

### 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.

Refueling Interval

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.

Refueling Interval

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.

Refueling Intervals

9506090159 950606  
PDR ADOCK 05000317  
P PDR

\* Neutron detectors are exempt from response time testing.

TABLE 4.3-1  
REACTOR PROTECTIVE 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 <sup>(1)</sup>	NA
2. Power Level - High				
a. Nuclear Power	S	D <sup>(2)</sup> , M <sup>(3)</sup> , Q <sup>(5)</sup>	Q	1, 2
b. $\Delta T$ Power	S	D <sup>(4)</sup> , <del>R</del> Refueling Interval	Q	1
3. Reactor Coolant Flow - Low	S	<del>R</del> Refueling Interval	Q	1, 2
4. Pressurizer Pressure - High	S	<del>R</del> Refueling Interval	Q	1, 2
5. Containment Pressure - High	S	<del>R</del> Refueling Interval	Q	1, 2
6. Steam Generator Pressure - Low	S	<del>R</del> Refueling Interval	Q	1, 2
7. Steam Generator Water Level - Low	S	<del>R</del> Refueling Interval	Q	1, 2
8. Axial Flux Offset	S	<del>R</del> Refueling Interval	Q	1
9. a. Thermal Margin/Low Pressure	S	<del>R</del> Refueling Interval	Q	1, 2
b. Steam Generator Pressure Difference - High	S	<del>R</del> Refueling Interval	Q	1, 2
10. Loss of Load	NA	NA	S/U <sup>(1)</sup>	NA

TABLE 4.3-1 (Continued)

REACTOR PROTECTIVE 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>
11. Wide Range Logarithmic Neutron Flux Monitor	S	R <sup>(5)</sup> Refueling Internal	S/U <sup>(1)</sup>	1, 2, 3, 4, 5 and
12. Reactor Protection System Logic Matrices	NA	NA	Q and S/U <sup>(1)</sup>	1, 2
13. Reactor Protection System Logic Matrix Relays	NA	NA	Q and S/U <sup>(1)</sup>	1, 2
14. Reactor Trip Breakers	NA	NA	M	1, 2 and *

### 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.

Refueling Interval

Refueling Interval

Refueling Intervals

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION 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. SAFETY INJECTION (SIAS)				
a. Manual (Trip buttons)	NA	NA	<del>R</del> Refueling Interval	NA
b. Containment Pressure - High	S	<del>R</del> Refueling Interval	Q	1, 2, 3
c. Pressurizer Pressure - Low	S	<del>R</del> Refueling Interval	Q	1, 2, 3
d. Automatic Actuation Logic	NA	NA Interval	M(1)(2)(3)	1, 2, 3
2. CONTAINMENT SPRAY (CSAS)				
a. Manual (Trip buttons)	NA	NA	<del>R</del> Refueling Interval	NA
b. Containment Pressure - High	S	<del>R</del> Refueling Interval	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA	M(1)(6)	1, 2, 3
3. CONTAINMENT ISOLATION (CIS) <sup>f</sup>				
a. Manual CIS (Trip buttons)	NA	NA	<del>R</del> Refueling Interval	NA
b. Containment Pressure - High	S	<del>R</del> Refueling Interval	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA Interval	M(1)(4)	1, 2, 3

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION 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>
4. MAIN STEAM LINE ISOLATION (SGIS)				
a. Manual SGIS (MSIV Hand Switches and Feed Head Isolation Hand Switches)	NA	NA	<del>R</del> Refueling Interval	NA
b. Steam Generator Pressure - Low	S	<del>R</del> Refueling Interval	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	<del>R</del> Refueling Interval	NA
b. Refueling Water Tank - Low	NA	<del>R</del> Refueling Interval	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	<del>R</del> Refueling Interval	NA
b. Containment Radiation - High Area Monitor	S	<del>R</del> Refueling Interval	Q	6**

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION 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>
7. LOSS OF POWER				
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	NA	<del>R</del> Refueling Interval	Q	1, 2, 3
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	NA	<del>R</del> Refueling Interval	Q	1, 2, 3
8. CVCS ISOLATION				
West Penetration Room/Letdown Heat Exchanger Room Pressure - High	NA	<del>R</del> Refueling Interval	Q	1, 2, 3, 4
9. AUXILIARY FEEDWATER				
a. Manual (Trip Buttons)	NA	NA	<del>R</del> Refueling Interval	NA
b. Steam Generator Level - Low	S	<del>R</del> Refueling Interval	Q	1, 2, 3
c. Steam Generator $\Delta P$ - High	S	<del>R</del> Refueling Interval	Q	1, 2, 3
d. Automatic Actuation Logic	NA	NA	M <sup>(1)</sup>	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) *Refueling Interval*  
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) *Refueling Interval*  
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) *Refueling Interval*  
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) *Refueling Interval*  
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.



