2. (cont.)
C. (cont.)

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 106, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications except where otherwise stated in specific license conditions. 106 74

(3) Less than Four Loop Operation

The licensees shall not operate the reactor at power levels above P-7 (as defined in Table 3.3-1 of Specification 3.3.1 of Appendix A to this license) with less than (4) reactor coolant loops in operation until safety analyses for less than four loop operation have been submitted and approval for less than four loop operation at power levels above P-7 has been granted by the Commission by Amendment of this license.

(4) Report on Vibration Tests

The licensees shall submit within six (6) months from the date of this license a final report analyzing the results of the preoperational vibration tests of the reactor internals performed during hot functional testing at the Trojan Nuclear Plant.

(5) Replacement of Certain Relays

The licensees shall within six (6) months and five (5) days from the date of this license replace all those output relays of the Solid State Protection System and Auxiliary Safeguard Cabinets (except those relays which the licensees have shown to the satisfaction of the NRC Staff need not be replaced) with relays that satisfy the seismic qualification criteria for the Trojan Nuclear Plant, or the reactor shall be shutdown until these relays are replaced. 7

(6) Spent Fuel Pool Modification

The licensee is authorized to modify the spent fuel pool as described in the application dated August 1, 1983 and amended October 31, 1983. 88

Since spent fuel is now being stored in the spent fuel pool, upon commencement of work on either the existing

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LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

2.2 LIMITING SAFETY SYSTEM SETTINGS

REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS

2.2.1 The reactor trip system instrumentation setpoints shall be set consistent with the Trip Setpoint values shown in Table 2.2-1.

APPLICABILITY: As shown for each channel in Table 3.3-1.

ACTION:

With a reactor trip system instrumentation setpoint less conservative than the value shown in the Allowable Values column of Table 2.2-1, declare the channel inoperable and apply the applicable ACTION statement requirement of Specification 3.3.1 until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint Value.

2.2 LIMITING SAFETY SYSTEM SETTINGS

BASES

2.2.1 REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS

The Reactor Trip Setpoint Limits specified in Table 2.2-1 are the values at which the Reactor Trips are set for each parameter. The Trip Setpoints have been selected to ensure that the reactor core and reactor coolant system are prevented from exceeding their safety limits. Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that each Allowable Value is equal to or less than the drift allowance assumed for each trip in the safety analyses.

Manual Reactor Trip

The Manual Reactor Trip is a redundant channel to the automatic protective instrumentation channels and provides manual reactor trip capability.

Power Range, Neutron Flux

The Power Range, Neutron Flux channel high setpoint provides reactor core protection against reactivity excursions which are too rapid to be protected by temperature and pressure protective circuitry. The low set point provides redundant protection in the power range for a power excursion beginning from low power. The trip associated with the low setpoint may be manually bypassed when P-10 is active (two of the four power range channels indicate a power level of above approximately 10 percent of RATED THERMAL POWER) and is automatically reinstated when P-10 becomes inactive (three of the four channels indicate a power level below approximately 10 percent of RATED THERMAL POWER).

Power Range, Neutron Flux, High Positive Rate

The Power Range Positive Rate trip provides added protection against rapid flux increases which are characteristic of rod ejection events from any power level. Specifically, this trip complements the Power Range Neutron Flux High and Low trips to ensure that the criteria are met for rod ejection from partial power. No credit was taken for operation of this trip in the accident analyses; however, its functional capability at the specified trip setting is required by this specification to enhance the overall reliability of the Reactor Protection System.

Power Range, Neutron Flux, High Negative Rate

The Power Range Negative Rate trip provides protection to ensure that the minimum DNBR is maintained above the design DNBR value for multiple control rod drop accidents. The analysis of a single control rod drop accident indicates a return to full power may be initiated by the

automatic control system in response to a continued full power turbine load demand or by the negative moderator temperature feedback. This transient will not result in a calculated DNBR of less than the design DNBR value, therefore single rod drop protection is not required.

Intermediate and Source Range, Nuclear Flux

The Intermediate and Source Range, Nuclear Flux trips can provide reactor core protection during reactor startup. These trips provide added protection to the low setpoint trip of the Power Range, Neutron Flux channels. The Source Range Channels will initiate a reactor trip at about 10^{+5} counts per second unless manually blocked when P-6 becomes active. The Intermediate Range Channels will initiate a reactor trip at a current level proportional to approximately 25 percent of RATED THERMAL POWER unless manually blocked when P-10 becomes active. No credit was taken for operation of the trips associated with either the Intermediate or Source Range Channels in the accident analyses. However, their functional capability including the specified trip settings is required by this specification to enhance the overall reliability of the Reactor Protection System and to provide indication of core neutron flux to the operators during shutdown and startup conditions.

