

ATTACHMENT 2 TO AEP:NRC:1210

EXISTING TECHNICAL SPECIFICATION
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3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1.1 As a minimum, the reactor trip system instrumentation channels and interlocks 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

4.3.1.1.1 Each reactor trip system 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.

4.3.1.1.2 The logic for the interlocks shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock 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 logic train such that both logic trains are tested at least once per 36 months and 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. *

* 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.

TABLE 3.3-2

~~REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIMES~~

<u>FUNCTIONAL UNIT</u>	<u>RESPONSE TIME</u>
1. Manual Reactor Trip	NOT APPLICABLE
2. Power Range, Neutron Flux (High and Low Setpoint)	Less than or equal to 0.5 seconds*
3. Power Range, Neutron Flux, High Positive Rate	NOT APPLICABLE
4. Power Range, Neutron Flux, High Negative Rate	Less than or equal to 0.5 seconds*
5. Intermediate Range, Neutron Flux	NOT APPLICABLE
6. Source Range, Neutron Flux	NOT APPLICABLE
7. Overtemperature delta T	Less than or equal to 6.0 seconds*
8. Overpower delta T	Less than or equal to 6.0 seconds*
9. Pressurizer Pressure--Low	Less than or equal to 1.0 seconds
10. Pressurizer Pressure--High	Less than or equal to 1.0 seconds
11. Pressurizer Water Level--High	Less than or equal to 2.0 seconds

Table intentionally
deleted

* 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.

TABLE 3.3-2 (Continued)

~~REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIMES~~

<u>FUNCTIONAL UNIT</u>	<i>Table intentionally deleted.</i>	<u>RESPONSE TIME</u>
12. Loss of Flow - Single Loop (Above P-8)		Less than or equal to 1.0 seconds
13. Loss of Flow - Two Loops (Above P-7 and Below P-8)		Less than or equal to 1.0 seconds
14. Steam Generator Water Level--Low-Low		Less than or equal to 1.5 seconds
15. Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level		NOT APPLICABLE
16. Undervoltage-Reactor Coolant Pumps		Less than or equal to 1.2 seconds
17. Underfrequency-Reactor Coolant Pumps		Less than or equal to 0.6 seconds
18. Turbine Trip		
A. Low Fluid Oil Pressure		NOT APPLICABLE
B. Turbine Stop Valve		NOT APPLICABLE
19. Safety Injection Input from ESF		NOT APPLICABLE
20. Reactor Coolant Pump Breaker Position Trip		NOT APPLICABLE

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 interlocks 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

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

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock 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 logic train such that both logic trains are tested at least once per 36 months and one channel per function such that all channels are tested at least once per 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 FUNCTIONRESPONSE TIME IN SECONDS1. Manual*Table
intentionally
deleted*

- | | |
|---|----------------|
| a. Safety Injection (ECCS) | Not Applicable |
| Feedwater Isolation | Not Applicable |
| Reactor Trip (SI) | Not Applicable |
| Containment Isolation-Phase "A" | Not Applicable |
| Containment Purge and Exhaust Isolation | Not Applicable |
| Auxiliary Feedwater Pumps | Not Applicable |
| Essential Service Water System | Not Applicable |
| b. Containment Spray | Not Applicable |
| Containment Isolation-Phase "B" | Not Applicable |
| Containment Purge and Exhaust Isolation | Not Applicable |
| Containment Air Recirculation Fan | Not Applicable |
| c. Containment Isolation-Phase "A" | Not Applicable |
| Containment Purge and Exhaust Isolation | Not Applicable |
| d. Steam Line Isolation | Not Applicable |

2. Containment Pressure-High

- | | |
|--|---------------------------------------|
| a. Safety Injection (ECCS) | Less than or equal to
27.0@/27.0++ |
| b. Reactor Trip (From SI) | Less than or equal to 3.0 |
| c. Feedwater Isolation | Less than or equal to 8.0 |
| d. Containment Isolation-Phase "A" | Less than or equal to
18.0@/28.0@ |
| e. Containment Purge and Exhaust Isolation | Not Applicable |
| f. Auxiliary Feedwater Pumps | Not Applicable |
| g. Essential Service Water System | Less than or equal to
13.0@/48.0@ |

