LIST OF TABLES

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR PROTECTIVE INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1 shall be OPERABLE with RESPONSE TIMES as shown in Table 3.3-2.

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

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

4.3.1.2 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.

4.3.1.3 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.

4.3.1.4 The isolation characteristics of each CEA isolation amplifier and each optical isolator for CEA Calculator to Core Protection Calculator data transfer shall be verified at least once per 18 months during the shutdown per the following tests:

a. For the CEA position isolation amplifiers:

1. With 120 volts AC (60 Hz) applied for at least 30 seconds across the output, the reading on the input does not exceed 0.015 volts DC.

TABLE 3.3-2

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME
1. Manual Reactor Trip	Not Applicable
2. Linear Power Level - High	$\leq$ 0.40 second*
3. Logarithmic Power Level - High	$\leq$ 0.40 second*
4. Pressurizer Pressure - High	$\leq$ 0.90 second
5. Pressurizer Pressure - Low	$\leq$ 0.90 second
6. Containment Pressure - High	$\leq$ 1.70 seconds
7. Steam Generator Pressure - Low	$\leq$ 0.90 second
8. Steam Generator Level - Low	$\leq$ 0.90 second
9. Local Power Density - High	
a. Neutron Flux Power from Excore Neutron Detectors	$\leq$ 0.429 second*
b. CEA Positions	$\leq$ 0.424 second**
c. CEA Positions: CEAC Penalty Factor	$\leq$ 0.379 second
10. DNBR - Low	
a. Neutron Flux Power from Excore Neutron Detectors	$\leq$ 0.429 second*
b. CEA Positions	$\leq$ 0.424 second**
c. Cold Leg Temperature	$\leq$ 0.258 second#
d. Hot Leg Temperature	$\leq$ 0.429 second#
e. Primary Coolant Pump Shaft Speed	$\leq$ 0.237 second**
f. Reactor Coolant Pressure from Pressurizer	$\leq$ 0.429 second##
g. CEA Positions: CEAC Penalty Factor	$\leq$ 0.379 second

TABLE 3.3-2 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME
11. Steam Generator Level - High	Not Applicable
12. Reactor Protection System Logic	Not Applicable
13. Reactor Trip Breakers	Not Applicable
14. Core Protection Calculators	Not Applicable
15. CEA Calculators	Not Applicable
16. Reactor Coolant Flow - Low	0.70 second

*Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input of first electronic component in channel.

**Response time shall be measured from the time the CPC/CEAC receives an input signal until the electrical power is interrupted to the CEA drive mechanism.

#Response time shall be measured from the output of the sensor. RTD response time for all the RTDs shall be measured at least once per 18 months. The measured P_t of the slowest RTD shall be less than or equal to 8 seconds (P_t assumed in the safety analysis).

##Response time shall be measured from the output of the pressure transmitter. The transmitter response time shall be less than or equal to 0.70 second.

3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The Engineered Safety Features 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 and with RESPONSE TIMES as shown in Table 3.3-5.

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

4.3.2.2 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.

4.3.2.3 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 3.3-5

ENGINEERED SAFETY FEATURES RESPONSE TIMES

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
1. Manual	
a. SIAS	
Safety Injection (ECCS)	Not Applicable
Shield Building Filtration System	Not Applicable
b. CSAS	
Containment Spray	Not Applicable
c. CIAS	
Containment Isolation	Not Applicable
d. MSIS	
Main Steam Isolation	Not Applicable
e. RAS	
Safety Injection System Sump Recirculation	Not Applicable
f. EFAS	
Emergency Feedwater Pumps	Not Applicable

