UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-317

CALVERT CLIFFS NUCLEAR POWER PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 184
License No. DPR-53

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Baltimore Gas and Electric Company (the licensee) dated November 11, 1993, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-53 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 184, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Capra

Robert A. Capra, Director
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 10, 1994

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

BALTIMORE GAS AND ELECTRIC COMPANY

DOCKET NO. 50-318

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 161
License No. DPR-69

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Baltimore Gas and Electric Company (the licensee) dated November 11, 1993, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.2 of Facility Operating License No. DPR-69 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 164, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert A. Capra, Director
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 10, 1994

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 184 FACILITY OPERATING LICENSE NO. DPR-53

AMENDMENT NO. 161 FACILITY OPERATING LICENSE NO. DPR-69

DOCKET NOS. 50-317 AND 50-318

Revise Appendix A as follows:

Remove Pages	Insert Pages
IV	IV
3/4 3-1	3/4 3-1
3/4 3-6 through 3-8*	3/4 3-6 through 3-8*
3/4 3-9	3/4 3-9
3/4 3-10 through -61* (DPR-53)	3/4 3-10 through -61* (DPR-53)
3/4 3-10 through -60* (DPR-69)	3/4 3-10 through -60* (DRP-69)
B3/4 3-1	B3/4 3-1

*Rollover pages vertical line at page number only.

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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.

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* 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)	M	1, 2
b. ΔT Power	S	D(4),R	M	1
3. Reactor Coolant Flow - Low	S	R	M	1, 2
4. Pressurizer Pressure - High	S	R	M	1, 2
5. Containment Pressure - High	S	R	M	1, 2
6. Steam Generator Pressure - Low	S	R	M	1, 2
7. Steam Generator Water Level - Low	S	R	M	1, 2
8. Axial Flux Offset	S	R	M	1
9. a. Thermal Margin/Low Pressure	S	R	M	1, 2
b. Steam Generator Pressure Difference - High	S	R	M	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	M and S/U(1)	1, 2
13. Reactor Protection System Logic Matrix Relays	NA	NA	M and S/U(1)	1, 2
14. Reactor Trip Breakers	NA	NA	M	1, 2 and *

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 $\leq$ 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**.

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.

TABLE 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. SAFETY INJECTION (SIAS)#					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	6
b. Containment Pressure - High	4	2	3	1, 2, 3	7*
c. Pressurizer Pressure - Low	4	2	3	1, 2, 3(a)	7*
2. CONTAINMENT SPRAY (CSAS)					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	6
b. Containment Pressure - High	4	2	3	1, 2, 3	11
3. CONTAINMENT ISOLATION (CIS)#					
a. Manual CIS (Trip Buttons)	2	1	2	1, 2, 3, 4	6
b. Containment Pressure - High	4	2	3	1, 2, 3	7*

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
4. MAIN STEAM LINE ISOLATION					
a. Manual (MSIV Hand Switches and Feed Head Isolation Hand Switches)	1/valve	1/valve	1/valve	1, 2, 3, 4	6
b. Steam Generator Pressure - Low	4/steam generator	2/steam generator	3/steam generator	1, 2, 3[(c)]	7*
5. CONTAINMENT SUMP RECIRCULATION (RAS)					
a. Manual RAS (Trip Buttons)	2	1	2	1, 2, 3, 4	6
b. Refueling Water Tank - Low	4	2	3	1, 2, 3	7*

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
6. CONTAINMENT PURGE VALVES ISOLATION					
a. Manual (Purge Valve Control Switches)	2/Penetration	1/Penetration	2/Penetration	6**	8
b. Containment Radiation - High Area Monitor	4	2	3	6**	8
7. LOSS OF POWER					
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	4/Bus	2/Bus	3/Bus	1, 2, 3	7*
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	4/Bus	2/Bus	3/Bus	1, 2, 3	7*

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
8. CVCS ISOLATION					
a. Manual (CVCS Isolation Valve Control Switches)	1/Valve	1/Valve	1/Valve	1,2,3,4	6
b. West Penetration Room/Letdown Heat Exchanger Room Pressure - High	4	2	3	1,2,3,4	7*
9. AUXILIARY FEEDWATER ACTUATION SYSTEM (AFAS)					
a. Manual (Trip Buttons)	2 sets of 2 per S/G	1 set of 2 per S/G	2 sets of 2 per S/G	1, 2, 3	6
b. Steam Generator Level - Low	4/SG	2/SG	3/SG	1, 2, 3	7
c. Steam Generator ΔP High	4/SG	2/SG	3/SG	1, 2, 3	7

TABLE 3.3-3 (Continued)

TABLE NOTATION

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

@ When the RCS temperature is:

(a) Greater than 375°F, the required **OPERABLE** HPSI pumps must be able to start automatically upon receipt of a SIAS signal,

(b) Between 375°F and 355°F, a transition region exists where the **OPERABLE** HPSI pump will be placed in pull-to-lock on a cooldown and restored to automatic status on a heatup.

(c) At 355°F and less, the required **OPERABLE** HPSI pump shall be in pull-to-lock and will not start automatically.

* The provisions of Specification 3.0.4 are not applicable.

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

(a) Trip function may be bypassed in this **MODE** when pressurizer pressure is < 1800 psia; bypass shall be automatically removed when pressurizer pressure is ≥ 1800 psia.

(c) Trip function may be bypassed in this **MODE** below 785 psia; bypass shall be automatically removed at or above 785 psia.

TABLE 3.3-3 (Continued)

ACTION STATEMENTS

ACTION 6 - With the number of **OPERABLE** channels one less than the Total Number of Channels, restore the inoperable channel to **OPERABLE** status within 48 hours or be in at least **HOT STANDBY** within the next 6 hours and in **COLD SHUTDOWN** within the following 30 hours.

ACTION 7 - With the number of **OPERABLE** channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. For the purposes of testing and maintenance, the inoperable channel may be bypassed for up to 48 hours from time of initial loss of **OPERABILITY**; however, the inoperable channel shall then be either restored to **OPERABLE** status or placed in the tripped condition.

b. Within one hour, all functional units receiving an input from the inoperable channel are also placed in the same condition (either bypassed or tripped, as applicable) as that required by a. above for the inoperable channel.

c. The Minimum Channels **OPERABLE** requirement is met; however, one additional channel may be bypassed for up to 48 hours while performing tests and maintenance on that channel provided the other inoperable channel is placed in the tripped condition.

ACTION 8 - With less than the Minimum Channels **OPERABLE**, operation may continue provided the containment purge valves are maintained closed.

ACTION 11 - With the number of **OPERABLE** Channels one less than the Total Number of Channels, operation may proceed provided the inoperable channel is placed in the bypassed condition and the Minimum Channels **OPERABLE** requirement is demonstrated within 1 hour; one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.

TABLE 3.3-4

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
1. SAFETY INJECTION (SIAS)		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Containment Pressure - High	≤ 4.75 psig	≤ 4.75 psig
c. Pressurizer Pressure - Low	≥ 1725 psia	≥ 1725 psia
2. CONTAINMENT SPRAY (CSAS)		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Containment Pressure - High	≤ 4.75 psig	≤ 4.75 psig
3. CONTAINMENT ISOLATION (CIS)#		
a. Manual CIS (Trip Buttons)	Not Applicable	Not Applicable
b. Containment Pressure - High	≤ 4.75 psig	≤ 4.75 psig
4. MAIN STEAM LINE ISOLATION		
a. Manual (MSIV Hand Switches and Feed Head Isolation Hand Switches)	Not Applicable	Not Applicable
b. Steam Generator Pressure - Low	≥ 685 psia	≥ 685 psia

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

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
5. CONTAINMENT SUMP RECIRCULATION (RAS)		
a. Manual RAS (Trip Buttons)	Not Applicable	Not Applicable
b. Refueling Water Tank - Low	$\geq$ 24 inches above tank bottom	$\geq$ 24 inches above tank bottom
6. CONTAINMENT PURGE VALVES ISOLATION		
a. Manual (PURGE Valve Control Switches)	Not Applicable	Not Applicable
b. Containment Radiation - High Area Monitor	$\leq$ 220 mr/hr	$\leq$ 220 mr/hr
7. LOSS OF POWER		
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	2450 $\pm$ 105 volts with a 2 $\pm$ 0.2 second time delay	2450 $\pm$ 105 volts with a 2 $\pm$ 0.2 second time delay
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	3628 $\pm$ 25 volts with a 8 $\pm$ 0.4 second time delay	3628 $\pm$ 25 volts with a 8 $\pm$ 0.4 second time delay

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
8. CVCS ISOLATION		
West Penetration Room/Letdown Heat Exchanger Room Pressure - High	≤ 0.5 psig	≤ 0.5 psig
9. AUXILIARY FEEDWATER ACTUATION SYSTEM (AFAS)		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Steam Generator (A or B) Level - Low	-149 inches to -194 inches (inclusive)	-149 inches to -194 inches (inclusive)
c. Steam Generator ΔP - High (SG-A > SG-B)	≤ 135.0 psi	≤ 135.0 psi
d. Steam Generator ΔP - High (SG-B > SG-A)	≤ 135.0 psi	≤ 135.0 psi

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

3/4.3.3 MONITORING INSTRUMENTATION

Radiation Monitoring Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.1 The radiation monitoring instrumentation channels shown in Table 3.3-6 shall be **OPERABLE** with their alarm/trip setpoints within the specified limits.

APPLICABILITY: As shown in Table 3.3-6.

ACTION:

a. With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.

b. With one or more radiation monitoring channels inoperable, take the **ACTION** shown in Table 3.3-6.

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.1 Each radiation monitoring 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 4.3-3.