TABLE 3.3-5 (Continued)

~~ENGINEERED SAFETY FEATURES REFERENCE TIMES~~INITIATING SIGNAL AND FUNCTIONRESPONSE TIME IN SECONDS3. Pressurizer Pressure-LowTable
intentionally
deleted

- | | |
|--|-------------------------------------|
| a. Safety Injection (ECCS) | Less than or equal to 27.000/27.0++ |
| b. Reactor Trip (from SI) | Less than or equal to 3.0 |
| c. Feedwater Isolation | Less than or equal to 8.0 |
| d. Containment Isolation-Phase "A" | Less than or equal to 18.0# |
| e. Containment Purge and Exhaust Isolation | Not Applicable |
| f. Auxiliary Feedwater Pumps | Not Applicable |
| g. Essential Service Water System | Less than or equal to 48.0++/13.0# |

4. Differential Pressure Between Steam Lines-High

- | | |
|--|------------------------------------|
| a. Safety Injection (ECCS) | Less than or equal to 27.000/37.00 |
| b. Reactor Trip (from SI) | Less than or equal to 3.0 |
| c. Feedwater Isolation | Less than or equal to 8.0 |
| d. Containment Isolation-Phase "A" | Less than or equal to 18.0#/28.0## |
| e. Containment Purge and Exhaust Isolation | Not Applicable |
| f. Auxiliary Feedwater Pumps | Not Applicable |
| g. Essential Service Water System | Less than or equal to 13.0#/48.0## |

5. Steam Flow in Two Steam Lines - High Coincident with Tavg--Low-Low

- | | |
|--|------------------------------------|
| a. Safety Injection (ECCS) | Less than or equal to 29.000/39.00 |
| b. Reactor Trip (from SI) | Less than or equal to 5.0 |
| c. Feedwater Isolation | Less than or equal to 10.0 |
| d. Containment Isolation-Phase "A" | Less than or equal to 20.0#/30.0## |
| e. Containment Purge and Exhaust Isolation | Not Applicable |
| f. Auxiliary Feedwater Pumps | Not Applicable |
| g. Essential Service Water System | Less than or equal to 15.0#/50.0## |
| h. Steam Line Isolation | Less than or equal to 13.0 |

TABLE 3.3-5 (Continued)

~~ENGINEERED SAFETY FEATURES RESPONSE TIMES~~

Table intentionally deleted

INITIATING SIGNAL AND FUNCTIONRESPONSE TIME IN SECONDS6. Steam Flow in Two Steam Lines-High
Coincident With Steam Line Pressure-Low

- | | |
|--|---------------------------------------|
| a. Safety Injection (ECCS) | Less than or equal to
27.000/37.00 |
| b. Reactor Trip (from SI) | Less than or equal to 3.0 |
| c. Feedwater Isolation | Less than or equal to 8.0 |
| d. Containment Isolation-Phase "A" | Less than or equal to
18.00/28.00 |
| e. Containment Purge and Exhaust Isolation | Not Applicable |
| f. Auxiliary Feedwater Pumps | Not Applicable |
| g. Essential Service Water System | Less than or equal to
14.00/48.00 |
| h. Steam Line Isolation | Less than or equal to 11.0 |

7. Containment Pressure--High-High

- | | |
|--------------------------------------|-----------------------------|
| a. Containment Spray | Less than or equal to 45.0 |
| b. Containment Isolation-Phase "B" | Not Applicable |
| c. Steam Line Isolation | Less than or equal to 10.0 |
| d. Containment Air Recirculation Fan | Less than or equal to 600.0 |

8. Steam Generator Water Level--High-High

- | | |
|------------------------|----------------------------|
| a. Turbine Trip | Less than or equal to 2.5 |
| b. Feedwater Isolation | Less than or equal to 11.0 |

9. Steam Generator Water Level--Low-Low

- | | |
|---|----------------------------|
| a. Motor Driven Auxiliary Feedwater Pumps | Less than or equal to 60.0 |
| b. Turbine Driven Auxiliary Feedwater Pumps | Less than or equal to 60.0 |

