3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR PROTECTIVE INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1.1 As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1 shall be OPERABLE.

APPLICABILITY: As shown in Table 3.3-1.

ACTION: As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

4.3.1.1.1 Each reactor protective instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the MODES and at the frequencies shown in Table 4.3-1.

4.3.1.1.2 The logic for the bypasses shall be demonstrated OPERABLE prior to each reactor STARTUP unless performed during the preceding 92 days. The total bypass function shall be demonstrated OPERABLE at least once per 18 months (**) during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

4.3.1.1.3 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit at least once per 18 months. Each test shall include at least one channel per function such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-1.

** For Cycle 12, the Steam Generator Low Pressure Trip Bypass surveillance shall be due by March 31, 1996.

* Neutron detectors are exempt from response time testing.

TABLE 4.3-1

REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
1. Manual Reactor Trip	NA	NA	S/U(1)	NA
2. Power Level - High				
a. Nuclear Power	S	D(2), M(3), Q(5)	Q	1, 2
b. ΔT Power	S	D(4) R(6)	Q	1
3. Reactor Coolant Flow - Low	S	R(6)	Q	1, 2
4. Pressurizer Pressure - High	S	R(6)	Q	1, 2
5. Containment Pressure - High	S	R	Q	1, 2
6. Steam Generator Pressure - Low	S	R(6)	Q	1, 2
7. Steam Generator Water Level - Low	S	R(6)	Q	1, 2
8. Axial Flux Offset	S	R	Q	1
9. a. Thermal Margin/Low Pressure	S	R(6)	Q	1, 2
b. Steam Generator Pressure Difference - High	S	R(6)	Q	1, 2
10. Loss of Load	NA	NA	S/U(1)	NA

TABLE 4.3-1 (Continued)

TABLE NOTATION

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

(1) If not performed in previous 7 days.

(2) Heat balance only, above 15% of RATED THERMAL POWER; adjust "Nuclear Power Calibrate" potentiometers to make the nuclear power signals agree with calorimetric calculation if absolute difference is > 1.5%. During PHYSICS TESTS, these daily calibrations of nuclear power and ΔT power may be suspended provided these calibrations are performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau.

(3) Above 15% of RATED THERMAL POWER, recalibrate the excore detectors which monitor the AXIAL SHAPE INDEX by using the incore detectors or restrict THERMAL POWER during subsequent operations to ≤ 90% of the maximum allowed THERMAL POWER level with the existing Reactor Coolant Pump combination.

(4) Above 15% of RATED THERMAL POWER, adjust "ΔT Pwr Calibrate" potentiometers to null "Nuclear Pwr - ΔT Pwr." During PHYSICS TESTS, these daily calibrations of nuclear power and ΔT power may be suspended provided these calibrations are performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau.

(5) Neutron detectors may be excluded from CHANNEL CALIBRATION.

(6) For Cycle 12, the surveillance shall be due by March 31, 1996

3/4.3 INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

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

APPLICABILITY: As shown in Table 3.3-3.

ACTION:

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

b. With an ESFAS instrumentation channel inoperable, take the ACTION shown in Table 3.3-3.

SURVEILLANCE REQUIREMENTS

4.3.2.1.1 Each ESFAS instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the MODES and at the frequencies shown in Table 4.3-2.

4.3.2.1.2 The logic for the bypasses shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by bypass operation. The total bypass function shall be demonstrated OPERABLE at least once per 18 months* during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

4.3.2.1.3 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 channel per function such that all channels are tested at least once every 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.

* For Cycle 12, the surveillance shall be due by March 31, 1996.