Overtemperature ΔT

The Overtemperature ΔT trip provides core protection to prevent DNB for all combinations of pressure, power, coolant temperature, and axial power distribution, provided that the transient is slow with respect to piping transit delays from the core to the temperature detectors (about 4 seconds), and pressure is within the range between the High and Low Pressure reactor trips. This setpoint includes corrections for changes in density and heat capacity of water with temperature and dynamic compensation for piping delays from the core to the loop temperature detectors. With normal axial power distribution, this reactor trip limit is always below the core safety limit as shown in Figure 2.1-1. If axial peaks are greater than design, as indicated by the difference between top and bottom power range nuclear detectors, the reactor trip is automatically reduced according to the notations in Table 2.2-1.

Operation with a reactor coolant loop out of service below the 4 loop P-8 setpoint does not require reactor protection system setpoint modification because the P-8 setpoint and associated trip will prevent DNB during 3 loop operation exclusive of the Overtemperature ΔT setpoint. Three loop operation above the 4 loop P-8 setpoint is permissible after resetting the K1, K2 and K3 inputs to the Overtemperature ΔT channels and raising the P-8 setpoint to its 3 loop value. In this mode of operation, the P-8 interlock and trip functions as a High Neutron Flux trip at the reduced power level.

LIMITING SAFETY SYSTEM SETTINGS

BASES

Overpower ΔT

The Overpower ΔT reactor trip provides assurance of fuel integrity, e.g., no melting, under all possible overpower conditions, limits the required range for Overtemperature ΔT protection, and provides a backup to the High Neutron Flux trip. The setpoint includes corrections for changes in density and heat capacity of water with temperature, and dynamic compensation for piping delays from the core to the loop temperature detectors. No credit was taken for operation of this trip in the accident analyses; however, its functional capability at the specified trip setting is required by this specification to enhance the overall reliability of the Reactor Protection System.

Pressurizer Pressure

The Pressurizer High and Low Pressure trips are provided to limit the pressure range in which reactor operation is permitted. The High Pressure trip is backed up by the pressurizer code safety valves for RCS overpressure protection, and is therefore set lower than the set pressure for these valves (2485 psig). The Low Pressure trip provides protection when above the P-7 interlock setpoint by tripping the reactor in the event of a loss of reactor coolant pressure.

Pressurizer Water Level

The Pressurizer High Water Level trip provides added protection against Reactor Coolant System overpressurization when above the P-7 interlock setpoint by limiting the water level to a volume sufficient to retain a steam bubble and preventing water relief through the pressurizer safety valves. No credit was taken for operation of this trip in the accident analyses; however, its functional capability at the specified trip setting is required by this specification to enhance the overall reliability of the Reactor Protection System.

Loss of Flow

The Loss of Flow trips provide core protection to prevent DNB in the event of a loss of one or more reactor coolant pumps.

Above approximately 10% (P-7) but below approximately 38% (P-8) of RATED THERMAL POWER, an automatic reactor trip will occur if the flow in any two loops drops below 90% of nominal full loop flow. Above approximately 38% (P-8) of RATED THERMAL POWER, an automatic reactor trip will occur if the flow in any single loop drops below 90% of nominal full

loop flow. This latter trip will prevent the minimum value of the DNBR from going below 1.73 during normal operational transients and anticipated transients when 3 loops are in operation and the Overtemperature ΔT trip setpoint is adjusted to the value specified for all loops in operation. With the Overtemperature ΔT trip setpoint adjusted to the value specified for 3 loop operation, the P-8 trip at 75% RATED THERMAL POWER will prevent the minimum value of the DNBR from going below 1.73 during normal operational transients and anticipated transients with 3 loops in operation.

Steam Generator Water Level

The Steam Generator Water Level Low-Low trip provides core protection by preventing operation with the steam generator water level below the minimum volume required for adequate heat removal capacity. The specified setpoint provides allowance that there will be sufficient water inventory in the steam generators at the time of trip to allow for starting delays of the auxiliary feedwater system.

Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level

The Steam/Feedwater Flow Mismatch in coincidence with a Steam Generator Low Water Level trip is not used in the transient and accident analyses but is included in Table 2.2-1 to ensure the functional capability of the specified trip settings and thereby enhance the overall reliability of the Reactor Protection System. This trip provides added protection to the Steam Generator Water Level Low-Low trip. The Steam/Feedwater Flow Mismatch portion of this trip is activated when the steam flow exceeds the feedwater flow by $\geq 1.51 \times 10^6$ lbs/hour. The Steam Generator Low Water level portion of the trip is activated when the water level drops below 25 percent, as indicated by the narrow range instrument. These trip values include sufficient allowance in excess of normal operating values to preclude spurious trips but will initiate a reactor trip before the steam generators are dry. Therefore, the required capacity and starting time requirements of the auxiliary feedwater pumps are reduced and the resulting thermal transient on the Reactor Coolant System and steam generators is minimized.