10. 4160 volt Emergency Bus Loss of Voltage

- | | |
|---|----------------------------|
| a. Motor Driven Auxiliary Feedwater Pumps | Less than or equal to 60.0 |
|---|----------------------------|

11. Loss of Main Feedwater Pumps

- | | |
|---|----------------------------|
| a. Motor Driven Auxiliary Feedwater Pumps | Less than or equal to 60.0 |
|---|----------------------------|

12. Reactor Coolant Pump Bus Undervoltage

- | | |
|---|----------------------------|
| a. Turbine Driven Auxiliary Feedwater Pumps | Less than or equal to 60.0 |
|---|----------------------------|

TABLE 3.3-5 (Continued)

Table intentionally deleted

TABLE NOTATION

- * Diesel generator starting and sequence loading delays not included. Offsite power available. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps.
- ** Diesel generator starting and sequence loading delays included. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps.
- ++ Diesel generator starting and sequence loading delays included. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging, SI, and RHR pumps. Sequential transfer of charging pump suction from the VCT to the RWST (RWST valves open, then VCT valves close) is NOT included.
- @ Diesel generator starting and sequence loading delays included. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps. Sequential transfer of charging pump suction from the VCT to the RWST (RWST valves open, then VCT valves close) is included.
- @@ Diesel generator starting and sequence loading delays NOT included. Offsite power available. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps. Sequential transfer of charging pump suction from the VCT to the RWST (RWST valves open, then VCT valves close) is included.

LIMITING SAFETY SYSTEM SETTINGS

BASES

Undervoltage and Underfrequency - Reactor Coolant Pump Busses

The Undervoltage and Underfrequency Reactor Coolant Pump bus trips provide reactor core protection against DNB as a result of loss of voltage or underfrequency to more than one reactor coolant pump. The specified set points assure a reactor trip signal is generated before the low flow trip set point is reached. A ~~0.1 second~~ time delay is incorporated in each of these trips to prevent spurious reactor trips from momentary electrical power transients.

Turbine Trip

A Turbine Trip causes a direct reactor trip when operating above P-7. Each of the turbine trips provide turbine protection and reduce the severity of the ensuing transient. No credit was taken in the accident analyses for operation of these trips. Their functional capability at the specified trip settings is required to enhance the overall reliability of the Reactor Protection System.

Safety Injection Input from ESF

If a reactor trip has not already been generated by the reactor protective instrumentation, the ESF automatic actuation logic channels will initiate a reactor trip upon any signal which initiates a safety injection. This trip is provided to protect the core in the event of a LOCA. The ESF instrumentation channels which initiate a safety injection signal are shown in Table 3.3-3.

Reactor Coolant Pump Breaker Position Trip

The Reactor Coolant Pump Breaker Position Trip is an anticipatory trip which provides reactor core protection against DNB resulting from the opening of two or more pump breakers above P-7. This trip is blocked below P-7. The open/close position trip assures a reactor trip signal is generated before the low flow trip setpoint is reached. No credit was taken in the accident analyses for operation of this trip. The functional capability at the open/close position settings is required to enhance the overall reliability of the Reactor Protection System.

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 interlocks 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, redundancy 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.

~~ESF response times specified in Table 3.3-5 which include sequential operation of the RWST and VCT valves (Notes @ and @@) are based on values assumed in the non-LOCA safety analyses. These analyses take credit for injection of borated water from the RWST. Injection of borated water is assumed not to occur until the VCT charging pump suction valves are closed following opening of the RWST charging pump suction valves. When sequential operation of the RWST and VCT valves is not included in the response times (Note ++), the values specified are based on the LOCA analyses. The LOCA analyses take credit for injection flow regardless of the source. Verification of the response times specified in Table 3.3-5 will assure that the assumption used for VCT and RWST valves are valid.~~

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1.1 As a minimum, the reactor trip system instrumentation channels and interlocks 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

4.3.1.1.1 Each reactor trip system 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 interlocks shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock 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 logic train such that both logic trains are tested at least once per 36 months and 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.† *

* 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.