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
1. SAFETY INJECTION (SIAS)				
a. Manual (Trip buttons)	NA	NA	R(7)	NA
b. Containment Pressure - High	S	R(7)	Q	1, 2, 3
c. Pressurizer Pressure - Low	S	R(7)	Q	1, 2, 3
d. Automatic Actuation Logic	NA	NA	M(1)(2)(3)	1, 2, 3
2. CONTAINMENT SPRAY (CSAS)				
a. Manual (Trip buttons)	NA	NA	R(7)	NA
b. Containment Pressure - High	S	R	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA	M(1)(6)	1, 2, 3
3. CONTAINMENT ISOLATION (CIS)#				
a. Manual CIS (Trip buttons)	NA	NA	R(7)	NA
b. Containment Pressure - High	S	R	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA	M(1)(4)	1, 2, 3

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED	
4. MAIN STEAM LINE ISOLATION (SGIS)					
a. Manual SGIS (MSIV Hand Switches and Feed Head Isolation Hand Switches)	NA	NA	R(7)	NA	
b. Steam Generator Pressure - Low	S	R(7)	Q	1, 2, 3	—
c. Automatic Actuation Logic	NA	NA	M(1)(5)	1, 2, 3	
5. CONTAINMENT SUMP RECIRCULATION (RAS)					
a. Manual RAS (Trip Buttons)	NA	NA	R(7)	NA	
b. Refueling Water Tank - Low	NA	R	Q	1, 2, 3	—
c. Automatic Actuation Logic	NA	NA	M(1)	1, 2, 3	
6. CONTAINMENT PURGE VALVES ISOLATION					
a. Manual (Purge Valve Control Switches)	NA	NA	R	NA	
b. Containment Radiation - High Area Monitor	S	R	Q	6**	—

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED	
7. LOSS OF POWER					
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	NA	R	Q	1, 2, 3	—
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	NA	R	Q	1, 2, 3	—
8. CVCS ISOLATION					
West Penetration Room/Letdown Heat Exchanger Room Pressure - High	NA	R	Q	1, 2, 3, 4	—
9. AUXILIARY FEEDWATER					
a. Manual (Trip Buttons)	NA	NA	R	NA	—
b. Steam Generator Level - Low	S	R	Q	1, 2, 3	
c. Steam Generator ΔP - High	S	R	Q	1, 2, 3	
d. Automatic Actuation Logic	NA	NA	M(1)	1, 2, 3	

TABLE 4.3-2 (Continued)

TABLE NOTATION

Containment isolation of non-essential penetrations is also initiated by SIAS (functional units 1.a and 1.c).

** Must be OPERABLE only in MODE 6 when the valves are required OPERABLE and they are open.

(1) The logic circuits shall be tested manually at least once per 31 days.

(2) SIAS logic circuits A-10 and B-10 shall be tested monthly with the exception of the Safety Injection Tank isolation valves. The SIAS logic circuits for these valves are exempted from testing during operation; however, these logic circuits shall be tested at least once per 18 months* during shutdown.

(3) SIAS logic circuits A-5, and B-5 are exempted from testing during operation; however, these logic circuits shall be tested at least once per 18 months* during shutdown.

(4) CIS logic circuits A-5 and B-5 are exempted from testing during operation; however, these logic circuits shall be tested at least once per 18 months* during shutdown.

(5) SGIS logic circuits A-1 and B-1 are exempted from testing during operation; however, these logic circuits shall be tested at least once per 18 months* during shutdown.

(6) CSAS logic circuits A-3 and B-3 are exempted from testing during operation; however, these logic circuits shall be tested at least once per 18 months* during shutdown.

(7) For Cycle 12, the surveillance shall be due by March 31, 1996.

* For Cycle 12, the surveillance shall be due by March 31, 1996.

TABLE 4.3-3

RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
1. AREA MONITORS				
a. Containment				
i. Purge & Exhaust Isolation	S	R	M	6
b. Containment Area High Range	S	R*	M	1, 2, 3, & 4
2. PROCESS MONITORS				
a. Containment				
i. Gaseous Activity				
a) RCS Leakage Detection	S	R	M	1, 2, 3, & 4
ii. Particulate Activity				
a) RCS Leakage Detection	S	R	M	1, 2, 3, & 4
b. Noble Gas Effluent Monitors				
i. Main Vent Wide Range	S	R	M	1, 2, 3, & 4
ii. Main Steam Header	S	R	M	1, 2, 3, & 4

*For Cycle 12, the surveillance shall be due by March 31, 1996

TABLE 4.3-6

REMOTE SHUTDOWN MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION
1. Wide Range Neutron Flux	M	NA
2. Reactor Trip Breaker Indication	M	NA
3. Reactor Coolant Cold Leg Temperature	M	R*
4. Pressurizer Pressure	M	R*
5. Pressurizer Level	M	R*
6. Steam Generator Level (Wide Range)	M	R*
7. Steam Generator Pressure	M	R*

* For Cycle 12, the surveillance shall be due by March 31, 1996.