TABLE 3.3-6

RADIATION MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	MEASUREMENT RANGE	ACTION
1. AREA MONITORS					
a. Containment					
i. Purge & Exhaust Isolation	3	6	$\leq$ 220 mr/hr	10^{-1} - 10^{4} mr/hr	16
b. Containment Area High Range	2	1, 2, 3, & 4	$\leq$ 10 R/hr	1 - 10^{8} R/hr	30
2. PROCESS MONITORS					
a. Containment					
i. Gaseous Activity					
a) RCS Leakage Detection	1	1, 2, 3, & 4	Not Applicable	10^{1} - 10^{6} cpm	14
ii. Particulate Activity					
a) RCS Leakage Detection	1	1, 2, 3, & 4	Not Applicable	10^{1} - 10^{6} cpm	14
b. Noble Gas Effluent Monitors					
i. Main Vent Wide Range	1	1, 2, 3, & 4	*	10^{-7} to 10^{5} µCi/cc	30
ii. Main Steam Header	2	1, 2, 3, & 4	*	10^{-2} to 10^{5} R/hr	30

TABLE 3.3-6 (Continued)

TABLE NOTATION

* Alarm setpoint to be specified in a controlled document (e.g., setpoint control manual).

ACTION STATEMENTS

ACTION 14 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, comply with the **ACTION** requirements of Specification 3.4.6.1.

ACTION 16 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, comply with the **ACTION** requirements of Specification 3.9.9.

ACTION 30 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, initiate the preplanned alternate method of monitoring the appropriate parameter(s), within 72 hours, and:

1) either restore the inoperable channel(s) to **OPERABLE** status within 7 days of the event, or

2) prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event, outlining the action taken, the cause of the inoperability, and the plans and schedule for restoring the system to **OPERABLE** status.

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

3/4.3 **INSTRUMENTATION**

3/4.3.3 MONITORING INSTRUMENTATION

Incore Detectors

LIMITING CONDITION FOR OPERATION

3.3.3.2 The Incore Detection System shall be **OPERABLE** with at least one **OPERABLE** detector segment in each core quadrant on each of the four axial elevations containing incore detectors and as further specified below:

a. For monitoring the **AZIMUTHAL POWER TILT**:*

At least two quadrant symmetric incore detector segment groups at each of the four axial elevations containing incore detectors in the outer 184 fuel assemblies with sufficient **OPERABLE** detector segments in these detector groups to compute at least two **AZIMUTHAL POWER TILT** values at each of the four axial elevations containing incore detectors.

b. For recalibration of the Excore Neutron Flux Detector System:

1. At least 75%** of all incore detector segments,

2. A minimum of 9 **OPERABLE** incore detector segments at each detector segment level, and

3. A minimum of 2 **OPERABLE** detector segments in the inner 109 fuel assemblies and 2 **OPERABLE** segments in the outer 108 fuel assemblies at each segment level.

c. For monitoring the **UNRODDED PLANAR RADIAL PEAKING FACTOR**, the **UNRODDED INTEGRATED RADIAL PEAKING FACTOR**, or the linear heat rate:

---

* For Unit 1 Cycle 11 only, the following requirements shall be substituted for Limiting Condition for Operation 3.3.3.2.a:

At least eight quadrant symmetric incore detector segment groups containing incore detectors in the outer 184 fuel assemblies with sufficient **OPERABLE** detector segments in these detector groups to compute at least one **AZIMUTHAL POWER TILT** value at each of the four axial elevations containing incore detectors and at least two **AZIMUTHAL POWER TILT** values at three axial elevations containing incore detectors.

** For Unit 1 Cycle 11 only, the following requirement shall be substituted for Limiting Condition for Operation 3.3.3.2.b.1:

At least 60% of all incore detector segments,

LIMITING CONDITION FOR OPERATION (Continued)

1. At least 75%*** of all incore detector locations,

2. A minimum of 9 **OPERABLE** incore detector segments at each detector segment level, and

3. A minimum of 2 **OPERABLE** detector segments in the inner 109 fuel assemblies and 2 **OPERABLE** segments in the outer 108 fuel assemblies at each segment level. An **OPERABLE** incore detector segment shall consist of an **OPERABLE** rhodium detector constituting one of the segments in a fixed detector string.An **OPERABLE** incore detector location shall consist of a string in which at least three of the four incore detector segments are **OPERABLE**.

An **OPERABLE** quadrant symmetric incore detector segment group shall consist of a minimum of three **OPERABLE** rhodium incore detector segments in 90° symmetric fuel assemblies.

APPLICABILITY: When the Incore Detection System is used for:

a. Monitoring the **AZIMUTHAL POWER TILT**,

b. Recalibration of the Excore Neutron Flux Detection System, or

c. Monitoring the **UNRODDED PLANAR RADIAL PEAKING FACTOR**, the **UNRODDED INTEGRATED RADIAL PEAKING FACTOR**, or the linear heat rate.

ACTION: With the Incore Detection System inoperable, do not use the system for the above applicable monitoring or calibration functions. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

*** For Unit 1 Cycle 11 only, the following requirement shall be substituted for Limiting Condition for Operation 3.3.3.2.c.1:

At least 60% of all incore detector locations,

SURVEILLANCE REQUIREMENTS

4.3.3.2 The Incore Detection System shall be demonstrated **OPERABLE**:

a. By performance of a **CHANNEL CHECK** within 24 hours prior to its use and at least once per 7 days thereafter when required for:

1. Monitoring the **AZIMUTHAL POWER TILT**.

2. Recalibration of the Excore Neutron Flux Detection System.

3. Monitoring the **UNRODDED PLANAR RADIAL PEAKING FACTOR**, the **UNRODDED INTEGRATED RADIAL PEAKING FACTOR**, or the linear heat rate.

b. At least once per **REFUELING INTERVAL** by performance of a **CHANNEL CALIBRATION** operation which exempts the neutron detectors but includes all electronic components. The neutron detectors shall be calibrated prior to installation in the reactor core.

3/4.3 **INSTRUMENTATION**

3/4.3.3 MONITORING INSTRUMENTATION

Seismic Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.3 The seismic monitoring instrumentation shown in Table 3.3-7 shall be **OPERABLE**.

APPLICABILITY: At all times.

ACTION:

a. With one or more seismic monitoring instruments inoperable for more than 30 days, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 10 days outlining the cause of the malfunction and the plans for restoring the instrument(s) to **OPERABLE** status.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.3.1 Each of the above seismic monitoring instruments shall be demonstrated **OPERABLE** by the performance of the **CHANNEL CHECK, CHANNEL CALIBRATION** and **CHANNEL FUNCTIONAL TEST** operations at the frequencies shown in Table 4.3-4.

4.3.3.3.2 Each of the above seismic monitoring instruments actuated during a seismic event shall be restored to **OPERABLE** status within 24 hours and a **CHANNEL CALIBRATION** performed within 5 days following the seismic event. Data shall be retrieved from actuated instruments and analyzed to determine the magnitude of the vibratory ground motion. A Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 10 days describing the magnitude, frequency spectrum and resultant effect upon facility features important to safety.

TABLE 3.3-7

SEISMIC MONITORING INSTRUMENTATION

INSTRUMENTS AND SENSOR LOCATIONS	MEASUREMENT RANGE	MINIMUM INSTRUMENT OPERABLE
1. Triaxial Time-History Strong Motion Accelographs		
a. O-YE-001 Unit 1 Containment Base	0-1g	1
b. O-YE-002 Unit 1 Containment 69'	0-1g	1
c. O-YE-003 Auxiliary Bldg. Base	0-1g	1
d. O-YE-004 Intake Structure	0-1g	1
e. O-YE-005 Free Field	0-1g	1
2. Triaxial Seismic Switches		
a. O-YS-001 Unit 1 Containment Base	NA	1
b. O-YS-002 Unit 1 Containment 69'	NA	1
3. Seismic Acceleration Recorder		
a. O-YRC-001 Control Room	NA	1
b. O-YR-001 Control Room	NA	1

TABLE 4.3-4

SEISMIC MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENTS AND SENSOR LOCATIONS	CHANNEL CHECK**	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST
1. Triaxial Time-History Strong Motion Accelographs			
a. O-YE-001 Unit 1 Containment Base	M*	R	SA
b. O-YE-002 Unit 1 Containment 69'	M*	R	SA
c. O-YE-003 Auxiliary Bldg. Base	M*	R	SA
d. O-YE-004 Intake Structure	M*	R	SA
e. O-YE-005 Free Field	M*	R	SA
2. Triaxial Seismic Switches			
a. O-YS-001 Unit 1 Containment Base	M	R	SA
b. O-YS-002 Unit 1 Containment 69'	M	R	SA
3. Seismic Acceleration Recorder			
a. O-YRC-001 Control Room	M	R	SA
b. O-YR-001 Control Room	M	R	SA

** Verify instrument energized.

* Except seismic trigger.

3/4.3 **INSTRUMENTATION**

3/4.3.3 MONITORING INSTRUMENTATION

Meteorological Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.4 The meteorological monitoring instrumentation channels shown in Table 3.3-8 shall be **OPERABLE**.

APPLICABILITY: At all times.

ACTION:

a. With one or more required meteorological monitoring channels inoperable for more than 7 days, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 10 days outlining the cause of the malfunction and the plans for restoring the channel(s) to **OPERABLE** status.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.4 Each of the above meteorological monitoring instrumentation channels shall be demonstrated **OPERABLE** by the performance of the **CHANNEL CHECK** and **CHANNEL CALIBRATION** operations at the frequencies shown in Table 4.3-5.