† The provisions of Technical Specification 4.0.8 are applicable.

TABLE 3.3-2

~~REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIMES~~

<u>FUNCTIONAL UNIT</u>	<u>RESPONSE TIME</u>
1. Manual Reactor Trip	NOT APPLICABLE
2. Power Range, Neutron Flux (High and Low Setpoint)	Less than or equal to 0.5 seconds*
3. Power Range, Neutron Flux, High Positive Rate	NOT APPLICABLE
4. Power Range, Neutron Flux High Negative Rate	Less than or equal to 0.5 seconds*
5. Intermediate Range, Neutron Flux	NOT APPLICABLE
6. Source Range, Neutron Flux	NOT APPLICABLE
7. Overtemperature Delta T	Less than or equal to 6.0 seconds*
8. Overpower Delta T	Less than or equal to 6.0 seconds*
9. Pressurizer Pressure--Low	Less than or equal to 2.0 seconds
10. Pressurizer Pressure--High	Less than or equal to 2.0 seconds
11. Pressurizer Water Level--High	Less than or equal to 2.0 seconds

*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.

TABLE 3.3-2 (Continued)

~~REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIMES~~

Table intentionally deleted

<u>FUNCTIONAL UNIT</u>	<u>RESPONSE TIME</u>
12. Loss of Flow - Single Loop (Above P-8)	Less than or equal to 1.0 seconds
13. Loss of Flow - Two Loops (Above P-7 and below P-8)	Less than or equal to 1.0 seconds
14. Steam Generator Water Level--Low-Low	Less than or equal to 2.0 seconds
15. Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level	NOT APPLICABLE
16. Undervoltage-Reactor Coolant Pumps	Less than or equal to 1.5 seconds
17. Underfrequency-Reactor Coolant Pumps	Less than or equal to 0.6 seconds
18. Turbine Trip	
A. Low Fluid Oil Pressure	NOT APPLICABLE
B. Turbine Stop Valve	NOT APPLICABLE
19. Safety Injection Input from ESF	NOT APPLICABLE
20. Reactor Coolant Pump Breaker Position Trip	NOT APPLICABLE

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 interlocks 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

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

4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock 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 logic train such that both logic trains are tested at least once per 36 months and one channel per function such that all channels are tested at least once per 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.†

† The provisions of Technical Specification 4.0.8 are applicable.

TABLE 3.3-5

~~ENGINEERED SAFETY FEATURES RESPONSE TIMES~~

*Table intentionally
deleted*

INITIATING SIGNAL AND FUNCTIONRESPONSE TIME IN SECONDS1. Manual

- | | |
|---|----------------|
| a. Safety Injection (ECCS) | Not Applicable |
| Feedwater Isolation | Not Applicable |
| Reactor Trip (SI) | Not Applicable |
| Containment Isolation-Phase "A" | Not Applicable |
| Containment Purge and Exhaust Isolation | Not Applicable |
| Auxiliary Feedwater Pumps | Not Applicable |
| Essential Service Water System | Not Applicable |
| b. Containment Spray | Not Applicable |
| Containment Isolation-Phase "B" | Not Applicable |
| Containment Purge and Exhaust Isolation | Not Applicable |
| Containment Air Recirculation Fan | Not Applicable |
| c. Containment Isolation-Phase "A" | Not Applicable |
| Containment Purge and Exhaust Isolation | Not Applicable |
| d. Steam Line Isolation | Not Applicable |

2. Containment Pressure-High

- | | |
|--|--|
| a. Safety Injection (ECCS) | Less than or equal to
27.0@@/27.0++ |
| b. Reactor Trip (from SI) | Less than or equal to 3.0 |
| c. Feedwater Isolation | Less than or equal to 8.0 |
| d. Containment Isolation-Phase "A" | Not Applicable |
| e. Containment Purge and Exhaust Isolation | Not Applicable |
| f. Auxiliary Feedwater Pumps | Not Applicable |
| g. Essential Service Water System | Not Applicable |

TABLE 3.3-5 (Continued)