TABLE 3.3-5 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
2. Pressurizer Pressure-Low	
a. Safety Injection (ECCS)	
(1) High Pressure Safety Injection	≤ 30.0*/18.5**
(2) Low Pressure Safety Injection	≤ 45.5*/34.0**
b. Containment Isolation	≤ 23.5*/12.0**
c. Containment Cooling	≤ 31.0*/19.5**
3. Containment Pressure-High	
a. Safety Injection (ECCS)	
(1) High Pressure Safety Injection	≤ 30.0*/18.5**
(2) Low Pressure Safety Injection	≤ 45.5*/34.0**
b. Containment Isolation	≤ 23.5*/12.0**
c. Main Steam Isolation	≤ 5.0*/5.0**
d. Main Feedwater Isolation	≤ 6.0*/6.0**
e. Containment Cooling	≤ 31.0*/19.5**
4. Containment Pressure--High-High	
a. Containment Spray Pump	≤ 15.2*/2.7**
b. Containment Spray Valves	≤ 11.0*/11.0**
c. CCW to RCP Valves	≤ 23.5*/12.0**
5. Containment Area Radiation-High#	
Containment Purge Valves Isolation	≤ 6.2*/6.2**
6. Steam Generator Pressure-Low	
a. Main Steam Isolation	≤ 5.0*/5.0**
b. Main Feedwater Isolation	≤ 6.0*/6.0**
7. Refueling Water Storage Pool-Low	
Containment Sump Recirculation	≤ 120.0*/108.5**
8. 4.16 kV Emergency Bus Undervoltage (Loss of Voltage)	
Loss of Power (0 volts)	≤ 2***
9. 480V Emergency Bus Undervoltage (Loss of Voltage)	
Loss of Power (0 volts)	N.A.
10. 4.16 kV Emergency Bus Undervoltage (Degraded Voltage)	
Loss of Power	≤ 14***

TABLE 3.3-5 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
11. Steam Generator Level-Low	
Emergency Feedwater Pump and Block Valves	≤ 54.0*/42.0**
12. Wide Range Steam Generator Level-Low	
Emergency Feedwater Control Valves	≤ 25.0*/25.0**
NOTE: Response time for all Motor-Driven and Steam-Driven Emergency Feedwater Pumps on all ESF signal starts.	≤ 54.0

TABLE NOTATIONS

*Diesel generator starting and sequence loading delays included. Response time limit includes movement of valves and attainment of pump or blower discharge pressure.

**Diesel generator starting and sequence loading delays not included. Offsite power available. Response time limit includes movement of valves and attainment of pump or blower discharge pressure.

***Response time measured from the sensing relay to the channel output only.

#Response time does not include the detector.

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ATTACHMENT B

LIST OF TABLES

DELETE

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR PROTECTIVE INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the reactor protective instrumentation channels and bypasses of Table 3.3-1 shall be OPERABLE ~~with RESPONSE TIMES as shown in Table 3.3-2~~.

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

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

4.3.1.2 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.

4.3.1.3 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. Neutron detectors are exempt from response time testing. 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.

4.3.1.4 The isolation characteristics of each CEA isolation amplifier and each optical isolator for CEA Calculator to Core Protection Calculator data transfer shall be verified at least once per 18 months during the shutdown per the following tests:

a. For the CEA position isolation amplifiers:

1. With 120 volts AC (60 Hz) applied for at least 30 seconds across the output, the reading on the input does not exceed 0.015 volts DC.

TABLE 3.3-2

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT		RESPONSE TIME
1.	Manual Reactor Trip	Not Applicable
2.	Linear Power Level - High	≤ 0.40 second*
3.	Logarithmic Power Level - High	≤ 0.40 second*
4.	Pressurizer Pressure - High	≤ 0.90 second
5.	Pressurizer Pressure - Low	≤ 0.90 second
6.	Containment Pressure - High	≤ 1.70 seconds
7.	Steam Generator Pressure - Low	≤ 0.90 second
8.	Steam Generator Level - Low	≤ 0.90 second
9.	Local Power Density - High	
	a. Neutron Flux Power from Excore Neutron Detectors	≤ 0.429 second*
	b. CEA Positions	≤ 0.424 second**
	c. CEA Positions - CEAC Penalty Factor	≤ 0.379 second
10.	DNBR - Low	
	a. Neutron Flux Power from Excore Neutron Detectors	≤ 0.429 second *
	b. CEA Positions	≤ 0.424 second**
	c. Cold Leg Temperature	≤ 0.258 second#
	d. Hot leg Temperature	≤ 0.429 second#
	e. Primary Coolant Pump Shaft Speed	≤ 0.237 second**
	f. Reactor Coolant Pressure from Pressurizer	≤ 0.429 second##
	g. CEA Positions - CEAC Penalty Factor	≤ 0.379 second

TABLE 3.3-2 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT		RESPONSE TIME
11.	Steam Generator Level -- High	Not Applicable
12.	Reactor Protection System Logic	Not Applicable
13.	Reactor Trip Breakers	Not Applicable
14.	Core Protection Calculators	Not Applicable
15.	CEA Calculators	Not Applicable
16.	Reactor Coolant Flow -- Low	0.70 second

*Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input of first electronic component in channel.

