

TABLE 3-3-1

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	2	1	2	1, 2	1
2. Power Range, Neutron Flux	2	1	2	3 ^d , 4 ^a , 5 ^d	9
a. High Setpoint	4	2	3	1, 2	2
b. Low Setpoint	4	2	3	1 ^c , 2	2
3. Power Range, Neutron Flux High Positive Rate	4	2	3	1, 2	2
4. Power Range, Neutron Flux, High Negative Rate	4	2	3	1, 2	2
5. Intermediate Range, Neutron Flux	2	1	2	1 ^c , 2	1
6. Source Range, Neutron Flux					
a. Reactor Trip and Indication	2	1	2	2 ^b	4
1) Startup	2	1	2	3, 4, 5	5.1
2) Shutdown					5.1, 5.2
b. Boron Dilution Flux Doubling [*]	2	1	2	3 ^b , 4, 5	17
7. Overtemperature N-16	4	2	3	1, 2	17
8. Overpower N-16	4	2	3	1, 2	17
9. Pressure/Temp Pressure-Low	4	2	3	1 ^d	6 ^e
10. Pressure/Temp Pressure-High	4	2	3	1, 2	6

*Boron Dilution Flux Doubling requirements become effective for Unit 1 six months after criticality for Cycle 3 and for Unit 2 six months after initial criticality.

TABLE 3.3-1 (Continued)

TABLE NOTATIONS

- ^aOnly if the reactor trip breakers happen to be in the closed position and the Control Rod Drive System is capable of rod withdrawal.
- ^bBelow the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint.
- ^cBelow the P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.
- ^dAbove the P-7 (At Power) Setpoint.
- ^eThe applicable MODES and ACTION statements for these channels noted in Table 3.3-2 are more restrictive and therefore, applicable.
- ^fAbove the P-8 (3-loop flow permissive) Setpoint.
- ^gAbove the P-7 and below the P-8 Setpoints.
- ^hThe boron dilution flux doubling signals may be blocked during reactor startup.
- ⁱAbove the P-9 (Reactor trip on Turbine trip Interlock) Setpoint.

ACTION STATEMENTS

- ACTION 1 - 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 ∞ in HOT STANDBY within the next 6 hours.
- ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:
- The inoperable channel is placed in the tripped condition within 6 hours,
 - 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, and
 - Either, THERMAL POWER is restricted to less than or equal to 75% of RATED THERMAL POWER and the Power Range Neutron Flux Trip Setpoint is reduced to less than or equal to 55% of RATED THERMAL POWER within 4 hours, or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours per Specification 4.2.4.2.

*Boron Dilution Flux Doubling requirements become effective for Unit 1 six months after criticality for Cycle 3 and for Unit 2 six months after initial criticality.

ACTION 3 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

- a. Below the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.
- b. Above the P-6 (Intermediate Range Neutron Flux Interlock) Setpoint but below 10% of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 10% of RATED THERMAL POWER.

ACTION 4 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, suspend all operations involving positive reactivity changes.

ACTION 5.1 - 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 within the next hour open the reactor trip breakers, suspend all operations involving positive reactivity changes, and verify either valve ICS-8435 or valves ICS-8560, FCV-111B, ICS-8439, ICS-8441, and ICS-8483 are closed and secured in position, and verify this position at least once per 14 days thereafter. With no channels OPERABLE complete the above actions within 4 hours, and verify the positions of the above valves at least once per 14 days thereafter.

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

- a. The inoperable channel is placed in the tripped condition within 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.

ACTION 7 - 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 3.3.1.

*Boron Dilution Flux Doubling requirements become effective for Unit 1 six months after criticality for Cycle 3 and for Unit 2 six months after initial criticality.

INSERT A

ACTION 5.2* - 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 within the next hour verify either valve ICS-8455 or valves ICS-8560, FCV-111B, ICS-8439, ICS-8441, and ICS-8453 are closed and secured in position, and verify this position at least once per 14 days thereafter. With no channels OPERABLE, complete the above actions within 4 hours and verify the positions of the above valves at least once per 14 days thereafter.