~~ENGINEERED SAFETY FEATURES RESPONSE TIMES~~INITIATING SIGNAL AND FUNCTIONRESPONSE TIME IN SECONDS3. Pressurizer Pressure-LowTable
intentionally
deleted

- | | |
|---|--|
| a. Safety Injection (ECCS) | Less than or equal to
27.0@@/27.0++ |
| b. Reactor Trip (from SI) | Less than or equal to 3.0 |
| c. Feedwater Isolation | Less than or equal to 8.0 |
| d. Containment Isolation - Phase "A" | Less than or equal to 18.0# |
| e. Containment Purge and Exhaust
Isolation | Not Applicable |
| f. Motor Driven Auxiliary Feedwater
Pumps | Less than or equal to 60.0 |
| g. Essential Service Water System | Less than or equal to
48.0++/13.0# |

4. Differential Pressure Between Steam Lines - High

- | | |
|---|---------------------------------------|
| a. Safety Injection (ECCS) | Less than or equal to
27.0@@/37.0@ |
| b. Reactor Trip (from SI) | Less than or equal to 3.0 |
| c. Feedwater Isolation | Less than or equal to 8.0 |
| d. Containment Isolation - Phase "A" | Less than or equal to
18.0#/28.0## |
| e. Containment Purge and Exhaust
Isolation | Not Applicable |
| f. Motor Driven Auxiliary Feedwater
Pumps | Less than or equal to 60.0 |
| g. Essential Service Water System | Less than or equal to
13.0#/48.0## |

5. Steam Flow in Two Steam Lines - High Coincident
with Tavg--Low-Low

- | | |
|---|----------------------------|
| a. Safety Injection (ECCS) | Not Applicable |
| b. Reactor Trip (from SI) | Not Applicable |
| c. Feedwater Isolation | Not Applicable |
| d. Containment Isolation-Phase "A" | Not Applicable |
| e. Containment Purge and Exhaust
Isolation | Not Applicable |
| f. Auxiliary Feedwater Pumps | Not Applicable |
| g. Essential Service Water System | Not Applicable |
| h. Steam Line Isolation | Less than or equal to 13.0 |

TABLE 3.3-5 (Continued)
ENGINEERED SAFETY FEATURES RESPONSE TIMES

<u>INITIATING SIGNAL AND FUNCTION</u>	<u>RESPONSE TIME IN SECONDS</u>
6. <u>Steam Line Pressure--Low</u>	
a. Safety Injection (ECCS)	Less than or equal to 27.0@/37.0@
b. Reactor Trip (from SI)	Less than or equal to 3.0
c. Feedwater Isolation	Less than or equal to 8.0
d. Containment Isolation-Phase "A"	Less than or equal to 18.0#/28.0##
e. Containment Purge and Exhaust Isolation	Not Applicable
f. Motor Driven Auxiliary Feedwater Pumps	Less than or equal to 60.0
g. Essential Service Water System	Less than or equal to 14.0#/48.0##
h. Steam Line Isolation	Less than or equal to 11.0
7. <u>Containment Pressure--High-High</u>	
a. Containment Spray	Less than or equal to 45.0
b. Containment Isolation-Phase "B"	Not Applicable
c. Steam Line Isolation	Less than or equal to 10.0
d. Containment Air Recirculation Fan	Less than or equal to 600.0
8. <u>Steam Generator Water Level--High-High</u>	
a. Turbine Trip	Less than or equal to 2.5
b. Feedwater Isolation	Less than or equal to 11.0
9. <u>Steam Generator Water Level--Low-Low</u>	
a. Motor Driven Auxiliary Feedwater Pumps	Less than or equal to 60.0
b. Turbine Driven Auxiliary Feedwater Pumps	Less than or equal to 60.0
10. <u>4160 volt Emergency Bus Loss of Voltage</u>	
a. Motor Driven Auxiliary Feedwater Pumps	Less than or equal to 60.0
11. <u>Loss of Main Feedwater Pumps</u>	
a. Motor Driven Auxiliary Feedwater Pumps	Less than or equal to 60.0
12. <u>Reactor Coolant Pump Bus Undervoltage</u>	
a. Turbine Driven Auxiliary Feedwater Pumps	Less than or equal to 60.0