Undervoltage and Underfrequency - Reactor Coolant Pump Busses

The Undervoltage and Underfrequency Reactor Coolant Pump bus trips provide reactor core protection when above the P-7 interlock setpoint against DNB as a result of loss of voltage (nominally 12.47 kV) or

underfrequency (nominally 60 Hz) to more than one reactor coolant pump. The specified setpoints assure a reactor trip signal is generated before the low flow trip setpoint is reached. A 0.1 second time delay in the underfrequency trip and a 0.2 second time delay in the undervoltage trip are incorporated to prevent spurious reactor trips from momentary electrical power transients.

Turbine Trip

A Turbine Trip causes a direct reactor trip when operating above the P-7 interlock setpoint. 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.

Auto Safety Injection Input

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 included in Table 3.3-3.

Reactor Coolant Pump Breaker Position Trip

The Reactor Coolant Pump Breaker Position Trip is an anticipatory trip which provides additional reactor core protection against DNB resulting from the opening of two or more pump breakers when above the P-7 interlock setpoint. The open/close position trip assures a reactor trip signal is generated before the low flow trip set point 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 LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.0 APPLICABILITY

LIMITING CONDITION FOR OPERATION

3.0.1 Limiting Conditions for Operation and ACTION requirements shall be applicable during the OPERATIONAL MODES or other conditions specified for each specification.

3.0.2 Adherence to the requirements of the Limiting Condition for Operation and/or associated ACTION within the specified time interval shall constitute compliance with the specification. In the event the Limiting Condition for Operation is restored prior to expiration of the specified time interval, completion of the ACTION statement is not required.

3.0.3 In the event a Limiting Condition for Operation and/or associated ACTION requirements cannot be satisfied because of circumstances in excess of those addressed in the specification, within one hour action shall be initiated to place the unit in a MODE in which the Specification does not apply by placing it, as applicable, in:

1. At least HOT STANDBY within the next 6 hours,
2. At least HOT SHUTDOWN within the following 6 hours, and
3. At least COLD SHUTDOWN within the subsequent 24 hours.

Where corrective measures are completed that permit operation under the ACTION requirements, the ACTION may be taken in accordance with the specified time limits as measured from the time of failure to meet the Limiting Condition for Operation. Exceptions to these requirements are stated in the individual Specifications.

This Specification is not applicable in MODES 5 or 6.

3.0.4 Entry into an OPERATIONAL MODE or other specified applicability condition shall not be made unless the conditions of the Limiting Condition for Operation are met without reliance on provisions contained in the ACTION statements unless otherwise excepted. This provision shall not prevent passage through OPERATIONAL MODES as required to comply with ACTION statements.

3.0.5 When a system, subsystem, train, component or device is determined to be inoperable solely because its emergency power source is inoperable, or solely because its normal power source is inoperable, it may be considered OPERABLE for the purpose of satisfying the requirements of its applicable Limiting Condition for Operation, provided: (1) its corresponding normal or emergency power source is OPERABLE; and (2) all of its redundant system(s), subsystem(s), train(s), component(s) and device(s) are OPERABLE, or likewise satisfy the requirements of this specification. Unless both conditions (1) and (2) are satisfied, the unit shall be placed in at least HOT STANDBY within 1 hour, in at least HOT SHUTDOWN within the next 6 hours, and in at least COLD SHUTDOWN within the following 30 hours. This specification is not applicable in MODES 5 or 6.

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 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 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.

4.3.1.2 The logic for the interlocks shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by interlock operation. 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.

4.3.1.3 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.

TABLE 3.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	2	1	2	1, 2	11
	2	1	2	3*, 4*, 5*	10
2. Power Range, Neutron Flux					
A. High Setpoint	4	2	3	1, 2	2#
B. Low Setpoint	4	2	3	1###, 2	2#
3. Power Range, Neutron Flux High Positive Rate	4	2	3	1, 2	2#
4. Power Range, Neutron Flux, High Negative Rate	4	2	3	1, 2	2#
5. Intermediate Range, Neutron Flux	2	1	2	1###, 2	3
6. Source Range, Neutron Flux					
A. Startup	2	1	2	2##	4
B. Shutdown	2	1	2	3*, 4*, 5*	10
C. Shutdown	2	0	1	3, 4, 5	5
7. Overtemperature ΔT					
Four Loop Operation	4	2	3	1, 2	6#
Three Loop Operation	4	1**	3	1, 2	8
8. Overpower ΔT					
Four Loop Operation	4	2	3	1, 2	6#
Three Loop Operation	4	1**	3	1, 2	8
9. Pressurizer Pressure - Low	4	2	3	1Ψ	6#
10. Pressurizer Pressure - High	4	2	3	1, 2	6#
11. Pressurizer Water Level - High	3	2	2	1Ψ	7#