TABLE 3.3-8

METEOROLOGICAL MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE
1. WIND SPEED	
a. Nominal Elev. 10M	1
b. Nominal Elev. 60M	1
2. WIND DIRECTION	
a. Nominal Elev. 10M	1
b. Nominal Elev. 60M	1
3. AIR TEMPERATURE - DELTA T (10M-60M)	1

TABLE 4.3-5

METEOROLOGICAL MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION
1. WIND SPEED		
a. Nominal Elev. 10M	D	SA
b. Nominal Elev. 60M	D	SA
2. WIND DIRECTION		
a. Nominal Elev. 10M	D	SA
b. Nominal Elev. 60M	D	SA
3. AIR TEMPERATURE - DELTA T (10M-60M)	D	SA

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Remote Shutdown Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.5 The remote shutdown monitoring instrumentation channels shown in Table 3.3-9 shall be **OPERABLE** with readouts displayed external to the Control Room.

APPLICABILITY: **MODES** 1, 2 and 3.

ACTION:

a. With the number of **OPERABLE** remote shutdown monitoring channels less than required by Table 3.3-9, either restore the inoperable channel to **OPERABLE** status within 30 days, or be in **HOT SHUTDOWN** within the next 12 hours.

b. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.5 Each remote shutdown monitoring instrumentation channel shall be demonstrated **OPERABLE** by performance of the **CHANNEL CHECK** and **CHANNEL CALIBRATION** operations at the frequencies shown in Table 4.3-6.

TABLE 3.3-9

REMOTE SHUTDOWN MONITORING INSTRUMENTATION

INSTRUMENT	READOUT LOCATION	MEASUREMENT RANGE	MINIMUM CHANNELS OPERABLE
1. Wide Range Neutron Flux	1C43*	0.1 cps-200% power*	1*
2. Reactor Trip Breaker Indication	Cable Spreading Room	OPEN-CLOSE	1/trip breaker
3. Reactor Coolant Cold Leg Temperature	1C43	212-705°F	1
4. Pressurizer Pressure	1C43	0-4000 psia	1
5. Pressurizer Level	1C43	0-360 inches	1
6. Steam Generator Pressure	1C43	0-1200 psig	1/steam generator
7. Steam Generator Level	1C43	-401 to +63.5 inches	1/steam generator

* When the 1C43 instrumentation is inoperable, the wide range neutron flux monitors located in the auxiliary feedwater pump room may be utilized to meet this requirement. During the period when the instruments are utilized to meet the above requirement, they will be subject to the surveillance requirements of Table 4.3-6.

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

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Post-Accident Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.6 The post-accident monitoring instrumentation channels shown in Table 3.3-10 shall be **OPERABLE**.

APPLICABILITY: **MODES** 1, 2 and 3.

ACTION:

a. As shown in Table 3.3-10.

b. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.6 Each post-accident monitoring instrumentation channel shall be demonstrated **OPERABLE** by performance of the **CHANNEL CHECK** and **CHANNEL CALIBRATION** operations at the frequencies shown in Table 4.3-10.

TABLE 3.3-10

POST-ACCIDENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	ACTION
1. Containment Pressure	2	31
2. Wide Range Logarithmic Neutron Flux Monitor	2	31
3. Reactor Coolant Outlet Temperature	2	31
4. Pressurizer Pressure	2	31
5. Pressurizer Level	2	31
6. Steam Generator Pressure	2/steam generator	31
7. Steam Generator Level (Wide Range)	2/steam generator	31
8. Auxiliary Feedwater Flow Rate	2/steam generator	31
9. RCS Subcooled Margin Monitor	1	31
10. PORV/Safety Valve Acoustic Flow Monitoring	1/valve	31
11. PORV Solenoid Power Indication	1/valve	31
12. Feedwater Flow	2	31
13. Containment Water Level (Wide Range)	2	32, 33
14. Reactor Vessel Water Level	2*	34, 35
15. Core Exit Thermocouple System	2 locations/core quadrant	31

* A channel has eight sensors in a probe. A channel is **OPERABLE** if four or more sensors, one or more in the upper three and three or more in the lower five, are **OPERABLE**.

TABLE 3.3-10 (Continued)

ACTION STATEMENTS

ACTION 31 - With the number of **OPERABLE** post-accident monitoring channels less than required by Table 3.3-10, either restore the inoperable channel to **OPERABLE** status within 30 days or be in **HOT SHUTDOWN** within the next 12 hours.

ACTION 32 - With the number of **OPERABLE** post-accident monitoring channels one less than the Minimum Channels **OPERABLE** requirement in Table 3.3-10, operation may proceed provided the inoperable channel is restored to **OPERABLE** status at the next outage of sufficient duration.

ACTION 33 - With the number of **OPERABLE** post-accident monitoring channels two less than required by Table 3.3-10, either restore one inoperable channel to **OPERABLE** status within 30 days or be in **HOT SHUTDOWN** within the next 12 hours.

ACTION 34 - With the number of **OPERABLE** post-accident monitoring channels one less than the Minimum Channels **OPERABLE** requirement in Table 3.3-10, either restore the system to **OPERABLE** status within 7 days if repairs are feasible without shutting down or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event, outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to **OPERABLE** status.

ACTION 35 - With the number of **OPERABLE** channels two less than required by Table 3.3-10, either restore the inoperable channel(s) to **OPERABLE** status within 48 hours if repairs are feasible without shutting down or:

1. Initiate an alternate method of monitoring for core and Reactor Coolant System voiding;

2. Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event, outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to **OPERABLE** status; and

3. Restore the system to **OPERABLE** status at the next scheduled refueling.

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	NA	R
11. PORV Solenoid Power Indication	NA	NA
12. Feedwater Flow	M	R
13. Containment Water Level (Wide Range)	M	R
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.

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Fire Detection Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.7 As a minimum, the fire detection instrumentation for each fire detection zone shown in Table 3.3-11 shall be **OPERABLE**.

APPLICABILITY: Whenever equipment in that fire detection zone is required to be **OPERABLE**.

ACTION: With one or more of the fire detection instrument(s) shown in Table 3.3-11 inoperable:

a. Within 1 hour establish a fire watch patrol to inspect the zone(s) with the inoperable instrument(s) at least once per hour, unless the instrument(s) is located inside the containment, then inspect the containment at least once per 8 hours or monitor the containment air temperature at least once per hour at the locations listed in Specification 4.6.1.5; or unless the instrument(s) is located in fire detection zones equipped with automatic wet pipe sprinkler systems alarmed and supervised to the Control Room, then within 1 hour and at least per 24 hours thereafter, inspect the zone(s) with inoperable instruments and verify that the Automatic Sprinkler System, including the water flow alarm and supervisory system, is **OPERABLE** by **CHANNEL FUNCTIONAL TEST**.

b. Restore the inoperable instrument(s) to **OPERABLE** status within 14 days or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the instrument(s) to **OPERABLE** status.

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.7.1 At least once per 6 months, at least 25% of the above required fire detection instruments which are accessible during plant operation shall be demonstrated **OPERABLE** by performance of a **CHANNEL FUNCTIONAL TEST**. Detectors selected for testing shall be selected on a rotating basis such

SURVEILLANCE REQUIREMENTS (Continued)

that all detectors will be tested over a two year period. If in any detection zone there are less than four detectors, at least one different detector in that zone shall be tested every six months. For each detector found inoperable during functional testing, at least an additional 10% of all detectors or 10 detectors, whichever is less, shall also be tested. Fire detectors which are inaccessible during plant operation shall be demonstrated **OPERABLE** by the performance of a **CHANNEL FUNCTIONAL TEST** during each **COLD SHUTDOWN** exceeding 24 hours unless performed during the previous six months.

4.3.3.7.2 The NFPA Code 72D Class B supervised circuits supervision associated with the detector alarms of each of the above required fire detection instruments shall be demonstrated **OPERABLE** at least once per 6 months.

4.3.3.7.3 The non-supervised circuits, associated with detector alarms, between the instrument and the Control Room shall be demonstrated **OPERABLE** at least once per 31 days.

TABLE 3.3-11

FIRE DETECTION INSTRUMENTS
UNIT 1

ROOM/AREA AUX BLDG.	INSTRUMENT LOCATION	MINIMUM INSTRUMENTS OPERABLE*		
		HEAT	FLAME	SMOKE
100/103/ 104/116	Corridors - Elev (-)10"-0"			5
110	Coolant Waste Rec & Mon. Tk Pp Rm			2
111	Waste Processing Control Rm			1
112/114	Coolant Waste Rec Tank		4	
113	Misc. Waste Receiver Tank Room			1
115	Charging Pump Room			3
118/122	ECCS Pump Room			7
119/123	ECCS Pump Room			7
200/202	Corridors, &			
209/210	Corridors &			
212/219	Corridors			13
207/208	Waste Gas Equip Rm			3
216	Reactor Coolant Make-up Pumps			1
217	Boric Acid Tank & Pump Room			2
218	Volume Control Tank Room			1
220	Degasifier Pump Room			1
221/326	West Piping Penetration Room		2	3
222	Hot Instrument Shop			2
223	Hot Machine Shop			4
224	East Piping Area			10
225	Rad Exhaust Vent Equip Rm			4
226	Service Water Pump Rm		3	6
227/316	East Piping Penetration Rm		3	5
228	Component Cooling Pump Rm			8
301/304/300	Battery Room & Corridor			3

* Detection instruments located within the containment are not required to be **OPERABLE** during the performance of Type A Containment Leakage Rate Tests.