TABLE 4.3-10

POST-ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION
1. Containment Pressure	M	R
2. Wide Range Logarithmic Neutron Flux Monitor	M	NA
3. Reactor Coolant Outlet Temperature	M	R**
4. Pressurizer Pressure	M	R**
5. Pressurizer Level	M	R**
6. Steam Generator Pressure	M	R**
7. Steam Generator Level (Wide Range)	M	R**
8. Auxiliary Feedwater Flow Rate	M	R**
9. RCS Subcooled Margin Monitor	M	R
10. PORV/Safety Valve Acoustic Monitor	M	R**
11. PORV Solenoid Power Indication	NA	R**
12. Feedwater Flow	NA	NA
13. Containment Water Level (Wide Range)	M	R**
14. Reactor Vessel Water level	M	R**
15. Core Exit Thermocouple System	M	NA
	M	R*

* The performance of a CHANNEL CALIBRATION operation exempts the Core Exit Thermocouple but includes all electronic components. The Core Exit Thermocouple shall be calibrated prior to installation in the reactor core.

** For Cycle 12, the surveillance shall be due by March 31, 1996.

SURVEILLANCE REQUIREMENTS

4.4.3.1 Each PORV shall be demonstrated OPERABLE:

a. At least once per 31 days by performance of a CHANNEL FUNCTIONAL TEST, in accordance with Table 4.3-1, Item 4.

b. At least once per 18 months* by performance of a CHANNEL CALIBRATION.

4.4.3.2 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 to meet the requirements of Action a, b, or c in Specification 3.4.3.

*For Cycle 12, the surveillance shall be due by March 31, 1996.

SURVEILLANCE REQUIREMENTS

4.4.6.1 The Leakage Detection Systems shall be demonstrated OPERABLE by:

a. Containment Atmosphere Gaseous and Particulate Monitoring Systems-performance of CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST at the frequencies specified in Table 4.3-3, and

b. Containment Sump Level Alarm System-performance of CHANNEL CALIBRATION at least once per 18 months.*

* For Cycle 12, the surveillance shall be due by March 31, 1996.

LIMITING CONDITION FOR OPERATION (Continued)

2. Verify the excessive flow condition did not raise pressure above the maximum allowable pressure for the given RCS temperature on Figure 3.4.9-1 or Figure 3.4.9-2.

3. If a pressure limit was exceeded, take action in accordance with Specification 3.4.9.1.

h. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.9.3.1 Each PORV shall be demonstrated OPERABLE by: *

a. Performance of a CHANNEL FUNCTIONAL TEST on the PORV actuation channel, but excluding valve operation, within 31 days prior to entering a condition in which the PORV is required OPERABLE and at least once per 31 days thereafter when the PORV is required OPERABLE.

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

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

d. Testing in accordance with the inservice test requirements pursuant to Specification 4.0.5.

4.4.9.3.2 The RCS vent(s) shall be verified to be open at least once per 12 hours when the vent(s) is being used for overpressure protection.

4.4.9.3.3 All high pressure safety injection pumps, except the above OPERABLE pump, shall be demonstrated inoperable at least once per 12 hours by verifying that the motor circuit breakers have been removed from their electrical power supply circuits or by verifying their discharge valves are locked shut. The automatic opening feature of the high pressure safety injection loop MOVs shall be verified disabled at least once per 12 hours. The above OPERABLE pump shall be verified to have its handswitch in pull-to-lock at least once per 12 hours.

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* Except when the vent pathway is locked, sealed, or otherwise secured in the open position, then verify these vent pathways open at least once per 31 days.

** For Cycle 12, the surveillance shall be due by March 31, 1996.