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
12. Loss of Flow - Single Loop (Above P-8)	3/loop	2/loop in any operating loop	2/loop in each operating loop	1	7#
13. Loss of Flow - Two loops (Above P-7 and below P-8)	3/loop	2/loop in two operating loops	2/loop in each operating loop	1	7#
14. Steam Generator Water Level - Low-Low	3/loop	2/loop in any operating loop	2/loop in each operating loop	1, 2	7#
15. Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level	2/loop-level and 2/loop-flow mismatch	1/loop-level coincident with 1/loop-flow mismatch in same loop	1/loop-level and 2/loop-flow mismatch or 2/loop-level and 1/loop-flow mismatch	1, 2	7#
16. Undervoltage - Reactor Coolant Pumps	4-2/bus	1/bus for each bus	1/bus	1Ψ	6#
17. Underfrequency - Reactor Coolant Pumps	4-2/bus	1/bus for each bus	1/bus	1Ψ	6#

TABLE 3.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
18. Turbine Trip					
A. Low Hydraulic Control Oil Pressure	3	2	2	1Ψ	7#
B. Turbine Stop Valve Closure	4-1/valve	4-1/valve	4-1/valve	1Ψ	7#
19. Auto Safety Injection Input	2	1	2	1, 2	1
20. Reactor Coolant Pump Breaker Position Trip	4-1/breaker	2	1/breaker per operating loop	1Ψ	9#
21. Reactor Trip Breakers	2	1	2	1, 2	1
	2	1	2	3*, 4*, 5*	10
22. Automatic Trip Logic	2	1	2	1, 2	1
	2	1	2	3*, 4*, 5*	10

TABLE 3.3-1 (Continued)

TABLE NOTATION

* With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal.

** The channel(s) associated with the protective functions derived from the out of service Reactor Coolant Loop shall be placed in the tripped condition.

The provisions of Specification 3.0.4 are not applicable.

When below the P-6 setpoint.

When below the P-10 setpoint.

ψ When above the P-7 setpoint.

ACTION STATEMENTS

ACTION 1 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours. One channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.1.1 provided the other channel is OPERABLE.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided all of the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours; however, the inoperable channel may be taken out of the tripped condition for up to 4 hours for troubleshooting and repair.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be taken out of the tripped condition for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.

c. Either THERMAL POWER is restricted to $\leq$75% of RATED THERMAL POWER and the Power Range Neutron Flux trip setpoint is reduced to $\leq$85% of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours, per Specification 4.2.4.c.

TABLE 3.3-1 (Continued)

ACTION 3 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 setpoint.

b. Above P-6, operation may continue, provided that THERMAL POWER is expeditiously placed within the range of the Source Range or Power Range Instrumentation.

ACTION 4 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, suspend all operations involving positive reactivity changes.

ACTION 5 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 within 1 hour and at least once per 12 hours thereafter.

ACTION 6 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided both of the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours; however, the inoperable channel may be taken out of the tripped condition for up to 4 hours for troubleshooting and repair.

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be taken out of the tripped condition for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.

ACTION 7 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may continue until performance of the next required CHANNEL FUNCTIONAL TEST provided the inoperable channel is placed in the tripped condition within 6 hours.

ACTION 8 - With a channel associated with an operating loop inoperable, restore the inoperable channel to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours. One channel associated with an operating loop may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.1.1.

TABLE 3.3-1 (Continued)

ACTION 9 - With less than the Minimum Number of Channels OPERABLE, operation may continue provided the inoperable channel is placed in the tripped condition within 6 hours.

ACTION 10 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or open the reactor trip breakers within 1 hour.

ACTION 11 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours.

REACTOR TRIP SYSTEM INTERLOCKS

DESIGNATION	CONDITION AND SETPOINT	FUNCTION
P-6	With 2 of 2 Intermediate Range Neutron Flux Channels $<6\times10^{-11}$ amps.	Prevents or defeats the manual block of source range reactor trip.
P-7	With 2 of 4 Power Range Neutron Flux Channels $\geq$11% of RATED THERMAL POWER or 1 of 2 Turbine impulse chamber pressure channels $\geq$66 psia.	Prevents or defeats the automatic block of reactor trip on: Low flow in more than one primary coolant loop, reactor coolant pump under-voltage and under-frequency, turbine trip, pressurizer low pressure, and pressurizer high level.
P-8	With 2 of 4 Power Range Neutron Flux Channels $\geq$39% of RATED THERMAL POWER.	Prevents or defeats the automatic block of reactor trip on low coolant flow in a single loop.
P-10	With 3 of 4 Power Range Neutron Flux Channels <9% of RATED THERMAL POWER.	Prevents or defeats the manual block of: Power range low setpoint reactor trip, intermediate range reactor trip, and intermediate range rod stops. Provides input to P-7.
P-13	With 2 of 2 Turbine Impulse Chamber Pressure Channels <66 psia.	Provides input to P-7.