TABLE 3.3-11 (Continued)

FIRE DETECTION INSTRUMENTS
UNIT 1

ROOM/AREA AUX BLDG.	INSTRUMENT LOCATION	MINIMUM INSTRUMENTS OPERABLE* HEAT	FLAME	SMOKE
306/1C	Cable Spreading Rm & Cable Chase**	2		10
308	N/S Corridor			6
315	Main Steam Piping Area			6
317	Switchgear Room, Elev 27'-0"**			6
318	Purge Air Supply Room			2
319/325	West Passage and Vestibule			6
320	Spent Fuel Heat Exchanger Room			3
323	Passage 27' Valve Alley & Filter Rm			3
324	Letdown Heat Exchanger Rm			1
Elev. 27'-0"	Switchgear Vent Duct	1		
1A	Cable Chase 1A			1
1B	Cable Chase 1B			1
405	Control Room			6
410	N/S Corridor			4
417/418	Solid Waste Processing		2	3
413/419/420	Cask and Equip Loading Area &			
424/425/426	Cask and Equip Loading Area		3	22
421	Diesel Generator No. (12)**	2		
422	Diesel Generator No. (11)**	2		
423	West Electrical Pen Rm			3
428	East Piping Area			7
429	East Electrical Pen Rm			3
430	Switchgear Room Elev 45'-0"**			8
439	Refueling Water Tank Pump Rm			2
441	Spent Resin Metering Tank Rm			1
Elev 45'-0"	Switchgear Vent Duct	1		

* Detection instruments located within the containment are not required to be OPERABLE during the performance of Type A Containment Leakage Rate Tests.

** Detectors which automatically actuate Fire Suppression Systems.

TABLE 3.3-11 (Continued)

FIRE DETECTION INSTRUMENTS
UNIT 1

ROOM/AREA AUX BLDG.	INSTRUMENT LOCATION	MINIMUM INSTRUMENTS OPERABLE* HEAT	FLAME	SMOKE
Elev 69'-0"	Control Room Vent Duct "A"			1
Elev 69'-0"	Cable Spreading Room Vent Duct			1
512	Control Room HVAC Equipment			4
586/588/589/590	Radiation Chemistry Area,			
592/593	Radiation Chemistry Area,			
595/596/597	Radiation Chemistry Area,			
587	Frisker Area,			
591	Clothing Disposal, and			
523/594	Corridors			20
520	Spent Fuel Pool Area Vent Equip Rm			2
524	Main Plant Exhaust Equip Rm			8
525	Cntmt Access Area			3
529	Electrical Equip. Room			3
530/531/533	Spent Fuel Pool Area		5	17
536/537	Misc Waste Evaporator & Equip Rm			3
Elev 83'-0"	Cable Tunnel			4
603	Auxiliary Feedwater Pump Rm			2
Containment Bldg.				
U-1	RCP Bay East*	16		
U-1	RCP Bay West*	16		
U-1	East Electric Pen Area*	***		
U-1	West Electric Pen Area*	***		
Intake Structure	Elev 3'-0" Unit 1 Side			24

* Detection instruments located within the containment are not required to be OPERABLE during the performance of Type A Containment Leakage Rate Tests.

*** Monitored by four protecto wires.

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Radioactive Gaseous Effluent Monitoring Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.9 The radioactive gaseous effluent monitoring instrumentation channels shown in Table 3.3-12 shall be **OPERABLE** with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.2.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined and adjusted in accordance with the methodology and parameters in the **ODCM**.

APPLICABILITY: As shown in Table 3.3-12.

ACTION:

a. With a radioactive gaseous effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above Specification, without delay suspend the release of radioactive gaseous effluents monitored by the affected channel, or declare the channel inoperable, or change the setpoint so it is acceptably conservative.

b. With less than the minimum number of radioactive gaseous effluent monitoring instrumentation channels **OPERABLE**, take the **ACTION** shown in Table 3.3-12. Exert best efforts to return the instruments to **OPERABLE** status within 30 days and, if unsuccessful, explain in the next Semiannual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner.

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.9 Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated **OPERABLE** by performance of the **CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION** and **CHANNEL FUNCTIONAL TEST** operations at the frequencies shown in Table 4.3-11.

TABLE 3.3-12

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
1. WASTE GAS HOLDUP SYSTEM			
a. Noble Gas Activity Monitor - Providing Alarm and Automatic Termination of Release	1	*	35
b. Effluent System Flow Rate Measuring Device	1	*	36
2. MAIN VENT SYSTEM			
a. Noble Gas Activity Monitor	1	*	37
b. Iodine Sampler	1	*	38
c. Particulate Sampler	1	*	38

TABLE 3.3-12 (Continued)

TABLE NOTATION

* At all times.

ACTION STATEMENTS

ACTION 35 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, the contents of the tank(s) may be released to the environment:

a. Using the main vent monitor as a backup and recording RMS readings every 15 minutes during the release, or

b. Provided that prior to initiating the release, at least two independent samples of the tank's contents are analyzed, and at least two technically qualified members of the Facility Staff independently verify the release rate calculations and two qualified operators verify the discharge valve lineup.

Otherwise, suspend release of radioactive effluents via this pathway.

ACTION 36 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours.

ACTION 37 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, effluent releases via this pathway may continue provided either (1) grab samples are taken and analyzed for gross activity at least once per 24 hours, or (2) an equivalent monitor is provided.

ACTION 38 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, effluent releases via the affected pathway may continue provided samples are continuously collected as required in Table 4.11-2 with auxiliary sampling equipment.

TABLE 4.3-11

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
1. WASTE GAS HOLDUP SYSTEM					
a. Noble Gas Activity Monitor - Providing Alarm and Automatic Termination of Release	P	P	R(3)	SA(1)	*
b. Effluent System Flow Rate Measuring Device	D(4)	NA	R	NA	*
2. MAIN VENT SYSTEM					
a. Noble Gas Activity Monitor	D	M	R(3)	SA(2)	*
b. Iodine Sampler	W	NA	NA	NA	*
c. Particulate Sampler	W	NA	NA	NA	*

TABLE 4.3-11 (Continued)

TABLE NOTATION

* At all times other than when the line is valved out and locked.

(1) The **CHANNEL FUNCTIONAL TEST** shall also demonstrate the automatic isolation of this pathway and/or Control Room alarm annunciation occurs if the appropriate following condition(s) exists:

1. Instrument indicates measure levels above the alarm/trip setpoint.
2. Circuit failure.
3. Instrument indicates a downscale failure.

(2) The **CHANNEL FUNCTIONAL TEST** shall also demonstrate that Control Room alarm annunciation occurs if any of the following conditions exists:

1. Instrument indicates measured levels above the alarm setpoint.
2. Circuit failure.
3. Instrument indicates a downscale failure.

(3) The initial **CHANNEL CALIBRATION** shall be performed using one or more of the reference standards traceable to the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards shall permit calibrating the system within its intended range of energy and measurement range. For subsequent **CHANNEL CALIBRATION**, sources that have been related to the initial calibration can be used.

(4) The **CHANNEL CHECK** shall consist of verifying indication of flow during periods of release and shall be made at least once per 24 hours on days on which effluent releases are made.

3/4.3 **INSTRUMENTATION**

3/4.3.3 MONITORING INSTRUMENTATION

Radioactive Liquid Effluent Monitoring Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.10 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.3-13 shall be **OPERABLE** with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.1.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined and adjusted in accordance with the methodology and parameters in the **OFFSITE DOSE CALCULATION MANUAL (ODCM)**.

APPLICABILITY: At all times.

ACTION:

a. With a radioactive liquid effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above Specification, without delay suspend the release of radioactive liquid effluents monitored by the affected channel, or declare the channel inoperable, or change the setpoint so it is acceptably conservative.

b. With less than the minimum number of radioactive liquid effluent monitoring instrumentation channels **OPERABLE**, take the **ACTION** shown in Table 3.3-13. Exert best efforts to return the instruments to **OPERABLE** status within 30 days and, if unsuccessful, explain in the next Semiannual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner.

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.10 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated **OPERABLE** by performance of the **CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION** and **CHANNEL FUNCTIONAL TEST** operations at the frequencies shown in Table 4.3-12.

TABLE 3.3-13

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

	INSTRUMENT	MINIMUM CHANNELS OPERABLE	ACTION
1.	GROSS RADIOACTIVITY MONITORS PROVIDING ALARM AND AUTOMATIC TERMINATION OF RELEASE		
	a. Liquid Radwaste Effluent Line	1	28
	b. Steam Generator Blowdown Effluent Line	1	29
2.	FLOW RATE MEASUREMENT DEVICES		
	a. Liquid Radwaste Effluent Line	1	30
	b. Steam Generator Blowdown Effluent Line	1	30

TABLE 3.3-13 (Continued)

ACTION STATEMENTS

ACTION 28 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, effluent releases may continue provided that prior to initiating a release:

a. At least two independent samples are analyzed in accordance with Specification 4.11.1.1.1, and

b. At least two technically qualified members of the Facility Staff independently verify the release rate calculations and two qualified operators verify the discharge valve line up.

ACTION 29 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, effluent releases via this pathway may continue provided grab samples are analyzed for gross radioactivity (beta or gamma) at the lower limit of detection defined in Table 4.11-1:

a. At least once per 12 hours when the specific activity of the secondary coolant is greater than 0.01 microcurie/gram **DOSE EQUIVALENT I-131**.

b. At least once per 48 hours when the specific activity of the secondary coolant is less than or equal to 0.01 microcurie/gram **DOSE EQUIVALENT I-131**.

ACTION 30 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours during actual releases. Pump performance curves may be used to estimate flow.