Table intentionally deleted

TABLE 3.3-5 (Continued)

Table intentionally deleted

TABLE NOTATION

- # Diesel generator starting and sequence loading delays not included. Offsite power available. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps.
- ## Diesel generator starting and sequence loading delays included. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps.
- ++ Diesel generator starting and sequence loading delays included. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging, SI, and RHR pumps. Sequential transfer of charging pump suction from the VCT to the RWST (RWST valves open, then VCT valves close) is NOT included.
- @ Diesel generator starting and sequence loading delays included. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps. Sequential transfer of charging pump suction from the VCT to the RWST (RWST valves open, then VCT valves close) is included.
- @@ Diesel generator starting and sequence loading delays NOT included. Offsite power available. Response time limit includes opening of valves to establish SI path and attainment of discharge pressure for centrifugal charging pumps. Sequential transfer of charging pump suction from the VCT to the RWST (RWST valves open, then VCT valves close) is included.

LIMITING SAFETY SYSTEM SETTINGS

BASES

Undervoltage and Underfrequency - Reactor Coolant Pump Busses

The Undervoltage and Underfrequency Reactor Coolant Pump bus trips provide reactor core protection against DNB as a result of loss of voltage or underfrequency to more than one reactor coolant pump. The specified set points assure a reactor trip signal is generated before the low flow trip set point is reached. Time delays are incorporated in the underfrequency and undervoltage trips to prevent spurious reactor trips from momentary electrical power transients. For undervoltage, the delay is set so that the time required for a signal to reach the reactor trip breakers following the simultaneous trip of two or more reactor coolant pump bus circuit breakers shall not exceed 1.2 seconds. For underfrequency, the delay is set so that the time required for a signal to reach the reactor trip breakers after the underfrequency trip set point is reached shall not exceed 0.3 seconds. The total response times for these functional units include an additional 0.3 seconds for trip breaker operation and CRDM release.

Turbine Trip

A Turbine Trip causes a direct reactor trip when operating above P-7. Each of the turbine trips provide turbine protection and reduce the severity of the ensuing transient. No credit was taken in the accident analyses for operation of these trips. Their functional capability at the specified trip settings is required to enhance the overall reliability of the Reactor Protection System.

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 interlocks 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 proposes from diverse parameters.

The OPERABILITY of these system 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 system is consistent with the assumptions used in the accident analyses.

Protection has been provided for main feedwater system malfunctions in MODES 3 and 4. This protection is required when main feedpumps are aligned to feed steam generators in MODES 3 and 4. The availability of feedwater isolation on high-high steam generator level terminates the addition of cold water to the steam generators in any main feedwater system malfunction. The total volume that can be added to the steam generators by the main feedwater system in MODES 3 and 4 is limited by this safeguards actuation and the fact that feedwater isolation on low T_{avg} setpoint coincident with reactor trip can only be cleared above the low-low steam generator level trip setpoint.

The restrictions associated with bypassing ESF trip functions below either P-11 or P-12 provide protection against an increase in steam flow transient and are consistent with assumptions made in the safety analysis.

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.

INSTRUMENTATION (Continued)

BASES

ESF response times specified in Table 3.3-5 which include sequential operation of the RWST and VCT valves (Notes @ and @@) are based on values assumed in the non-LOCA safety analyses. These analyses take credit for injection of borated water from the RWST. Injection of borated water is assumed not to occur until the VCT charging pump suction valves are closed following opening of the RWST charging pump suction valves. When sequential operation of the RWST and VCT valves is not included in the response times (Note ++), the values specified are based on the LOCA analyses. The LOCA analyses take credit for injection flow regardless of the source. Verification of the response times specified in Table 3.3-5 will assure that the assumption used for VCT and RWST valves are valid.

3/4.3.3 MONITORING INSTRUMENTATION

3/4.3.3.1 RADIATION MONITORING INSTRUMENTATION

Noble gas effluent monitors provide information, during and following an accident, which is considered helpful to the operator in assessing the plant condition. It is desired that these monitors be OPERABLE at all times during plant operation, but they are not required for safe shutdown of the plant.