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TABLE 3.3-2

REACTOR TRIP SYSTEM INSTRUMENTATION RESPONSE TIMES#

FUNCTIONAL UNIT	RESPONSE TIME
1. Power Range, Neutron Flux	≤0.5 seconds*
2. Power Range, Neutron Flux, High Negative Rate	≤0.5 seconds*
3. Overtemperature ΔT	≤4.0 seconds*
4. Pressurizer Pressure - Low	≤2.0 seconds
5. Pressurizer Pressure - High	≤2.0 seconds
6. Loss of Flow - Single Loop (Above P-8)	≤1.0 seconds
7. Loss of Flow - Two Loops (Above P-7 and below P-8)	≤1.0 seconds
8. Steam Generator Water Level - Low-Low	≤2.0 seconds
9. Undervoltage-Reactor Coolant Pumps	≤1.2 seconds
10. Underfrequency-Reactor Coolant Pumps	≤0.6 seconds

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

Trips are not listed for which response time testing is not applicable.

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
1. Manual Reactor Trip	N.A.	N.A.	R	1, 2, 3*, 4*, 5*
2. Power Range, Neutron Flux				
A. High Setpoint	S	D(2,4), M(3,4) Q(4,6)	Q	1, 2
B. Low Setpoint	S	R(4)	Q	1###, 2
3. Power Range, Neutron Flux, High Positive Rate	N.A.	R(4)	Q	1, 2
4. Power Range, Neutron Flux, High Negative Rate	N.A.	R(4)	Q	1, 2
5. Intermediate Range, Neutron Flux	S	R(4)#	S/U(1), Q	1###, 2
6. Source Range, Neutron Flux	S	R(4,5)	S/U(1), Q	2##, 3, 4, 5(9)
7. Overtemperature ΔT	S	R	Q	1, 2
8. Overpower ΔT	S	R	Q	1, 2
9. Pressurizer Pressure - Low	S	R	Q	1Ψ
10. Pressurizer Pressure - High	S	R	Q	1, 2
11. Pressurizer Water Level - High	S	R	Q	1Ψ
12. Loss of Flow - Single Loop	S	R	Q	1Ψ

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
13. Loss of Flow - Two Loops	S	R	N.A.	1Ψ
14. Steam Generator Water Level - Low-Low	S	R	Q	1, 2
15. Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level	S	R	Q	1, 2
16. Undervoltage - Reactor Coolant Pumps	N.A.	R	Q	1Ψ
17. Underfrequency - Reactor Coolant Pumps	N.A.	R	Q	1Ψ
18. Turbine Trip				
A. Low Hydraulic Control Oil Pressure	N.A	R	S/U(1,8)	1Ψ
B. Turbine Stop Valve Closure	N.A.	N.A.	S/U(1,8)	1Ψ
19. Auto Safety Injection Input	N.A.	N.A.	R	1, 2
20. Reactor Coolant Pump Breaker Position Trip	N.A.	N.A.	[illegible]	1Ψ
21. Reactor Trip Breaker	N.A.	N.A.	M(7, 10)	1, 2, 3*, 4*, 5*
22. Automatic Trip Logic	N.A.	N.A.	M(7)	1, 2, 3*, 4*, 5*

TABLE 4.3-1 (Continued)

NOTATION

* With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal.

\# The provisions of Specification 4.0.4 are not applicable.
\## When below the P-6 setpoint.
\### When below the P-10 setpoint.

ψ When above the P-7 setpoint.

(1) - If not performed in previous 31 days.

(2) - Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference is >2%.

(3) - Compare incore to excore axial imbalance above 15% of RATED THERMAL POWER. Recalibrate if absolute difference ≥3 percent.

(4) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

(5) - Detector plateau curves shall be obtained and evaluated.

(6) - Incore-Excore Calibration.

(7) - Each train tested every other month.

(8) - Setpoint verification is not applicable.

(9) - See Specification 3/4.9.2 for audio and visual requirements in MODE 6.

(10) - The reactor trip breakers shall be tested using the Automatic Trip Logic trip signal.

INSTRUMENTATION

3/4.3.2 ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 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 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.

4.3.2.2 The logic for the interlocks shall be demonstrated OPERABLE during the at power CHANNEL FUNCTIONAL TEST of channels affected by interlock operation. 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.

4.3.2.3 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 3.3-3

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. SAFETY INJECTION[Ψ]					
a. Actuation Logic	2	1	2	1, 2, 3, 4	13
b. Manual Initiation	2	1	2	1, 2, 3, 4	18
c. Containment Pressure - High	3	2	2	1, 2, 3, 4	14*
d. Pressurizer Pressure - Low	3	2	2	1, 2, 3#	14*
e. Differential Pressure Between Steam Lines - High				1, 2, 3##	
Four Loops Operating	3/steam line	2/steam line any steam line	2/steam line		14*
Three Loops Operating	3/operating steam line	1[###]/steam line, any operating steam line	2/operating steam line		15

Ψ Also initiates: Reactor Trip, Emergency Diesel Start, Auxiliary Feedwater, Turbine Trip, Feedwater Isolation, Containment Isolation, Containment Ventilation Isolation, Control Room Isolation, Containment Cooling Fans, and Essential Service Water.