TABLE 4.3-12

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST
1. GROSS RADIOACTIVITY MONITORS PROVIDING ALARM AND AUTOMATIC TERMINATION OF RELEASE				
a. Liquid Radwaste Effluent Line	D	P	R(2)	SA(1)
b. Steam Generator Blowdown Effluent Line	D	P	R(2)	SA(1)
2. FLOW RATE MEASUREMENT DEVICES				
a. Liquid Radwaste Effluent Line	D(3)	NA	R	NA
b. Steam Generator Blowdown Effluent Line	D(3)	NA	R	NA

TABLE 4.3-12 (Continued)

TABLE NOTATION

(1) The **CHANNEL FUNCTIONAL TEST** sha'l also demonstrate that automatic isolation of this pathway and/or Control Room alarm annunciation occur if the appropriate following condition(s) exists:

1. Instrument indicates measured levels above the alarm/trip setpoint.

2. Circuit failure.

3. Instrument indicates a downscale failure.

(2) The initial **CHANNEL CALIBRATION** shall be performed using one or more of reference standards traceable to the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards shall permit calibrating the system within its intended range of energy and measurement range. For subsequent **CHANNEL CALIBRATION**, sources that have been related to the initial calibration can be used.

(3) **CHANNEL CHECK** shall consist of verifying indication of flow during periods of release. **CHANNEL CHECK** shall be made at least once per hours on days on which effluent releases are made.

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.

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LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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.

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* 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)	M	1, 2
b. ΔT Power	S	D(4),R	M	1
3. Reactor Coolant Flow - Low	S	R	M	1, 2
4. Pressurizer Pressure - High	S	R	M	1, 2
5. Containment Pressure - High	S	R	M	1, 2
6. Steam Generator Pressure - Low	S	R	M	1, 2
7. Steam Generator Water Level - Low	S	R	M	1, 2
8. Axial Flux Offset	S	R	M	1
9. a. Thermal Margin/Low Pressure	S	R	M	1, 2
b. Steam Generator Pressure Difference - High	S	R	M	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	M and S/U(1)	1, 2
13. Reactor Protection System Logic Matrix Relays	NA	NA	M and S/U(1)	1, 2
14. Reactor Trip Breakers	NA	NA	M	1, 2 and *

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 $\leq$ 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**.

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.

TABLE 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. SAFETY INJECTION (SIAS)[#]					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	6
b. Containment Pressure - High	4	2	3	1, 2, 3	7*
c. Pressurizer Pressure - Low	4	2	3	1, 2, 3[(a)]	7*
2. CONTAINMENT SPRAY (CSAS)					
a. Manual (Trip Buttons)	2	1	2	1, 2, 3, 4	6
b. Containment Pressure - High	4	2	3	1, 2, 3	11
3. CONTAINMENT ISOLATION (CIS)[#]					
a. Manual CIS (Trip Buttons)	2	1	2	1, 2, 3, 4	6
b. Containment Pressure - High	4	2	3	1, 2, 3	7*

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
4. MAIN STEAM LINE ISOLATION					
a. Manual (MSIV Hand Switches and Feed Head Isolation Hand Switches)	1/valve	1/valve	1/valve	1, 2, 3, 4	6
b. Steam Generator Pressure - Low	4/steam generator	2/steam generator	3/steam generator	1, 2, 3[(c)]	7*
5. CONTAINMENT SUMP RECIRCULATION (RAS)					
a. Manual RAS (Trip Buttons)	2	1	2	1, 2, 3, 4	6
b. Refueling Water Tank - Low	4	2	3	1, 2, 3	7*

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
6. CONTAINMENT PURGE VALVES ISOLATION					
a. Manual (Purge Valve Control Switches)	2/Penetration	1/Penetration	2/Penetration	6**	8
b. Containment Radiation - High Area Monitor	4	2	3	6**	8
7. LOSS OF POWER					
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	4/Bus	2/Bus	3/Bus	1, 2, 3	7*
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	4/Bus	2/Bus	3/Bus	1, 2, 3	7*

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
8. CVCS ISOLATION					
a. Manual (CVCS Isolation Valve Control Switches)	1/Valve	1/Valve	1/Valve	1,2,3,4	6
b. West Penetration Room/Letdown Heat Exchanger Room Pressure - High	4	2	3	1,2,3,4	7*
9. AUXILIARY FEEDWATER ACTUATION SYSTEM (AFAS)					
a. Manual (Trip Buttons)	2 sets of 2 per S/G	1 set of 2 per S/G	2 sets of 2 per S/G	1, 2, 3	6
b. Steam Generator Level - Low	4/SG	2/SG	3/SG	1, 2, 3	7
c. Steam Generator ΔP High	4/SG	2/SG	3/SG	1, 2, 3	7

TABLE 3.3-3 (Continued)

TABLE NOTATION

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

@ When the RCS temperature is:

(a) Greater than 350°F, the required **OPERABLE** HPSI pumps must be able to start automatically upon receipt of a SIAS signal,

(b) Between 350°F and 305°F, a transition region exists where the **OPERABLE** HPSI pump will be placed in pull-to-lock on a cooldown and restored to automatic status on a heatup.

(c) At 305°F and less, the required **OPERABLE** HPSI pump shall be in pull-to-lock and will not start automatically.

* The provisions of Specification 3.0.4 are not applicable.

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

(a) Trip function may be bypassed in this **MODE** when pressurizer pressure is < 1800 psia; bypass shall be automatically removed when pressurizer pressure is ≥ 1800 psia.

(c) Trip function may be bypassed in this **MODE** below 785 psia; bypass shall be automatically removed at or above 785 psia.

TABLE 3.3-3 (Continued)

ACTION STATEMENTS

ACTION 6 - With the number of **OPERABLE** channels one less than the Total Number of Channels, restore the inoperable channel to **OPERABLE** status within 48 hours or be in at least **HOT STANDBY** within the next 6 hours and in **COLD SHUTDOWN** within the following 30 hours.

ACTION 7 - With the number of **OPERABLE** channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in either the bypassed or tripped condition within 1 hour. For the purposes of testing and maintenance, the inoperable channel may be bypassed for up to 48 hours from time of initial loss of **OPERABILITY**; however, the inoperable channel shall then be either restored to **OPERABLE** status or placed in the tripped condition.

b. Within one hour, all functional units receiving an input from the inoperable channel are also placed in the same condition (either bypassed or tripped, as applicable) as that required by a. above for the inoperable channel.

c. The Minimum Channels **OPERABLE** requirement is met; however, one additional channel may be bypassed for up to 48 hours while performing tests and maintenance on that channel provided the other inoperable channel is placed in the tripped condition.

ACTION 8 - With less than the Minimum Channels **OPERABLE**, operation may continue provided the containment purge valves are maintained closed.

ACTION 11 - With the number of **OPERABLE** Channels one less than the Total Number of Channels, operation may proceed provided the inoperable channel is placed in the bypassed condition and the Minimum Channels **OPERABLE** requirement is demonstrated within 1 hour; one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.

TABLE 3.3-4

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
1. SAFETY INJECTION (SIAS)		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Containment Pressure - High	$\leq$ 4.75 psig	$\leq$ 4.75 psig
c. Pressurizer Pressure - Low	$\geq$ 1725 psia	$\geq$ 1725 psia
2. CONTAINMENT SPRAY (CSAS)		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Containment Pressure - High	$\leq$ 4.75 psig	$\leq$ 4.75 psig
3. CONTAINMENT ISOLATION (CIS)#		
a. Manual CIS (Trip Buttons)	Not Applicable	Not Applicable
b. Containment Pressure - High	$\leq$ 4.75 psig	$\leq$ 4.75 psig
4. MAIN STEAM LINE ISOLATION		
a. Manual (MSIV Hand Switches and Feed Head Isolation Hand Switches)	Not Applicable	Not Applicable
b. Steam Generator Pressure - Low	$\geq$ 685 psia	$\geq$ 685 psia

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

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
5. CONTAINMENT SUMP RECIRCULATION (RAS)		
a. Manual RAS (Trip Buttons)	Not Applicable	Not Applicable
b. Refueling Water Tank - Low	$\geq$ 24 inches above tank bottom	$\geq$ 24 inches above tank bottom
6. CONTAINMENT PURGE VALVES ISOLATION		
a. Manual (Purge Valve Control Switches)	Not Applicable	Not Applicable
b. Containment Radiation - High Area Monitor	$\leq$ 220 mr/hr	$\leq$ 220 mr/hr
7. LOSS OF POWER		
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	2450 $\pm$ 105 volts with a 2 $\pm$ 0.2 second time delay	2450 $\pm$ 105 volts with a 2 $\pm$ 0.2 second time delay
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	3628 $\pm$ 25 volts with a 8 $\pm$ 0.4 second time delay	3628 $\pm$ 25 volts with a 8 $\pm$ 0.4 second time delay

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
8. CVCS ISOLATION		
West Penetration Room/Letdown Heat Exchanger Room Pressure - High	≤ 0.5 psig	≤ 0.5 psig
9. AUXILIARY FEEDWATER ACTUATION SYSTEM (AFAS)		
a. Manual (Trip Buttons)	Not Applicable	Not Applicable
b. Steam Generator (A or B) Level - Low	-194" to -149" (inclusive)	-194" to -149" (inclusive)
c. Steam Generator ΔP-High (SG-A > SG-B)	≤ 130.0 psid	≤ 130.0 psid
d. Steam Generator ΔP-High (SG-B > SG-A)	≤ 130.0 psid	≤ 130.0 psid

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	1, 2, 3
c. Pressurizer Pressure - Low	S	R	M	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	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	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	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	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 M	NA 6**
b. Containment Radiation - High Area Monitor	S	R		

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

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Radiation Monitoring Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.1 The radiation monitoring instrumentation channels shown in Table 3.3-6 shall be **OPERABLE** with their alarm/trip setpoints within the specified limits.