TABLE 4.3-3

RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

3/4.3 INSTRUMENTATION

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
1. AREA MONITORS				
a. Containment				
i. Purge & Exhaust Isolation	S	<del>R</del> Refueling Interval	M	6
b. Containment Area High Range	S	<del>R</del> Refueling Interval	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

### 3/4.3 INSTRUMENTATION

TABLE 4.3-6

REMOTE SHUTDOWN MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

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

TABLE 4.3-10

POST-ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

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

### 3/4.4 REACTOR COOLANT SYSTEM

#### SURVEILLANCE REQUIREMENTS

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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**. *Retraveling Interval*

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.

### 3/4.4 REACTOR COOLANT SYSTEM

#### SURVEILLANCE REQUIREMENTS

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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:~~  
Refueling Interval

### 3/4.4 REACTOR COOLANT SYSTEM

#### 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~~ *Refueling Interval*.
- 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.

\* 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.

**ATTACHMENT (2)**

**UNIT 2 TECHNICAL SPECIFICATION**

**MARKED-UP PAGES**



### 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.

Refueling Interval

Refueling Interval

Refueling Intervals

\* Neutron detectors are exempt from response time testing.

TABLE 4.3-1

REACTOR PROTECTIVE 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 <sup>(1)</sup>	NA
2. Power Level - High				
a. Nuclear Power	S	D <sup>(2)</sup> , M <sup>(3)</sup> , Q <sup>(5)</sup>	Q	1, 2
b. $\Delta T$ Power	S	D <sup>(4)</sup> , <del>R</del> Refueling Interval	Q	1
3. Reactor Coolant Flow - Low	S	<del>R</del> Refueling Interval	Q	1, 2
4. Pressurizer Pressure - High	S	<del>R</del> Refueling Interval	Q	1, 2
5. Containment Pressure - High	S	<del>R</del> Refueling Interval	Q	1, 2
6. Steam Generator Pressure - Low	S	<del>R</del> Refueling Interval	Q	1, 2
7. Steam Generator Water Level - Low	S	<del>R</del> Refueling Interval	Q	1, 2
8. Axial Flux Offset	S	<del>R</del> Refueling Interval	Q	1
9. a. Thermal Margin/Low Pressure	S	<del>R</del> Refueling Interval	Q	1, 2
b. Steam Generator Pressure Difference - High	S	<del>R</del> Refueling Interval	Q	1, 2
10. Loss of Load	NA	NA	S/U <sup>(1)</sup>	NA

TABLE 4.3-1 (Continued)

REACTOR PROTECTIVE 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>
11. Wide Range Logarithmic Neutron Flux Monitor	S	<del>R</del> <sup>(5)</sup> Refueling Interval	S/U <sup>(1)</sup>	1, 2, 3, 4, 5 and
12. Reactor Protection System Logic Matrices	NA	NA	Q and S/U <sup>(1)</sup>	1, 2
13. Reactor Protection System Logic Matrix Relays	NA	NA	Q and S/U <sup>(1)</sup>	1, 2
14. Reactor Trip Breakers	NA	NA	M	1, 2 and *

### 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.

Refueling Interval

Refueling Interval

Refueling Intervals

TABLE 4.3-2

ENGINEERED SAFETY FEATURE ACTUATION 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. SAFETY INJECTION (SIAS)				
a. Manual (Trip buttons)	NA	NA	<del>R</del> Refueling Interval	NA
b. Containment Pressure - High	S	<del>R</del> Refueling Interval	Q	1, 2, 3
c. Pressurizer Pressure - Low	S	<del>R</del> Refueling Interval	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	<del>R</del> Refueling Interval	NA
b. Containment Pressure - High	S	<del>R</del> Refueling Interval	Q	1, 2, 3
c. Automatic Actuation Logic	NA	NA	M(1)(6)	1, 2, 3
3. CONTAINMENT ISOLATION (CIS) <sup>#</sup>				
a. Manual CIS (Trip buttons)	NA	NA	<del>R</del> Refueling Interval	NA
b. Containment Pressure - High	S	<del>R</del> Refueling Interval	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