**Response time shall be measured from the time the CPC/CEAC receives an input signal until the electrical power is interrupted to the CEA drive mechanism.

#Response time shall be measured from the output of the sensor. RTD response time for all the RTDs shall be measured at least once per 18 months. The measured P_t of the slowest RTD shall be less than or equal to 8 seconds (P_t assumed in the safety analysis).

##Response time shall be measured from the output of the pressure transmitter. The transmitter response time shall be less than or equal to 0.70 second.

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3/4.3.2 ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The Engineered Safety Features 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. ~~and with RESPONSE TIMES as shown in Table 3.3-5.~~

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

4.3.2.2 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.

4.3.2.3 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 3.3-5

ENGINEERED SAFETY FEATURES RESPONSE TIMES

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
1. Manual	
a. SIAS	
Safety Injection (ECCS)	Not Applicable
Shield Building Filtration System	Not Applicable
b. CSAS	
Containment Spray	Not Applicable
c. CIAS	
Containment Isolation	Not Applicable
d. MSIS	
Main Steam Isolation	Not Applicable
e. RAS	
Safety Injection System Sump Recirculation	Not Applicable
f. EFAS	
Emergency Feedwater Pumps	Not Applicable

TABLE 3.3-5 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES

INITIATING SIGNAL AND FUNCTION		RESPONSE TIME IN SECONDS
2.	Pressurizer Pressure-Low	
a.	Safety Injection (ECCS)	
	(1) High Pressure Safety Injection	≤ 30.0*/18.5**
	(2) Low Pressure Safety Injection	≤ 45.5*/34.0**
b.	Containment Isolation	≤ 23.5*/12.0**
c.	Containment Cooling	≤ 31.0*/19.5**
3.	Containment Pressure-High	
a.	Safety Injection (ECCS)	
	(1) High Pressure Safety Injection	≤ 30.0*/18.5**
	(2) Low Pressure Safety Injection	≤ 45.5*/34.0**
b.	Containment Isolation	≤ 23.5*/12.0**
c.	Main Steam Isolation	≤ 5.0*/5.0**
d.	Main Feedwater Isolation	≤ 6.0*/6.0**
e.	Containment Cooling	≤ 31.0*/19.5**
4.	Containment Pressure--High-High	
a.	Containment Spray Pump	≤ 15.2*/2.7**
b.	Containment Spray Valves	≤ 11.0*/11.0**
c.	CCW to RCP Valves	≤ 23.5*/12.0**
5.	Containment Area Radiation-High #	
	Containment Purge Valves Isolation	≤ 6.2*/6.2**
6.	Steam Generator Pressure-Low	
a.	Main Steam Isolation	≤ 4.0*/4.0**
b.	Main Feedwater Isolation	≤ 6.0*/6.0**
7.	Refueling Water Storage Pool-Low	
	Containment Sump Recirculation	≤ 120.0*/108.5**
8.	4.16 kV Emergency Bus Undervoltage (Loss of Voltage)	
	Loss of Power (0 volts)	≤ 2***
9.	480V Emergency Bus Undervoltage (Loss of Voltage)	
	Loss of Power (0 volts)	N.A.
10.	4.16 kV Emergency Bus Undervoltage (Degraded Voltage)	
	Loss of Power	≤ 14***

TABLE 3.3-5 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES

INITIATING SIGNAL AND FUNCTION		RESPONSE TIME IN SECONDS
11.	Steam Generator Level Low	
	Emergency Feedwater Pump and Block Valves	≤ 54.0*/42.0**
12.	Wide Range Steam Generator Level Low	
	Emergency Feedwater Control Valves	≤ 25.0*/25.0**
NOTE:	Response time for all Motor Driven and Steam Driven Emergency Feedwater Pumps on all ESF signal starts.	≤ 54.0

TABLE NOTATIONS

*Diesel generator starting and sequence loading delays included. Response time limit includes movement of valves and attainment of pump or blower discharge pressure.

**Diesel generator starting and sequence loading delays not included. Offsite power available. Response time limit includes movement of valves and attainment of pump or blower discharge pressure.

***Response time measured from the sensing relay to the channel output only.

#Response time does not include the detector.

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