APPLICABILITY: As shown in Table 3.3-6.

ACTION:

a. With a radiation monitoring channel alarm/trip setpoint exceeding the value shown in Table 3.3-6, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.

b. With one or more radiation monitoring channels inoperable, take the action shown in Table 3.3-6.

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.1 Each radiation monitoring 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 4.3-3.

TABLE 3.3-6

RADIATION MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ALARM/TRIP SETPOINT	MEASUREMENT RANGE	ACTION
1. AREA MONITORS					
a. Containment					
i. Purge & Exhaust Isolation	3	6	$\leq$ 220 mr/hr	10^{-1} - 10^{4} mr/hr	16
b. Containment Area High Range	2	1, 2, 3, & 4	$\leq$ 10 R/hr	1 - 10^{8} R/hr	30
2. PROCESS MONITORS					
a. Containment					
i. Gaseous Activity					
a) RCS Leakage Detection	1	1, 2, 3, & 4	Not Applicable	10^{1} - 10^{6} cpm	14
ii. Particulate Activity					
a) RCS Leakage Detection	1	1, 2, 3, & 4	Not Applicable	10^{1} - 10^{6} cpm	14
b. Noble Gas Effluent Monitors					
i. Main Vent Wide Range	1	1, 2, 3, & 4	*	10^{-7} to 10^{5} µCi/cc	30
ii. Main Steam Header	2	1, 2, 3, & 4	*	10^{-2} to 10^{5} R/hr	30

TABLE 3.3-6 (Continued)

TABLE NOTATION

* Alarm setpoint to be specified in a controlled document (e.g., setpoint control manual).

ACTION STATEMENTS

ACTION 14 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, comply with the **ACTION** requirements of Specification 3.4.6.1.

ACTION 16 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, comply with the **ACTION** requirements of Specification 3.9.9.

ACTION 30 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, initiate the preplanned alternate method of monitoring the appropriate parameter(s), within 72 hours, and:

1) either restore the inoperable channel(s) to **OPERABLE** status within 7 days of the event, or

2) prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event, outlining the action taken, the cause of the inoperability, and the plans and schedule for restoring the system to **OPERABLE** status.

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

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Incore Detectors

LIMITING CONDITION FOR OPERATION

3.3.3.2 The Incore Detection System shall be **OPERABLE** with at least one **OPERABLE** detector segment in each core quadrant on each of the four axial elevations containing incore detectors and as further specified below:

a. For monitoring the **AZIMUTHAL POWER TILT**:*

At least two quadrant symmetric incore detector segment groups at each of the four axial elevations containing incore detectors in the outer 184 fuel assemblies with sufficient **OPERABLE** detector segments in these detector groups to compute at least two **AZIMUTHAL POWER TILT** values at each of the four axial elevations containing incore detectors.

b. For recalibration of the Excore Neutron Flux Detection System:

1. At least 75%** of all incore detector segments,

2. A minimum of 9 **OPERABLE** incore detector segments at each detector segment level, and

3. A minimum of 2 **OPERABLE** detector segments in the inner 109 fuel assemblies and 2 **OPERABLE** segments in the outer 108 fuel assemblies at each segment level.

---

* For Unit 2 Cycle 10 only, the following requirements shall be substituted for Limiting Condition for Operation 3.3.3.2.a:

At least eight quadrant symmetric incore detector segment groups containing incore detectors in the outer 184 fuel assemblies with sufficient **OPERABLE** detector segments in these detector groups to compute at least one **AZIMUTHAL POWER TILT** value at each of the four axial elevations containing incore detectors and at least two **AZIMUTHAL POWER TILT** values at three axial elevations containing incore detectors.

** For Unit 2 Cycle 10 only, the following requirement shall be substituted for Limiting Condition for Operation 3.3.3.2.b.1:

At least 60% of all incore detector segments,

LIMITING CONDITION FOR OPERATION (Continued)

c. For monitoring the **UNRODDED PLANAR RADIAL PEAKING FACTOR**, the **UNRODDED INTEGRATED RADIAL PEAKING FACTOR**, or the linear heat rate:

1. At least 75%* of all incore detector locations,

2. A minimum of 9 **OPERABLE** incore detector segments at each detector segment level, and

3. A minimum of 2 **OPERABLE** detector segments in the inner 109 fuel assemblies and 2 **OPERABLE** segments in the outer 108 fuel assemblies at each segment level.

An **OPERABLE** incore detector segment shall consist of an **OPERABLE** rhodium detector constituting one of the segments in a fixed detector string.

An **OPERABLE** incore detector location shall consist of a string in which at least three of the four incore detector segments are **OPERABLE**.

An **OPERABLE** quadrant symmetric incore detector segment group shall consist of a minimum of three **OPERABLE** rhodium incore detector segments in 90° symmetric fuel assemblies.

APPLICABILITY: When the Incore Detection System is used for:

a. Monitoring the **AZIMUTHAL POWER TILT**,

b. Recalibration of the Excore Neutron Flux Detection System, or

c. Monitoring the **UNRODDED PLANAR RADIAL PEAKING FACTOR**, the **UNRODDED INTEGRATED RADIAL PEAKING FACTOR**, or the linear heat rate.

ACTION: With the Incore Detection System inoperable, do not use the system for the above applicable monitoring or calibration functions. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

---

* For Unit 2 Cycle 10 only, the following requirement shall be substituted for Limiting Condition for Operation 3.3.3.2.c.1:

At least 60% of all incore detector locations,

SURVEILLANCE REQUIREMENTS

4.3.3.2 The Incore Detection System shall be demonstrated **OPERABLE**:

a. By performance of a **CHANNEL CHECK** within 24 hours prior to its use and at least once per 7 days thereafter when required for:

1. Monitoring the **AZIMUTHAL POWER TILT**.

2. Recalibration of the Excore Neutron Flux Detection System.

3. Monitoring the **UNRODDED PLANAR RADIAL PEAKING FACTOR**, the **UNRODDED INTEGRATED RADIAL PEAKING FACTOR**, or the linear heat rate.

b. At least once per **REFUELING INTERVAL** by performance of a **CHANNEL CALIBRATION** operation which exempts the neutron detectors but includes all electronic components. The neutron detectors shall be calibrated prior to installation in the reactor core.

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Seismic Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.3 The seismic monitoring instrumentation shown in Table 3.3-7 shall be **OPERABLE**.

APPLICABILITY: At all times.

ACTION:

a. With one or more seismic monitoring instruments inoperable for more than 30 days, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 10 days outlining the cause of the malfunction and the plans for restoring the instrument(s) to **OPERABLE** status.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.3.1 Each of the above seismic monitoring instruments shall be demonstrated **OPERABLE** by the performance of the **CHANNEL CHECK, CHANNEL CALIBRATION** and **CHANNEL FUNCTIONAL TEST** operations at the frequencies shown in Table 4.3-4.

4.3.3.3.2 Each of the above seismic monitoring instruments actuated during a seismic event shall be restored to **OPERABLE** status within 24 hours and a **CHANNEL CALIBRATION** performed within 5 days following the seismic event. Data shall be retrieved from actuated instruments and analyzed to determine the magnitude of the vibratory ground motion. A Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 10 days describing the magnitude, frequency spectrum and resultant effect upon facility features important to safety.

TABLE 3.3-7

SEISMIC MONITORING INSTRUMENTATION

INSTRUMENTS AND SENSOR LOCATIONS	MEASUREMENT RANGE	MINIMUM INSTRUMENT OPERABLE
1. Triaxial Time-History Strong Motion Accelographs		
a. O-YE-001 Unit 1 Containment Base	0-1g	1
b. O-YE-002 Unit 1 Containment 69'	0-1g	1
c. O-YE-003 Auxiliary Bldg. Base	0-1g	1
d. O-YE-004 Intake Structure	0-1g	1
e. O-YE-005 Free Field	0-1g	1
2. Triaxial Seismic Switches		
a. O-YS-001 Unit 1 Containment Base	NA	1
b. O-YS-002 Unit 1 Containment 69'	NA	1
3. Seismic Acceleration Recorder		
a. O-YRC-001 Control Room	NA	1
b. O-YR-001 Control Room	NA	1

TABLE 4.3-4

SEISMIC MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENTS AND SENSOR LOCATIONS	CHANNEL CHECK**	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST
1. Triaxial Time-History Strong Motion Accelographs			
a. O-YE-001 Unit 1 Containment Base	M*	R	SA
b. O-YE-002 Unit 1 Containment 69'	M*	R	SA
c. O-YE-003 Auxiliary Bldg. Base	M*	R	SA
d. O-YE-004 Intake Structure	M*	R	SA
e. O-YE-005 Free Field	M*	R	SA
2. Triaxial Seismic Switches			
a. O-YS-001 Unit 1 Containment Base	M	R	SA
b. O-YS-002 Unit 1 Containment 69'	M	R	SA
3. Seismic Acceleration Recorder			
a. O-YRC-001 Control Room	M	R	SA
b. O-YR-001 Control Room	M	R	SA

** Verify instrument energized.

* Except seismic trigger.

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Meteorological Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.4 The meteorological monitoring instrumentation channels shown in Table 3.3-8 shall be **OPERABLE**.

APPLICABILITY: At all times.

ACTION:

a. With one or more required meteorological monitoring channels inoperable for more than 7 days, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 10 days outlining the cause of the malfunction and the plans for restoring the channel(s) to **OPERABLE** status.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.4 Each of the above meteorological monitoring instrumentation channels shall be demonstrated **OPERABLE** by the performance of the **CHANNEL CHECK** and **CHANNEL CALIBRATION** operations at the frequencies shown in Table 4.3-5.