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	ANALOG CHANNEL OPERATIONAL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	ACTUATION LOGIC TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
1. Manual Reactor Trip	N.A.	N.A.	N.A.	R(14)	N.A.	1, 2, 3 ^a , 4 ^a
2. Power Range, Neutron Flux	5	D(2, 4), M(3, 4), Q(4, 6), R(4, 5)	Q	N.A.	N.A.	1, 2
a. High Setpoint						
b. Low Setpoint	5	R(4)	S/U(1)	N.A.	N.A.	1 ^c , 2
3. Power Range, Neutron Flux, N.A. High Positive Rate	N.A.	R(4)	Q	N.A.	N.A.	1, 2
4. Power Range, Neutron Flux, N.A. High Negative Rate	N.A.	R(4)	Q	N.A.	N.A.	1, 2
5. Intermediate Range, Neutron Flux	5	R(4, 5)	S/U(1)	N.A.	N.A.	1 ^c , 2
6. Source Range, Neutron Flux	5	R(4, 13)	S/U(1), Q(9)	R(12) [*]	N.A.	2 ^d , 3, 4, 5
7. Overtemperature R-16	5	D(2, 4) M(3, 4) Q(4, 6) R(4, 5)	Q	N.A.	N.A.	1, 2
8. Overpower N-16	5	D(2, 4) R(4, 5)	Q	N.A.	N.A.	1, 2
9. Pressurizer Pressure--Low	5	R	Q(8)	R.A.	N.A.	1 ^d
10. Pressurizer Pressure--High	5	R	Q	N.A.	N.A.	1, 2

*Boron Dilution Flux Doubling requirements became effective for Unit 1 six months after criticality for Cycle 3 and for Unit 2 six months after initial criticality.

TABLE 4.3-1 (Continued)

TABLE NOTATIONS

- ^a Only if the reactor trip breakers happen to be in the closed position and the Control Rod Drive System is capable of rod withdrawal.
- ^b Below P-6 (Intermediate Range Neutron Flux Interlock) Setpoint.
- ^c Below P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.
- ^d Above the P-7 (At Power) Setpoint.
- ^e Above the P-9 (Reactor trip on Turbine trip Interlock) Setpoint.
- (1) If not performed in previous 31 days.
- (2) Comparison of calorimetric to excore power and N-16 power indication above 15% of RATED THERMAL POWER. Adjust excore channel and/or N-16 channel gains consistent with calorimetric power if absolute difference of the respective channel is greater than 2%. The provisions of Specification 4.0.4 are not applicable for entry into MODE 1 or 2.
- (3) Single point comparison of incore to excore AXIAL FLUX DIFFERENCE above .5% of RATED THERMAL POWER. Recalibrate if the absolute difference is greater than or equal to 3%. For the purpose of these surveillance requirements, "M" is defined as at least once per 31 EFPD. The provisions of Specification 4.0.4 are not applicable for entry into MODE 1 or 2.
- (4) Neutron and N-16 detectors may be excluded from CHANNEL CALIBRATION.
- (5) Detector plateau curves shall be obtained and evaluated. For the Intermediate Range Neutron Flux, Power Range Neutron Flux and N-16 channels the provisions of Specification 4.0.4 are not applicable for entry into MODE 1 or 2.
- (6) Incore - Excore Calibration, above 75% of RATED THERMAL POWER. For the purpose of these surveillance requirements "Q" is defined as at least once per 92 EFPD. The provisions of Specification 4.0.4 are not applicable for entry into MODE 1 or 2.
- (7) Each train shall be tested at least every 62 days on a STAGGERED TEST BASIS.
- (8) The MODES specified for these channels in Table 4.3-2 are more restrictive and therefore applicable.
- (9) Quarterly surveillance in MODES 3^a, 4^a, and 5^a shall also include verification that permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window. Quarterly surveillance shall include verification of the Boron Dilution Alarm Setpoint of less than or equal to an increase of twice the count rate within a 10-minute period.*

*Boron Dilution Flux Doubling requirements become effective for Unit 1 six months after criticality for Cycle 3 and for Unit 2 six months after initial criticality.

TABLE 4.3-1 (Continued)

TABLE NOTATIONS (Continued)

- (10) Setpoint verification is not applicable.
- (11) The TRIP ACTUATING DEVICE OPERATIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip attachments of the reactor trip breakers.
- (12) At least once per 18 months during shutdown, verify that on a simulated Boron Dilution Flux Doubling test signal the normal CVCS discharge valves close and the centrifugal charging pumps suction valves from the RWST open.
- (13) With the high voltage setting varied as recommended by the manufacturer, an initial discriminator bias curve shall be measured for each detector. Subsequent discriminator bias curves shall be obtained, evaluated and compared to the initial curves.
- (14) The TRIP ACTUATING DEVICE OPERATIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the Manual Reactor Trip Function. The test shall also verify the OPERABILITY of the Bypass Breaker trip circuit(s).
- (15) Local manual shunt trip prior to placing breaker in service.
- (16) Automatic undervoltage trip.

*Boron Dilution Flux Doubling requirements become effective for Unit 1 six months after criticality for Cycle 3 and for Unit 2 six months after initial criticality.