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
f. Steam Flow in Two Steam Lines - High				1, 2, 3##	
Four Loops Operating	2/steam line	1/steam line any 2 steam lines	1/steam line		14*
Three Loops Operating	2/operating steam line	1###/any operating steam line	1/operating steam line		15
COINCIDENT WITH EITHER					
T_{avg} - Low-Low				1, 2, 3##	
Four Loops Operating	1 T_{avg}/loop	2 T_{avg} any loops	1 T_{avg} any 3 loops		14*
Three Loops Operating	1 T_{avg}/ operating loop	1### T_{avg} in any operating loop	1 T_{avg} in any two operating loops		15

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	
OR, COINCIDENT WITH						
Steam Line Pressure - Low				1, 2, 3###		
Four Loops Operating	1 pressure/ loop	2 pressures any loops	1 pressure any 3 loops		14*	|
Three Loops Operating	1 pressure/ operating loop	1### pressure in any operating loop	1 pressure in any 2 operating loops		15	
2. CONTAINMENT SPRAY						
a. Actuation Logic	2	1	2	1, 2, 3, 4	13	|
b. Manual	2	2	2	1, 2, 3, 4	18	|
c. Containment Pressure - High-High	4	2	3	1, 2, 3, 4	16	|
3. CONTAINMENT ISOLATION						
a. Containment Isolation Signal						—
1) Manual	2	1	2	1, 2, 3, 4	18	
2) From Safety Injection	See 1 above for initiating functions and requirements.					—

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	
b. Containment Ventilation Isolation						
1) From Manual Containment Isolation	See 3.a.1 above for requirements.					—
2) From Manual Containment Spray	See 2.b above for requirements.					—
3) From Safety Injection	See 1 above for initiating functions and requirements.					—
4) Containment Radioactivity - High						
Particulate	1	1	1	1, 2, 3, 4	17	
Iodine	1	1	1			
High Level Noble Gas	1	1	1			
Low Level Noble Gas	1	1	1			
4. STEAM LINE ISOLATION						
a. Actuation Logic	2	1	2	1, 2, 3	19	—
b. Manual	1/steam line	1/steam line	1/operating steam line	1, 2, 3	20	—
c. Containment Pressure -- High-High	4	2	3	1, 2, 3	16	

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
d. Steam Flow in Two Steam Lines - High				1, 2, 3	
Four Loops Operating	2/steam line	1/steam line any 2 lines	1/steam line		14*
Three Loops Operating	2/operating steam line	1###/any operating steam line	1/operating steam line		15
COINCIDENT WITH EITHER					
T_{avg} - Low-Low				1, 2, 3	
Four Loops Operating	1 T_{avg}/loop	1 T_{avg} any 2 loops	1 T_{avg} in any 3 loops		14*
Three Loops Operating	1 T_{avg}/operating loop	1### T_{avg} in any operating loop	1 T_{avg} in any two operating loops		15
OR, COINCIDENT WITH					
Steam Line Pressure - Low				1, 2, 3	
Four Loops Operating	1 pressure/loop	1 pressure any 2 loops	1 pressure any 3 loops		14*
Three Loops Operating	1 pressure/operating loop	1### pressure in any operating loop	1 pressure in any 2 operating loops		15

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
5. TURBINE TRIP AND FEEDWATER ISOLATION					
a. From Safety Injection	See 1 above for initiating functions and requirements.				
b. Steam Generator Water Level - High-High	3/loop	2/loop in any operating loop	2/loop in each operating loop	1, 2	14*
6. AUXILIARY FEEDWATER PUMPS START					
a. Manual Initiation (Control Room and Panel C-160)	2/pump	1/pump	2/pump	1, 2, 3	21
b. From Safety Injection	See 1 above for initiating functions and requirements.				
c. Steam Generator Water Level - Low-Low	3/steam generator	2/any steam generator	2/steam generator	1, 2, 3	14*
d. Loss of Normal and Preferred Power	2/bus	1/bus	1/bus	1, 2, 3	18

TABLE 3.3-3 (Continued)

TABLE NOTATION

*The provisions of Specification 3.0.4 are not applicable.

#When above the P-11 setpoint.

##When above the P-12 setpoint.

###The channel(s) associated with the protective functions derived from the out of service Reactor Coolant Loop shall be placed in the tripped mode.

ACTION STATEMENTS

ACTION 13 - With the number of OPERABLE Channels one less that the Total Number of Channels, be in HOT STANDBY within 6 hours and in COLD SHUTDOWN within the next 30 hours. One channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1, provided the other channel is OPERABLE.

ACTION 14 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may continue until performance of the next required CHANNEL FUNCTIONAL TEST, provided the inoperable channel is placed in the tripped condition within 6 hours.

ACTION 15 - With a channel associated with an operating loop inoperable, restore the inoperable channel to OPERABLE status within 2 hours or be in HOT SHUTDOWN within the following 12 hours; however, one channel associated with an operating loop may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.

ACTION 16 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may continue with the inoperable channel bypassed, provided that the Minimum Channels OPERABLE requirement is met. One additional channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1.

ACTION 17 - With less than the Minimum Channels OPERABLE, operation may continue provided the containment ventilation valves are maintained closed.