TABLE 3.3-8

METEOROLOGICAL MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE
1. WIND SPEED	
a. Nominal Elev. 10M	1
b. Nominal Elev. 60M	1
2. WIND DIRECTION	
a. Nominal Elev. 10M	1
b. Nominal Elev. 60M	1
3. AIR TEMPERATURE - DELTA T (10M-60M)	1

TABLE 4.3-5

METEOROLOGICAL MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION
1. WIND SPEED		
a. Nominal Elev. 10M	D	SA
b. Nominal Elev. 60M	D	SA
2. WIND DIRECTION		
a. Nominal Elev. 10M	D	SA
b. Nominal Elev. 60M	D	SA
3. AIR TEMPERATURE - DELTA T (10M-50M)	D	SA

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Remote Shutdown Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.5 The remote shutdown monitoring instrumentation channels shown in Table 3.3-9 shall be **OPERABLE** with readouts displayed external to the Control Room.

APPLICABILITY: **MODES** 1, 2 and 3.

ACTION:

a. With the number of **OPERABLE** remote shutdown monitoring channels less than required by Table 3.3-9, either restore the inoperable channel to **OPERABLE** status within 30 days, or be in **HOT SHUTDOWN** within the next 12 hours.

b. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.5 Each remote shutdown monitoring instrumentation channel shall be demonstrated **OPERABLE** by performance of the **CHANNEL CHECK** and **CHANNEL CALIBRATION** operations at the frequencies shown in Table 4.3-6.

TABLE 3.3-9

REMOTE SHUTDOWN MONITORING INSTRUMENTATION

INSTRUMENT	READOUT LOCATION	MEASUREMENT RANGE	MINIMUM CHANNELS OPERABLE
1. Wide Range Neutron Flux*	2C43	0.1 cps-200%	1
2. Reactor Trip Breaker Indication	Cable Spreading Room	OPEN-CLOSE	1/trip breaker
3. Reactor Coolant Cold Leg Temperature	2C43	212-705°F	1
4. Pressurizer Pressure	2C43	0-4000 psia	1
5. Pressurizer Level	2C43	0-360 inches	1
6. Steam Generator Pressure	2C43	0-1200 psig	1/steam generator
7. Steam Generator Level	2C43	-401 to +63.5 inches	1/steam generator

* When the 2C43 instrumentation is inoperable, the wide range neutron flux monitors located in the auxiliary feedwater pump room may be utilized to meet this requirement. During the period when the instruments are utilized to meet the above requirement, they will be subject to the surveillance requirements of Table 4.3-6.

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	M	R
7. Steam Generator Pressure	M	R

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Post-Accident Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.6 The post-accident monitoring instrumentation channels shown in Table 3.3-10 shall be **OPERABLE**.

APPLICABILITY: **MODES** 1, 2 and 3.

ACTION:

a. As shown in Table 3.3-10.

b. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.6 Each post-accident monitoring instrumentation channel shall be demonstrated **OPERABLE** by performance of the **CHANNEL CHECK** and **CHANNEL CALIBRATION** operations at the frequencies shown in Table 4.3-10.

TABLE 3.3-10

POST-ACCIDENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	ACTION
1. Containment Pressure	2	31
2. Wide Range Logarithmic Neutron Flux Monitor	2	31
3. Reactor Coolant Outlet Temperature	2	31
4. Pressurizer Pressure	2	31
5. Pressurizer Level	2	31
6. Steam Generator Pressure	2/steam generator	31
7. Steam Generator Level (Wide Range)	2/steam generator	31
8. Auxiliary Feedwater Flow Rate	2/steam generator	31
9. RCS Subcooled Margin Monitor	1	31
10. PORV/Safety Valve Acoustic Flow Monitoring	1/valve	31
11. PORV Solenoid Power Indication	1/valve	31
12. Feedwater Flow	2	31
13. Containment Water Level (Wide Range)	2	32, 33
14. Reactor Vessel Water Level	2*	34, 35
15. Core Exit Thermocouple System	2 locations/core quadrant	31

* A channel has eight sensors in a probe. A channel is **OPERABLE** if four or more sensors, one or more in the upper three and three or more in the lower five, are **OPERABLE**.

TABLE 3.3-10 (Continued)

ACTION STATEMENTS

ACTION 31 - With the number of **OPERABLE** post-accident monitoring channels less than required by Table 3.3-10, either restore the inoperable channel to **OPERABLE** status within 30 days or be in **HOT SHUTDOWN** within the next 12 hours.

ACTION 32 - With the number of **OPERABLE** post-accident monitoring channels one less than the Minimum Channels **OPERABLE** requirement in Table 3.3-10, operation may proceed provided the inoperable channel is restored to **OPERABLE** status at the next outage of sufficient duration.

ACTION 33 - With the number of **OPERABLE** post-accident monitoring channels two less than required by Table 3.3-10, either restore one inoperable channel to **OPERABLE** status within 30 days or be in **HOT SHUTDOWN** within the next 12 hours.

ACTION 34 - With the number of **OPERABLE** post-accident monitoring channels one less than the Minimum Channels **OPERABLE** requirement in Table 3.3-10, either restore the system to **OPERABLE** status within 7 days if repairs are feasible without shutting down or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event, outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to **OPERABLE** status.

ACTION 35 - With the number of **OPERABLE** channels two less than required by Table 3.3-10, either restore the inoperable channel(s) to **OPERABLE** status within 48 hours if repairs are feasible without shutting down or:

1. Initiate an alternate method of monitoring for core and Reactor Coolant System voiding;

2. Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days following the event, outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to **OPERABLE** status; and

3. Restore the system to **OPERABLE** status at the next scheduled refueling.

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	NA	R
11. PORV Solenoid Power Indication	NA	NA
12. Feedwater Flow	M	R
13. Containment Water Level (Wide Range)	M	R
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.

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Fire Detection Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.7 As a minimum, the fire detection instrumentation for each fire detection zone shown in Table 3.3-11 shall be **OPERABLE**.

APPLICABILITY: Whenever equipment in that fire detection zone is required to be **OPERABLE**.

ACTION: With one or more of the fire detection instrument(s) shown in Table 3.3-11 inoperable:

a. Within 1 hour establish a fire watch patrol to inspect the zone(s) with the inoperable instrument(s) at least once per hour, unless the instrument(s) is located inside the containment, then inspect the containment at least once per 8 hours or monitor the containment air temperature at least once per hour at the locations listed in Specification 4.6.1.5; or unless the instrument(s) is located in fire detection zones equipped with automatic wet pipe sprinkler systems alarmed and supervised to the Control Room, then within 1 hour and at least per 24 hours thereafter, inspect the zone(s) with inoperable instruments and verify that the Automatic Sprinkler System, including the water flow alarm and supervisory system, is **OPERABLE** by **CHANNEL FUNCTIONAL TEST**.

b. Restore the inoperable instrument(s) to **OPERABLE** status within 14 days or prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the instrument(s) to **OPERABLE** status.

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.7.1 At least once per 6 months, at least 25% of the above required fire detection instruments which are accessible during plant operation shall be demonstrated **OPERABLE** by performance of a **CHANNEL FUNCTIONAL TEST**. Detectors selected for testing shall be selected on a rotating basis such

SURVEILLANCE REQUIREMENTS (Continued)

that all detectors will be tested over a two year period. If in any detection zone there are less than four detectors, at least one different detector in that zone shall be tested every six months. For each detector found inoperable during functional testing, at least an additional 10% of all detectors or 10 detectors, whichever is less, shall also be tested. Fire detectors which are inaccessible during plant operation shall be demonstrated **OPERABLE** by the performance of a **CHANNEL FUNCTIONAL TEST** during each **COLD SHUTDOWN** exceeding 24 hours unless performed during the previous six months.

4.3.3.7.2 The NFPA Code 72D Class B supervised circuits supervision associated with the detector alarms of each of the above required fire detection instruments shall be demonstrated **OPERABLE** at least once per 6 months.

4.3.3.7.3 The non-supervised circuits, associated with detector alarms, between the instrument and the Control Room shall be demonstrated **OPERABLE** at least once per 31 days.

TABLE 3.3-11

FIRE DETECTION INSTRUMENTS
UNIT 2

ROOM/AREA AUX BLDG.	INSTRUMENT LOCATION	MINIMUM INSTRUMENTS OPERABLE* HEAT	FLAME	SMOKE
101/120	ECCS Pump Room			7
102/121	ECCS Pump Room			7
105	Charging Pump Room			3
106	Misc Waste Monitor Tank			1
107/109	Coolant Waste Monitor Tank		4	
108	Pump Room-Elev (-)10'-0"			1
201	Component Cooling Pump Rm			9
203	East Piping Area			10
204	Rad Exhaust Vent, Equip Rm			4
205	Service Water Pump Rm		3	6
206/310	East Piping Pen Rm		3	5
211/321	West Piping Pen Rm		2	3
213	Degasifier Pump Rm			1
214	Volume Control Tank Rm			1
215	Boric Acid Tank & Pump Rm			2
216A	Reactor Coolant Make-up Pumps			2
302/2C	U2 Cable Spreading Rm & Cable Chase**	2		10
305/307/303	U2 Battery Rm & Corridor			3
309	Main Steam Piping Area			6
311	Switchgear Rm, Elev 27'-0"			6
312	Purge Air Supply Rm			2
322	Letdown Heat Exchanger Rm			1
Elev. 27'-0"	Switchgear Vent Duct	1		
2A	Cable Chase 2A			1
2B	Cable Chase 2B			1

* Detection instruments located within the containment are not required to be **OPERABLE** during the performance of Type A Containment Leakage Rate Tests.