In addition, a minimum of two in containment radiation-level monitors with a maximum range of 10^7 R/hr for photon only should be OPERABLE at all times except for cold shutdown and refueling outages. In case of failure of the monitor, appropriate actions should be taken to restore its operational capability as soon as possible.

Table 3.3-6 is based on the following Alarm/Trip Setpoints and Measurement Ranges for each instrument listed. For the unit vent noble gas monitors, it should be noted that there is an automatic switchover from the low/mid-range channels to the high-range channel when the upper limits of the low- and mid-range channel measurement ranges are reached. In this case there is no flow to the low- and mid-range channels from the unit vent sample line. This is considered to represent proper operation of this monitor. Therefore, if automatic switchover to the high-range should occur, and the low- and mid-range detectors are capable of functioning when flow is re-established, the low- and mid-range channels should not be declared inoperable and the ACTION statement in the Technical Specification does not apply. This is also true while purging the low- and mid-range chambers following a large activity excursion prior to resumption of low-level monitoring and establishment of a new background.

ATTACHMENT 3 TO AEP:NRC:1210

PROPOSED REVISED
TECHNICAL SPECIFICATION PAGES

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

- 3.3.1.1 As a minimum, the reactor trip system instrumentation channels and interlocks 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 trip system 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.
- 4.3.1.1.2 The logic for the interlocks shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock 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 logic train such that both logic trains are tested at least once per 36 months and 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.*

* 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.

TABLE 3.3-2

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.3 INSTRUMENTATION

TABLE 3.3-2 (Continued)

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3/4 **LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS**
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 interlocks 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, CHANNEL FUNCTIONAL TEST and TRIP ACTUATING DEVICE OPERATIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2.
- 4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock 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 logic train such that both logic trains are tested at least once per 36 months and one channel per function such that all channels are tested at least once per 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.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.3 INSTRUMENTATION

TABLE 3.3-5

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3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.3 INSTRUMENTATION

TABLE 3.3-5 (Continued)

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TABLE 3.3-5 (Continued)

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3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.3 INSTRUMENTATION

TABLE 3.3-5 (Continued)

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BASES

2.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

LIMITING SAFETY SYSTEM SETTINGS

BASES

Undervoltage and Underfrequency - Reactor Coolant Pump Busses

The Undervoltage and Underfrequency Reactor Coolant Pump bus trips provide reactor core protection against DNB as a result of loss of voltage or underfrequency to more than one reactor coolant pump. The specified set points assure a reactor trip signal is generated before the low flow trip set point is reached. A time delay is incorporated in each of these trips to prevent spurious reactor trips from momentary electrical power transients.

Turbine Trip

A Turbine Trip causes a direct reactor trip when operating above P-7. Each of the turbine trips provide turbine protection and reduce the severity of the ensuing transient. No credit was taken in the accident analyses for operation of these trips. Their functional capability at the specified trip settings is required to enhance the overall reliability of the Reactor Protection System.

Safety Injection Input from ESF

If a reactor trip has not already been generated by the reactor protective instrumentation, the ESF automatic actuation logic channels will initiate a reactor trip upon any signal which initiates a safety injection. This trip is provided to protect the core in the event of a LOCA. The ESF instrumentation channels which initiate a safety injection signal are shown in Table 3.3-3.

Reactor Coolant Pump Breaker Position Trip

The Reactor Coolant Pump Breaker Position Trip is an anticipatory trip which provides reactor core protection against DNB resulting from the opening of two or more pump breakers above P-7. This trip is blocked below P-7. The open/close position trip assures a reactor trip signal is generated before the low flow trip setpoint is reached. No credit was taken in the accident analyses for operation of this trip. The functional capability at the open/close position settings is required to enhance the overall reliability of the Reactor Protection System.

3/4 BASES
3/4.3 INSTRUMENTATION

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 interlocks 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, redundancy 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.

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.

