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)	~~M~~ Q	1, 2
b. ΔT Power	S	D(4),R	~~M~~ Q	1
3. Reactor Coolant Flow - Low	S	R	~~M~~ Q	1, 2
4. Pressurizer Pressure - High	S	R	~~M~~ Q	1, 2
5. Containment Pressure - High	S	R	~~M~~ Q	1, 2
6. Steam Generator Pressure - Low	S	R	~~M~~ Q	1, 2
7. Steam Generator Water Level - Low	S	R	~~M~~ Q	1, 2
8. Axial Flux Offset	S	R	~~M~~ Q	1
9. a. Thermal Margin/Low Pressure	S	R	~~M~~ Q	1, 2
b. Steam Generator Pressure Difference - High	S	R	~~M~~ Q	1, 2
10. Loss of Load	NA	NA	S/U(1)	NA

TABLE 4.3-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
11. Wide Range Logarithmic Neutron Flux Monitor	S	R(5)	S/U(1)	1, 2, 3, 4, 5 and
12. Reactor Protection System Logic Matrices	NA	NA	Q M and S/U(1)	1, 2
13. Reactor Protection System Logic Matrix Relays	NA	NA	Q M and S/U(1)	1, 2
14. Reactor Trip Breakers	NA	NA	M	1, 2 and *

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	NA
b. Containment Pressure - High	S	R	M Q	1, 2, 3
c. Pressurizer Pressure - Low	S	R	M 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	NA
b. Containment Pressure - High	S	R	M 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	NA
b. Containment Pressure - High	S	R	M 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	NA
b. Steam Generator Pressure - Low	S	R	M 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	NA
b. Refueling Water Tank - Low	NA	R	M 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	M 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	M Q	1, 2, 3
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	NA	R	M Q	1, 2, 3
8. CVCS ISOLATION				
West Penetration Room/Letdown Heat Exchanger Room Pressure - High	NA	R	M Q	1, 2, 3, 4
9. AUXILIARY FEEDWATER				
a. Manual (Trip Buttons)	NA	NA	R	NA
b. Steam Generator Level - Low	S	R	M Q	1, 2, 3
c. Steam Generator ΔP - High	S	R	M 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.

* ~~Monthly tests not required on A-10 and B-10 until EDG logic circuit modifications completed. Modifications to be completed during or before Unit 1 Refueling Outage Number 10.~~

3/4.3.1 and 3/4.3.2 PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF) INSTRUMENTATION

The **OPERABILITY** of the protective and ESF instrumentation systems and bypasses ensure that 1) the associated ESF action and/or reactor trip will be initiated when the parameter monitored by each channel or combination thereof exceeds its setpoint, 2) the specified coincidence logic is maintained, 3) sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance, and 4) sufficient system functional capability is available for protective and ESF purposes from diverse parameters.

The **OPERABILITY** of these systems is required to provide the overall reliability, redundance and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the accident analyses.

The surveillance requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability.

The measurement of response time at the specified frequencies provides assurance that the protective and ESF action function associated with each channel is completed within the time limit assumed in the accident analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable.

Response time may be demonstrated by any series of sequential, overlapping or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either 1) in place, onsite or offsite test measurements or 2) utilizing replacement sensors with certified response times. The response time limits are contained in UFSAR Chapter 7, and updated in accordance with 10 CFR 50.71(e).

3/4.3.3 MONITORING INSTRUMENTATION

3/4.3.3.1 Radiation Monitoring Instrumentation

The **OPERABILITY** of the radiation monitoring channels ensures that 1) the radiation levels are continually measured in the areas served by the individual channels and 2) the alarm or automatic action is initiated when the radiation level trip setpoint is exceeded.

The quarterly frequency for the channel functional tests for these systems is based on the analyses presented in the NRC approved topical Report CEN-327, "RPS/ESFAS Extended Test Interval Evaluation," as supplemented.

ATTACHMENT (2)

UNIT 2

TECHNICAL SPECIFICATION

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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]	~~M~~ Q	1, 2
b. ΔT Power	S	D[4],R	~~M~~ Q	1
3. Reactor Coolant Flow - Low	S	R	~~M~~ Q	1, 2
4. Pressurizer Pressure - High	S	R	~~M~~ Q	1, 2
5. Containment Pressure - High	S	R	~~M~~ Q	1, 2
6. Steam Generator Pressure - Low	S	R	~~M~~ Q	1, 2
7. Steam Generator Water Level - Low	S	R	~~M~~ Q	1, 2
8. Axial Flux Offset	S	R	~~M~~ Q	1
9. a. Thermal Margin/Low Pressure	S	R	~~M~~ Q	1, 2
b. Steam Generator Pressure Difference - High	S	R	~~M~~ Q	1, 2
10. Loss of Load	NA	NA	S/U[1]	NA

TABLE 4.3-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
11. Wide Range Logarithmic Neutron Flux Monitor	S	R(5)	S/U(1)	1, 2, 3, 4, 5 and
12. Reactor Protection System Logic Matrices	NA	NA	Q M and S/U(1)	1, 2
13. Reactor Protection System Logic Matrix Relays	NA	NA	Q M and S/U(1)	1, 2
14. Reactor Trip Breakers	NA	NA	M	1, 2 and *

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	NA
b. Containment Pressure - High	S	R	M Q	1, 2, 3
c. Pressurizer Pressure - Low	S	R	M 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	NA
b. Containment Pressure - High	S	R	M 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	NA
b. Containment Pressure - High	S	R	M 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	NA
b. Steam Generator Pressure - Low	S	R	M 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	NA
b. Refueling Water Tank - Low	NA	R	M 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	M 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	M Q	1, 2, 3
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	NA	R	M Q	1, 2, 3
8. CVCS ISOLATION				
West Penetration Room/Letdown Heat Exchanger Room Pressure - High	NA	R	M Q	1, 2, 3, 4
9. AUXILIARY FEEDWATER				
a. Manual (Trip Buttons)	NA	NA	R	NA
b. Steam Generator Level - Low	S	R	M Q	1, 2, 3
c. Steam Generator ΔP - High	S	R	M 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.

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(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.

~~* Monthly tests not required on A-10 and B-10 until EDG logic circuit modifications completed. Modifications to be completed during or before Unit 2 Refueling Outage Number 9.~~

3/4.3.1 and 3/4.3.2 PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF) INSTRUMENTATION

The **OPERABILITY** of the protective and ESF instrumentation systems and bypasses ensure that 1) the associated ESF action and/or reactor trip will be initiated when the parameter monitored by each channel or combination thereof exceeds its setpoint, 2) the specified coincidence logic is maintained, 3) sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance, and 4) sufficient system functional capability is available for protective and ESF purposes from diverse parameters.

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