3 Battery	5
6. Charging Pump Cubicles No. 1 No. 2 No. 3	1 1 1
7. 1 & 2 Charcoal Filters	1/Filter
8. Turbine Building Transformer Oil Cooler Area Turbine Lube Oil Reservoir	2 2
9. Vapor Container	1
10. PICS Building	1
11. Non-Return Valve (NRV) Enclosure	2

3/4.7 PLANT SYSTEMS

3/4.7.1 TURBINE CYCLE

SAFETY VALVES

LIMITING CONDITION FOR OPERATION

3.7.1.1 All main steam line code safety valves associated with each steam generator of an unisolated main coolant loop shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

- a. With 4 main coolant loops and associated steam generators in operation and with one or more main steam line code safety valves inoperable:
 - 1. Operation in MODES 1, 2, and 3 may proceed provided, that within 4 hours, either:
 - a) The inoperable valve(s) is restored to OPERABLE status, or
 - b) The three Power Range and the three Intermediate Power Range Neutron Flux channels are OPERABLE** with:
 - 1) The Power Range and Intermediate Power Range Neutron Flux - High Setpoint trips reduced per Table 3.7-1.
 - 2) The Power Range and Intermediate Power Range Scram logic set for single channel operation.**
 - 2. Otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.1.1 Each main steam line code safety valve shall be demonstrated OPERABLE, with lift settings and orifice sizes as shown in Table 4.7-1, in accordance with Section XI of the ASME Boiler and Pressure Vessel Code, 1974 Edition, and Addenda through Summer, 1975.

** One Power Range or Intermediate power Range Neutron Flux channel may be made inoperable and its associated (Power Range or Intermediate Power Range) scram logic reset for coincidence operation for up to 2 hours (per channel) for required surveillance per Specification 4.3.1.1.

SPECIAL TEST EXCEPTIONS

PRESSURE/TEMPERATURE LIMITATION - REACTOR CRITICALITY

LIMITING CONDITION FOR OPERATION

3.10.3 The minimum temperature and pressure conditions for reactor criticality of Specification 3.4.8.1 may be suspended during low temperature PHYSICS TESTS provided:

- a. The THERMAL POWER does not exceed 2 percent of RATED THERMAL POWER,
- b. The reactor high setpoint trips on the three OPERABLE Power Range Nuclear Channels and the reactor high setpoint trips on the three OPERABLE Intermediate Power Range Nuclear Channels are set at $\leq 25\%$ of RATED THERMAL POWER, and
- c. The Main Coolant System temperature and pressure are maintained $\geq 250^{\circ}\text{F}$ and ≥ 300 psig, respectively.

APPLICABILITY: MODE 2.

ACTION:

- a. With the THERMAL POWER > 2 percent of RATED THERMAL POWER, immediately open the reactor trip breakers.
- b. With the Main Coolant System temperature and pressure $< 250^{\circ}\text{F}$ or < 300 psig, immediately open the reactor trip breakers and restore the temperature-pressure to within its limit within 30 minutes; perform the analysis required by Specification 3.4.8.1 prior to the next reactor criticality.

SURVEILLANCE REQUIREMENTS

4.10.3.1 The Main Coolant System temperature and pressure shall be verified to be $\geq 250^{\circ}\text{F}$ and ≥ 300 psig at least once per hour.

4.10.3.2 The THERMAL POWER shall be determined to be $\leq 2\%$ of RATED THERMAL POWER at least once per hour.

4.10.3.3 Each Power Range and Intermediate Power Range Nuclear Channel shall be subjected to a CHANNEL FUNCTIONAL TEST within 12 hours prior to initiating low temperature PHYSICS TESTS.

SPECIAL TEST EXCEPTIONS

PHYSICS TESTS

LIMITING CONDITION FOR OPERATION

3.10.4 The limitations of Specifications 3.1.1.4, 3.1.3.1, 3.1.3.4, and 3.1.3.5, may be suspended during the performance of PHYSICS TESTS provided:

- a. The THERMAL POWER does not exceed 2% of RATED THERMAL POWER, and
- b. The reactor high setpoint trips on the three OPERABLE Power Range Nuclear Channels and the reactor high setpoint trips on the three OPERABLE Intermediate Power Range Nuclear Channels are set at $\leq 25\%$ of RATED THERMAL POWER.

APPLICABILITY: MODE 2.

ACTION:

With the THERMAL POWER $> 2\%$ of RATED THERMAL POWER, immediately open the reactor trip breakers.

SURVEILLANCE REQUIREMENTS

4.10.4.1 The THERMAL POWER shall be determined to be $\leq 2\%$ of rated THERMAL POWER at least once per hour during PHYSICS TESTS.

4.10.4.2 Each Power Range and Intermediate Power Range Nuclear Channel shall be subjected to a CHANNEL FUNCTIONAL TEST within 12 hours prior to initiating PHYSICS TESTS.