3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

- 3.3.1.1 As a minimum, the reactor trip system instrumentation channels and interlocks 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 trip system 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.
- 4.3.1.1.2 The logic for the interlocks shall be demonstrated OPERABLE prior to each reactor startup unless performed during the preceding 92 days. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock 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 logic train such that both logic trains are tested at least once per 36 months and 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.*

* 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.



TABLE 3.3-2

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3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.3 INSTRUMENTATION

TABLE 3.3-2 (Continued)

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3/4 **LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS**
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 interlocks 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, CHANNEL FUNCTIONAL TEST and TRIP ACTUATING DEVICE OPERATIONAL TEST operations for the MODES and at the frequencies shown in Table 4.3-2.
- 4.3.2.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the automatic actuation logic test. The total interlock function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by interlock 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 logic train such that both logic trains are tested at least once per 36 months and one channel per function such that all channels are tested at least once per 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

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TABLE 3.3-5 (Continued)

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TABLE 3.3-5 (Continued)

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3/4 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS
3/4.3 INSTRUMENTATION

TABLE 3.3-5 (Continued)

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BASES

2.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

2.2.1 REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS (Continued)

Undervoltage and Underfrequency - Reactor Coolant Pump Busses

The Undervoltage and Underfrequency Reactor Coolant Pump bus trips provide reactor core protection against DNB as a result of loss of voltage or underfrequency to more than one reactor coolant pump. The specified set points assure a reactor trip signal is generated before the low flow trip set point is reached. Time delays are incorporated in the underfrequency and undervoltage trips to prevent spurious reactor trips from momentary electrical power transients.

Turbine Trip

A Turbine Trip causes a direct reactor trip when operating above P-7. Each of the turbine trips provide turbine protection and reduce the severity of the ensuing transient. No credit was taken in the accident analyses for operation of these trips. Their functional capability at the specified trip settings is required to enhance the overall reliability of the Reactor Protection System.

3/4 BASES
3/4.3 INSTRUMENTATION

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 interlocks 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 system is required to provide the overall reliability, redundancy 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 system is consistent with the assumptions used in the accident analyses.

Protection has been provided for main feedwater system malfunctions in MODES 3 and 4. This protection is required when main feedpumps are aligned to feed steam generators in MODES 3 and 4. The availability of feedwater isolation on high-high steam generator level terminates the addition of cold water to the steam generators in any main feedwater system malfunction. The total volume that can be added to the steam generators by the main feedwater system in MODES 3 and 4 is limited by this safeguards actuation and the fact that feedwater isolation on low T_{avg} setpoint coincident with reactor trip can only be cleared above the low-low steam generator level trip setpoint.

The restrictions associated with bypassing ESF trip functions below either P-11 or P-12 provide protection against an increase in steam flow transient and are consistent with assumptions made in the safety analysis.

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.

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.

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3/4.3.3 MONITORING INSTRUMENTATION

3/4.3.3.1 RADIATION MONITORING INSTRUMENTATION

Noble gas effluent monitors provide information, during and following an accident, which is considered helpful to the operator in assessing the plant condition. It is desired that these monitors be OPERABLE at all times during plant operation, but they are not required for safe shutdown of the plant.

In addition, a minimum of two in containment radiation-level monitors with a maximum range of 10^7 R/hr for photon only should be OPERABLE at all times except for cold shutdown and refueling outages. In case of failure of the monitor, appropriate actions should be taken to restore its operational capability as soon as possible.

Table 3.3-6 is based on the following Alarm/Trip Setpoints and Measurement Ranges for each instrument listed. For the unit vent noble gas monitors, it should be noted that there is an automatic switchover from the low/mid-range channels to the high-range channel when the upper limits of the low- and mid-range channel measurement ranges are reached. In this case there is no flow to the low- and mid-range channels from the unit vent sample line. This is considered to represent proper operation of this monitor. Therefore, if automatic switchover to the high-range should occur, and the low- and mid-range detectors are capable of functioning when flow is re-established, the low- and mid-range channels should not be declared inoperable and the ACTION statement in the Technical Specification does not apply. This is also true while purging the low- and mid-range chambers following a large activity excursion prior to resumption of low-level monitoring and establishment of a new background.