** Detectors which automatically actuate Fire Suppression Systems.

TABLE 3.3-11 (Continued)

FIRE DETECTION INSTRUMENTS
UNIT 2

ROOM/AREA AUX BLDG.	INSTRUMENT LOCATION	MINIMUM INSTRUMENTS OPERABLE* HEAT	FLAME	SMOKE
407	Switchgear Rm, Elev 45'-0"**			8
408	East Piping Area			7
409	East Electrical Pen Rm			3
414	West Electrical Pen Rm			3
416	Diesel Generator No. (21)**	2		
440	Refueling Water Tank Pump Rm			2
Elev. 45'-0"	Switchgear Vent Duct	1		
526	Main Plant Exhaust Equip Rm			8
527	Containment Access			3
532	Electrical Equip Rm			3
Elev. 69'-0"	Cable Spreading Room Vent Duct			1
Elev. 83'-0"	Cable Tunnel			4
605	Auxiliary Feedwater Pump Rm			2
Containment Bldg.				
UNIT 2	RCP Bay East*	16		
UNIT 2	RCP Bay West*	16		
UNIT 2	East Electric Pen Area*	+		
UNIT 2	West Electric Pen Area*	+		
Intake Structure Elev 3'-0"	Unit 2 Side			24

* Detection instruments located within the containment are not required to be OPERABLE during the performance of Type A Containment Leakage Rate Tests.

** Detectors which automatically actuate Fire Suppression Systems.

\+ Monitored by four protecto wires.

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Radioactive Gaseous Effluent Monitoring Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.9 The radioactive gaseous effluent monitoring instrumentation channels shown in Table 3.3-12 shall be **OPERABLE** with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.2.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined and adjusted in accordance with the methodology and parameters in the **ODCM**.

APPLICABILITY: As shown in Table 3.3-12.

ACTION:

a. With a radioactive gaseous effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above Specification, without delay suspend the release of radioactive gaseous effluents monitored by the affected channel, or declare the channel inoperable, or change the setpoint so it is acceptably conservative.

b. With less than the minimum number of radioactive gaseous effluent monitoring instrumentation channels **OPERABLE**, take the **ACTION** shown in Table 3.3-12. Exert best efforts to return the instruments to **OPERABLE** status within 30 days and, if unsuccessful, explain in the next Semiannual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner.

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.9 Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated **OPERABLE** by performance of the **CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION** and **CHANNEL FUNCTIONAL TEST** operations at the frequencies shown in Table 4.3-11.

TABLE 3.3-12

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
1. WASTE GAS HOLDUP SYSTEM			
a. Noble Gas Activity Monitor - Providing Alarm and Automatic Termination of Release	1	*	35
b. Effluent System Flow Rate Measuring Device	1	*	36
2. MAIN VENT SYSTEM			
a. Noble Gas Activity Monitor	1	*	37
b. Iodine Sampler	1	*	38
c. Particulate Sampler	1	*	38

TABLE 3.3-12 (Continued)

TABLE NOTATION

* At all times.

ACTION STATEMENTS

ACTION 35 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, the contents of the tank(s) may be released to the environment:

a. Using the main vent monitor as a backup and recording RMS readings every 15 minutes during the release, or

b. Provided that prior to initiating the release, at least two independent samples of the tank's contents are analyzed, and at least two technically qualified members of the Facility Staff independently verify the release rate calculations and two qualified operators verify the discharge valve lineup.

Otherwise, suspend release of radioactive effluents via this pathway.

ACTION 36 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours.

ACTION 37 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, effluent releases via this pathway may continue provided either (1) grab samples are taken and analyzed for gross activity at least once per 24 hours, or (2) an equivalent monitor is provided.

ACTION 38 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, effluent releases via the affected pathway may continue provided samples are continuously collected as required in Table 4.11-2 with auxiliary sampling equipment.

TABLE 4.3-11

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
1. WASTE GAS HOLDUP SYSTEM					
a. Noble Gas Activity Monitor - Providing Alarm and Automatic Termination of Release	P	P	R(3)	SA(1)	*
b. Effluent System Flow Rate Measuring Device	D(4)	NA	R	NA	*
2. MAIN VENT SYSTEM					
a. Noble Gas Activity Monitor	D	M	R(3)	SA(2)	*
b. Iodine Sampler	W	NA	NA	NA	*
c. Particulate Sampler	W	NA	NA	NA	*

TABLE 4.3-11 (Continued)

TABLE NOTATION

* At all times other than when the line is valved out and locked.

(1) The **CHANNEL FUNCTIONAL TEST** shall also demonstrate the automatic isolation of this pathway and/or Control Room alarm annunciation occurs if the appropriate following condition(s) exists:

1. Instrument indicates measure levels above the alarm/trip setpoint.
2. Circuit failure.
3. Instrument indicates a downscale failure.

(2) The **CHANNEL FUNCTIONAL TEST** shall also demonstrate that Control Room alarm annunciation occurs if any of the following conditions exist:

1. Instrument indicates measured levels above the alarm setpoint.
2. Circuit failure.
3. Instrument indicates a downscale failure.

(3) The initial **CHANNEL CALIBRATION** shall be performed using one or more of the reference standards traceable to the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards shall permit calibrating the system within its intended range of energy and measurement range. For subsequent **CHANNEL CALIBRATION**, sources that have been related to the initial calibration can be used.

(4) The **CHANNEL CHECK** shall consist of verifying indication of flow during periods of release and shall be made at least once per 24 hours on days on which effluent releases are made.

3/4.3 INSTRUMENTATION

3/4.3.3 MONITORING INSTRUMENTATION

Radioactive Liquid Effluent Monitoring Instrumentation

LIMITING CONDITION FOR OPERATION

3.3.3.10 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.3-13 shall be **OPERABLE** with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.1.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined and adjusted in accordance with the methodology and parameters in the **OFFSITE DOSE CALCULATION MANUAL (ODCM)**.

APPLICABILITY: At all times.

ACTION:

a. With a radioactive liquid effluent monitoring instrumentation channel alarm/trip setpoint less conservative than required by the above Specification, without delay suspend the release of radioactive liquid effluents monitored by the affected channel, or declare the channel inoperable, or change the setpoint so it is acceptably conservative.

b. With less than the minimum number of radioactive liquid effluent monitoring instrumentation channels **OPERABLE**, take the **ACTION** shown in Table 3.3-13. Exert best efforts to return the instruments to **OPERABLE** status within 30 days and, if unsuccessful, explain in the next Semiannual Radioactive Effluent Release Report why the inoperability was not corrected in a timely manner.

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.10 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated **OPERABLE** by performance of the **CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION** and **CHANNEL FUNCTIONAL TEST** operations at the frequencies shown in Table 4.3-12.

TABLE 3.3-13

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	ACTION
1. GROSS RADIOACTIVITY MONITORS PROVIDING ALARM AND AUTOMATIC TERMINATION OF RELEASE		
a. Liquid Radwaste Effluent Line	1	28
b. Steam Generator Blowdown Effluent Line	1	29
2. FLOW RATE MEASUREMENT DEVICES		
a. Liquid Radwaste Effluent Line	1	30
b. Steam Generator Blowdown Effluent Line	1	30

TABLE 3.3-13 (Continued)

ACTION STATEMENTS

ACTION 28 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, effluent releases may continue provided that prior to initiating a release:

a. At least two independent samples are analyzed in accordance with Specification 4.11.1.1.1, and

b. At least two technically qualified members of the Facility Staff independently verify the release rate calculations and two qualified operators verify the discharge valve line up.

ACTION 29 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, effluent releases via this pathway may continue provided grab samples are analyzed for gross radioactivity (beta or gamma) at the lower limit of detection defined in Table 4.11-1:

a. At least once per 12 hours when the specific activity of the secondary coolant is greater than 0.01 microcurie/gram **DOSE EQUIVALENT I-131**.

b. At least once per 48 hours when the specific activity of the secondary coolant is less than or equal to 0.01 microcurie/gram **DOSE EQUIVALENT I-131**.

ACTION 30 - With the number of channels **OPERABLE** less than required by the Minimum Channels **OPERABLE** requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours during actual releases. Pump performance curves may be used to estimate flow.

TABLE 4.3-12

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	FUNCTIONAL TEST
1. GROSS RADIOACTIVITY MONITORS PROVIDING ALARM AND AUTOMATIC TERMINATION OF RELEASE				
a. Liquid Radwaste Effluent Line	D	P	R(2)	SA(1)
b. Steam Generator Blowdown Effluent Line	D	P	R(2)	SA(1)
2. FLOW RATE MEASUREMENT DEVICES				
a. Liquid Radwaste Effluent Line	D(3)	NA	R	NA
b. Steam Generator Blowdown Effluent Line	D(3)	NA	R	NA

TABLE 4.3-12 (Continued)

TABLE NOTATION

(1) The **CHANNEL FUNCTIONAL TEST** shall also demonstrate that automatic isolation of this pathway and/or Control Room alarm annunciation occur if the appropriate following condition(s) exist:

1. Instrument indicates measured levels above the alarm/trip setpoint.

2. Circuit failure.

3. Instrument indicates a downscale failure.

(2) The initial **CHANNEL CALIBRATION** shall be performed using one or more of the reference standards traceable to the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards shall permit calibrating the system within its intended range of energy and measurement range. For subsequent **CHANNEL CALIBRATION**, sources that have been related to the initial calibration can be used.

(3) **CHANNEL CHECK** shall consist of verifying indication of flow during periods of release. **CHANNEL CHECK** shall be made at least once per 24 hours on days on which effluent releases are made.

3/4.3 INSTRUMENTATION

BASES

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.