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



TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

3/4.3 INSTRUMENTATION

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

TABLE 4.3-3

## RADIATION MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
1. AREA MONITORS				
a. Containment				
i. Purge & Exhaust Isolation	S	<del>R</del> Refueling Interval	M	6
b. Containment Area High Range	S	<del>R</del> Refueling Interval	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

3/4.3 INSTRUMENTATION

CALVERT CLIFFS - UNIT 2

3/4 3-26

Amendment No. 161

### 3/4.3 INSTRUMENTATION

TABLE 4.3-6

#### REMOTE SHUTDOWN MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>
1. Wide Range Neutron Flux	P <sub>i</sub>	NA
2. Reactor Trip Breaker Indication	M	NA
3. Reactor Coolant Cold Leg Temperature	M	<del>R</del> Refueling Interval
4. Pressurizer Pressure	M	<del>R</del> Refueling Interval
5. Pressurizer Level	M	<del>R</del> Refueling Interval
6. Steam Generator Level	M	<del>R</del> Refueling Interval
7. Steam Generator Pressure	M	<del>R</del> Refueling Interval

TABLE 4.3-10

## POST-ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

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

### 3/4.4 REACTOR COOLANT SYSTEM

#### 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**. *Refueling Interval*

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.

### 3/4.4 REACTOR COOLANT SYSTEM

#### 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~~.  
Refueling Interval



### 3/4.4 REACTOR COOLANT SYSTEM

#### 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~~  
Refueling Interval.
- 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.

\* 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.



# ATTACHMENT (3)

## INDEX

SECTION	PAGE #
DESCRIPTION .....	1
BACKGROUND .....	2
A. RPS Instruments (Technical Specification Table 4.3-1) .....	2
1. Power Level - High, $\Delta T$ Power (Table Item 2.b) .....	2
2. Reactor Coolant Flow - Low (Table Item 3) .....	2
3. Pressurizer Pressure - High (Table Item 4) .....	3
4. Containment Pressure - High (Table Item 5) .....	3
5. Steam Generator Pressure - Low (Table Item 6) .....	3
6. Steam Generator Water Level - Low (Table Item 7) .....	3
7. Axial Flux Offset (Table Item 8) .....	3
8. TM/LP (Table Item 9.a) .....	3
9. Steam Generator Pressure Difference - High (ASGT Protection Trip Function) (Table Item 9.b) .....	4
10. Wide Range Logarithmic Neutron Flux Monitor Signal Rate of Change of Power - High (Table Item 11) .....	4
B. RPS Instrument Total Bypass Functions (Technical Specification 4.3.1.1.2) .....	4
1. Zero Power Mode Bypass for Reactor Coolant Flow - Low, TM/LP and Steam Generator Differential Pressure Trips .....	4
2. Low Steam Generator Pressure Trip Bypass .....	4
3. Axial Flux Tilt Trip Bypass .....	5
4. Wide Range Logarithmic Neutron Flux Monitor Signal Rate of Change of Power - High .....	5
C. RPS Reactor Trip Response (Technical Specification 4.3.1.1.3) .....	5
D. ESFAS Instruments (Technical Specification Table 4.3-2) .....	5
1. SIAS (Table Item 1.b and .c, Table Notation Item 2 and 3) .....	5
2. CSAS (Table Item 2.b, Table Notation Item 6) .....	5
3. CIS (Table Item 3.b, Table Notation Item 4) .....	6
4. Main Steam Line Isolation (Table Item 4.b, Table Notation Item 5) .....	6
5. RAS (Table Item 5.b) .....	6
6. Containment Purge Valve Isolation Signal (CRS) (Table Item 6.b) .....	6