ACTION 18 - 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.

TABLE 3.3-3 (Continued)

ACTION STATEMENTS

ACTION 19 - With the number of OPERABLE Channels one less than the Minimum Channels OPERABLE requirement, be in at least HOT SHUTDOWN within 12 hours. One channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.2.1 provided the other channel is OPERABLE.

ACTION 20 - With the number of OPERABLE Channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or declare the associated valve inoperable and take the ACTION required by Specification 3.7.1.6.

ACTION 21 - With the number of OPERABLE Channels one less than the Total Number of Channels, declare the associated auxiliary feedwater pump inoperable and apply the requirements of Specification 3.7.1.2.

ENGINEERED SAFETY FEATURES INTERLOCKS

DESIGNATION	CONDITION AND SETPOINT	FUNCTION
P-11	With 2 of 3 pressurizer pressure channels > 1925 psig.	Prevents or defeats manual block of safety injection actuation on low pressurizer pressure.
P-12	With 2 of 4 T_{avg} channels < 553°F	Allows manual block of safety injection actuation on high steam line flow and low steam line pressure. Causes steam line isolation on high steam flow. Affects steam dump blocks.
P-4	With both reactor trip breakers open.	Allows manual block of safety injection actuation. Causes turbine trip. Closes feedwater valves on low T_{avg} and prevents their reopening if closed by safety injection or high steam generator water level.
P-14	With 2 of 3 steam generator level channels >75% of narrow range instrument span.	Causes turbine trip and trips both feedwater pumps. Closes feedwater isolation, bypass, and regulating valves.

TABLE 3.3-4

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS*

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
1. SAFETY INJECTION		
a. Containment Pressure - High	≤ 4 psig	≤ 4.5 psig
b. Pressurizer Pressure - Low	≥ 1765 psig	≥ 1755 psig
c. Differential Pressure Between Steam Lines - High	≤ 100 psi	≤ 112 psi
d. Steam Flow in Two Steam Lines - High Coincident with T_{avg} - Low-Low or Steam Line Pressure - Low	≤ A function defined as follows: 40% of full steam flow between 0% and 20% load and then increasing linearly to 110% of full steam flow at full load T_{avg} ≥ 553°F ≥ 600 psig steam line pressure	≤ A function defined as follows: 44% of full steam flow between 0% and 20% load and then increasing linearly to 111.5% of full steam flow at full load T_{avg} ≥ 551°F ≥ 580 psig steam line pressure
2. CONTAINMENT SPRAY		
a. Containment Pressure - High-High	≤ 30 psig	≤ 32 psig
3. CONTAINMENT ISOLATION		
a. Containment Isolation Signal		
1. From Safety Injection	See 1 above for applicable data.	

* The Actuation Logic and Manual Initiation Circuitry does not have trip setpoints or allowable values and is therefore not included in this table.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
b. Containment Ventilation Isolation		
1. From Safety Injection	See 1 above for applicable data.	
2. Containment Radioactivity - High	$\leq$ 2 x background	$\leq$ 2 x background
4. STEAM LINE ISOLATION		
a. Containment Pressure - High-High	$\leq$ 30 psig	$\leq$ 32 psig
b. Steam Flow in Two Steam Lines - High Coincident with T_{avg} - Low or Steam Line Pressure - Low	$\leq$ A function defined as follows: 40% of full steam flow between 0% and 20% load and then increasing linearly to 110% of full steam flow at full load $T_{avg} \geq$ 553°F $\geq$ 600 psig steam line pressure	$\leq$ A function defined as follows: 44% of full steam flow between 0% and 20% load and then increasing linearly to 111.5% of full steam flow at full load $T_{avg} \geq$ 551°F $\geq$ 580 psig steam line pressure
5. TURBINE TRIP AND FEEDWATER ISOLATION		
a. From Safety Injection	See 1 above for applicable data.	
b. Steam Generator Water Level - High-High	$\leq$ 75% of narrow range instrument span each steam generator	$\leq$ 76% of narrow range instrument span each steam generator

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
6. AUXILIARY FEEDWATER PUMPS START		
a. From Safety Injection	See 1 above for applicable data.	
b. Steam Generator Water Level - Low-Low	≥ 5% of narrow range instrument span each steam generator	≥ 3% of narrow range instrument span each steam generator
c. Loss of Normal and Preferred Power	≥ 2520 volts	≥ 2478 volts

TABLE 3.3-5

ENGINEERED SAFETY FEATURES RESPONSE TIMES[Ψ]