# ATTACHMENT (3)

## INDEX

SECTION	PAGE #
7. Loss Of Power - 4.16 kV Bus Undervoltage Signal (Table Item 7.a and .b).....	6
8. CVCIS (Table Item 8).....	7
9. AFW (Table Item 9.b and .c).....	7
E. ESFAS Manual Trip Buttons (Technical Specification Table 4.3-2, Items 1a, 2a, 3a, 4a, 5a, 6a, and 9a).....	7
F. ESFAS Instrument Total Bypass Functions (Technical Specification 4.3.2.1.2).....	7
1. SIAS Block, Pressurizer Pressure - Low.....	7
2. SGIS Block, Steam Generator Pressure - Low.....	8
G. Engineered Safety Features Response Time (Technical Specification 4.3.2.1.3).....	8
H. PORVs (Technical Specification 4.4.3.1.b).....	8
I. Low Temperature Overpressure System (Technical Specification 4.4.9.3.1.b).....	8
J. Remote Shutdown Panel Indication (Technical Specification Table 4.3-6).....	8
1. Reactor Coolant Cold Leg Temperature (Wide Range) (Table Item 3).....	8
2. Pressurizer Pressure (Wide Range) (Table Item 4).....	9
3. Pressurizer Level (Table Item 5).....	9
4. Steam Generator Level (Wide Range) (Table Item 6).....	9
5. Steam Generator Pressure (Table Item 7).....	9
K. PAM System (Technical Specification Table 4.3-10).....	9
1. Containment Pressure (Table Item 1).....	9
2. Reactor Coolant Outlet Temperature (Wide Range) (Table Item 3).....	9
3. Pressurizer Pressure (Wide Range) (Table Item 4).....	9
4. Pressurizer Level (Wide Range) (Table Item 5).....	9
5. Steam Generator Pressure (Table Item 6).....	10
6. Steam Generator Level (Wide Range) (Table Item 7).....	10
7. AFW Flow Rate (Table Item 8).....	10
8. RCS Subcooled Margin Monitor (Table Item 9).....	10
9. PORV/Safety Valve Acoustic Monitors (Table Item 10).....	10
10. Feedwater Flow (Table Item 12).....	10
11. Containment Water Level (Wide Range) (Table Item 13).....	10
L. Containment Sump Level Alarm System (Technical Specification 4.4.6.1.b).....	10

## ATTACHMENT (3)

### INDEX

SECTION	PAGE #
M. Radiation Monitoring Instrumentation (Technical Specification Table 4.3-3.1) .....	11
1. Containment Purge and Exhaust Isolation Radiation Monitoring System .....	11
(Table Item 1.a)	
2. Containment Area High Range Radiation Monitoring System (Table Item 1.b) .....	11
REQUESTED CHANGE .....	11
SAFETY ANALYSIS .....	11
A. GL 91-04 Issues .....	12
B. Generic Safety Analysis Issues .....	13
1. Rosemount Transmitters .....	13
2. WEED Resistance Temperature Detectors .....	13
3. Channel Functional Testing .....	13
4. Safe Plant Shutdown .....	13
5. Instrument Performance Monitoring .....	14
6. Setpoints .....	14
7. Drift Analysis, Instrument Uncertainty and Setpoint Methodology .....	14
8. Time Response Testing .....	15
9. Nuclear Instrument Calibration .....	15
10. Effect on Plant Safety .....	15
C. RPS, ESFAS, PORVs and LTOP Instruments .....	15
1. Generic RPS, ESFAS, PORVs and LTOP Instruments Discussion .....	16
2. RPS Wide Range Logarithmic Neutron Flux Monitor Trip (Table 4.3-1, Item 11) .....	18
3. ESFAS (RWT Level - Low) RAS .....	18
4. ESFAS (Containment Purge Valve Isolation) CRS .....	18
5. ESFAS (4.16 kV Bus Undervoltage) EDG Diesel Generator Start .....	19
6. RPS Total Bypass Logic Functions .....	19
7. RPS Time Response Testing .....	20
8. ESFAS Automatic Actuation Logic Circuitry .....	20
9. ESFAS Total Bypass Logic Functions .....	20
10. ESFAS Time Response Testing .....	20
11. ESFAS Manual Trip Push Buttons and Handswitches .....	20
D. Remote Shutdown Instrumentation .....	21

## ATTACHMENT (3)

### INDEX

SECTION	PAGE #
E. PAM Instrumentation .....	22
1. Primary PAM Instrument Functions Sections Evaluated .....	22
2. Acoustic Valve Monitor .....	23
3. Main Feedwater Flow.....	23
F. Radiation Monitoring Instrumentation.....	23
1. Containment Purge and Exhaust Isolation Radiation Monitoring System .....	23
2. Containment Area High Radiation Monitoring System .....	23
G. Containment Sump Level Alarm System .....	24
H. Conclusion .....	24
 DETERMINATION OF SIGNIFICANT HAZARDS.....	 24
 ENVIRONMENTAL ASSESSMENT .....	 26
 SCHEDULE.....	 27
 SAFETY COMMITTEE REVIEW .....	 28