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
1. Manual	
Response Time testing is not applicable to manual initiation circuitry.	
2. Containment Pressure - High	
a. Safety Injection (ECCS)	≤ 27.0*
b. Reactor Trip (from SI)	≤ 3.0
c. Feedwater Isolation	≤ 8.0
d. Containment Isolation Signal	≤ 18.0#/28.00##
e. Service Water System	≤ 13.0#/48.0##
f. Emergency Fan Coolers	≤ 10.0#/49.0##
3. Pressurizer Pressure - Low	
a. Safety Injection (ECCS)	≤ 13.0#/27.0*
b. Reactor Trip (from SI)	≤ 3.0
c. Feedwater Isolation	≤ 8.0
d. Containment Isolation Signal	≤ 18.0#
e. Service Water System	≤ 13.0#/48.0*
f. Emergency Fan Coolers	≤ 10.0#/49.0##
4. Differential Pressure Between Steam Lines - High	
a. Safety Injection (ECCS)	≤ 13.0#/23.0##
b. Reactor Trip (from SI)	≤ 3.0
c. Feedwater Isolation	≤ 8.0

TABLE 3.3-5 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES[Ψ]

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
d. Containment Isolation Signal	≤ 18.0#/28.0##
e. Service Water System	≤ 13.0#/48.0##
f. Emergency Fan Coolers	≤ 10.0#/49.0##
5. Steam Flow in Two Steam Lines - High Coincident with Tavg - Low-Low	
a. Safety Injection (ECCS)	≤ 15.0#/25.0##
b. Reactor Trip (from SI)	≤ 5.0
c. Feedwater Isolation	≤ 10.0
d. Containment Isolation Signal	≤ 20.0#/30.0##
e. Service Water System	≤ 15.0#/50.0##
f. Steam Line Isolation	≤ 10.0
g. Emergency Fan Coolers	≤ 12.0#/51.0##
6. Steam Flow in Two Steam Lines - High Coincident with Steam Line Pressure - Low	
a. Safety Injection (ECCS)	≤ 13.0#/23.0##
b. Reactor Trip (from SI)	≤ 3.0
c. Feedwater Isolation	≤ 8.0
d. Containment Isolation Signal	≤ 18.0#/28.0##
e. Service Water System	≤ 14.0#/48.0##
f. Steam Line Isolation	≤ 8.0
g. Emergency Fan Coolers	≤ 10.0#/49.0##

TABLE 3.3-5 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES[Ψ]

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
7. Containment Pressure - High-High	
a. Containment Spray	≤ 30.0
b. Steam Line Isolation	≤ 7.0
8. Steam Generator Water Level - High-High	
a. Turbine Trip - Reactor Trip	≤ 2.5
b. Feedwater Isolation	≤ 11.0
9. Steam Generator Water Level - Low-Low	
a. Auxiliary Feedwater Pumps	≤ 60.0

Ψ Functions are not listed for which Response Time testing is Not Applicable.

* 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, SI and RHR pumps.

\# 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.

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				
a. Actuation Logic	N.A.	N.A.	Q	1, 2, 3, 4
b. Manual Initiation	N.A.	N.A.	R	1, 2, 3, 4
c. Containment Pressure - High	S	R	Q	1, 2, 3, 4
d. Pressurizer Pressure - Low	S	R	Q	1, 2, 3#
e. Differential Pressure Between Steam Lines - High	S	R	Q	1, 2, 3##
f. Steam Flow in Two Steam Lines - High Coincident with T_{avg} - Low-Low or Steam Line Pressure - Low	S	R	Q	1, 2, 3##
2. CONTAINMENT SPRAY				
a. Actuation Logic	N.A.	N.A.	Q	1, 2, 3, 4
b. Manual Initiation	N.A.	N.A.	R	1, 2, 3, 4
c. Containment Pressure - High-High	S	R	Q	1, 2, 3, 4

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
3. CONTAINMENT ISOLATION*				
a. Containment Isolation Signal				
1) Manual	N.A.	N.A.	R	1, 2, 3, 4
b. Containment Ventilation Isolation				
1) From Manual Containment Isolation	See 3.a above for requirements.			
2) From Manual Containment Spray	See 2.b above for requirements.			
3) Containment Radioactivity - High				1, 2, 3, 4
Particulate	S	R	Q	
Iodine	S	R	Q	
High Level Noble Gas	S	R	Q	
Low Level Noble Gas	S	R	Q	
4. STEAM LINE ISOLATION				
a. Actuation Logic	N.A.	N.A.	Q	1, 2, 3
b. Manual	N.A.	N.A.	R	1, 2, 3
c. Containment Pressure - High-High	S	R	Q	1, 2, 3
d. Steam Flow in Two Steam Lines - High Coincident with T_{avg} - Low or Steam Line Pressure - Low	See 1.f above for requirements.			

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
5. TURBINE TRIP AND FEEDWATER ISOLATION*				
a. Steam Generator Water Level - High-High	S	R	Q	1, 2
6. AUXILIARY FEEDWATER PUMPS START*				
a. Manual	N.A.	N.A.	R	1, 2, 3
b. Steam Generator Water Level - Low-Low	S	R	Q	1, 2, 3
c. Loss of Normal and Preferred Power	N.A.	R	N.A.	1, 2, 3

* For Safety Injection input, see Item 1 for surveillance requirements.

When above the P-11 setpoint.

When above the P-12 setpoint.

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