Attachment B

Proposed Technical Specification Pages
for Removal of the Main Steam Line
Radiation Monitor Scrams and Isolations

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PNPS Table 3.1.1 REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENTATION REQUIREMENT

Operable Inst. Channels per Trip System (1)		Trip Function	Trip Level Setting	Modes in Which Function Must Be Operable			Action (1)
Minimum	Avail.			Refuel (7)	Startup/Hot Standby	Run	
1	1	Mode Switch in Shutdown		X	X	X	A
1	1	Manual Scram		X	X	X	A
		IRM					
3	4	High Flux	≤120/125 of full scale	X	X	(5)	A
3	4	Inoperative		X	X	(5)	A
		APRM					
2	3	High Flux	(15)	(17)	(17)	X	A or B
2	3	Inoperative	(13)	X	X(9)	X	A or B
2	3	High Flux (15%)	≤15% of Design Power	X	X	(16)	A or B
2	2	High Reactor Pressure	≤1085 psig	X(10)	X	X	A
2	2	High Drywell Pressure	≤2.5 psig	X(8)	X(8)	X	A
2	2	Reactor Low Water Level	≥9 In. Indicated Level	X	X	X	A
		SDIV High Water Level:	≤39 Gallons	X(2)	X	X	A
2	2	East					
2	2	West					
2	2	Main Condenser Low Vacuum	≥23 In. Hg Vacuum	X(3)	X(3)	X	A or C
4	4	Main Steam Line Isolation Valve Closure	≤10% Valve Closure	X(3)(6)	X(3)(6)	X(6)	A or C
2	2	Turbine Control Valve Fast Closure	≥150 psig Control Oil Pressure at Acceleration Relay	X(4)	X(4)	X(4)	A or D
4	4	Turbine Stop Valve Closure	≤10% Valve Closure	X(4)	X(4)	X(4)	A or D

NOTES FOR TABLE 3.1.1 (Cont'd)

2. Permissible to bypass, with control rod block, for reactor protection system reset in refuel and shutdown positions of the reactor mode switch.
3. Permissible to bypass when reactor pressure is <600 psig.
4. Permissible to bypass when turbine first stage pressure is less than 305 psig.
5. IRM's are bypassed when APRM's are onscale and the reactor mode switch is in the run position.
6. The design permits closure of any two lines without a scram being initiated.
7. When the reactor is subcritical, fuel is in the reactor vessel and the reactor water temperature is less than 212 F, only the following trip functions need to be operable:

    A. Mode switch in shutdown
    B. Manual scram
    C. High flux IRM
    D. Scram discharge volume high level
    E. APRM (15%) high flux scram

8. Not required to be operable when primary containment integrity is not required.
9. Not required while performing low power physics tests at atmospheric pressure during or after refueling at power levels not to exceed 5 MW(t).
10. Not required to be operable when the reactor pressure vessel head is not bolted to the vessel.
11. Deleted
12. Deleted
13. An APRM will be considered inoperable if there are less than 2 LPRM inputs per level or there is less than 50% of the normal complement of LPRM's to an APRM.
14. Deleted
15. The APRM high flux trip level setting shall be as specified in the CORE OPERATING LIMITS REPORT, but shall in no case exceed 120% of rated thermal power.
16. The APRM (15%) high flux scram is bypassed when in the run mode.
17. The APRM flow biased high flux scram is bypassed when in the refuel or startup/hot standby modes.

TABLE 4.1.1

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENTATION FUNCTIONAL TESTS

MINIMUM FUNCTIONAL TEST FREQUENCIES FOR SAFETY INSTRUMENTATION AND CONTROL CIRCUITS

	Functional Test	Minimum Frequency (3)
Mode Switch in Shutdown	Place Mode Switch in Shutdown	Each Refueling Outage
Manual Scram	Trip Channel and Alarm	Every 3 Months
RPS Channel Test Switch (5)	Trip Channel and Alarm	Once per week
IRM		
High Flux	Trip Channel and Alarm (4)	Once Per Week During Refueling and Before Each Startup
Inoperative	Trip Channel and Alarm	Once Per Week During Refueling and Before Each Startup
APRM		
High Flux	Trip Output Relays (4)	Every 3 Months (7)
Inoperative	Trip Output Relays (4)	Every 3 Months
Flow Bias	Trip Output Relays (4)	Every 3 Months
High Flux (≤15%)	Trip Output Relays (4)	Once Per Week During Refueling and Before Each Startup
High Reactor Pressure	Trip Channel and Alarm (4)	Every 3 Months
High Drywell Pressure	Trip Channel and Alarm (4)	Every 3 Months
Reactor Low Water Level	Trip Channel and Alarm (4)	Every 3 Months
High Water Level in Scram Discharge Tanks	Trip Channel and Alarm (4)	Every 3 Months
Turbine Condenser Low Vacuum	Trip Channel and Alarm (4)	Every 3 Months
Main Steam Line Isolation Valve Closure	Trip Channel and Alarm	Every 3 Months
Turbine Control Valve Fast Closure	Trip Channel and Alarm	Every 3 Months
Turbine First Stage Pressure Permissive	Trip Channel and Alarm (4)	Every 3 Months
Turbine Stop Valve Closure	Trip Channel and Alarm	Every 3 Months
Reactor Pressure Permissive	Trip Channel and Alarm (4)	Every 3 Months

TABLE 4.1.2
REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENT CALIBRATION
MINIMUM CALIBRATION FREQUENCIES FOR REACTOR PROTECTION INSTRUMENT CHANNELS

Instrument Channel	Calibration Test (5)	Minimum Frequency (2)
IRM High Flux	Comparison to APRM on Controlled Shutdowns	Note (4)
	Full Calibration	Once/Operating Cycle
APRM High Flux		
Output Signal	Heat Balance	Once every 3 Days
Flow Bias Signal	Calibrate Flow Comparator and Flow Bias Network	Each Refueling Outage
	Calibrate Flow Bias Signal (1)	Every 3 Months
LPRM Signal	TIP System Traverse	Every 1000 Effective Full Power Hours
High Reactor Pressure	Note (7)	Note (7)
High Drywell Pressure	Note (7)	Note (7)
Reactor Low Water Level	Note (7)	Note (7)
High Water Level in Scram Discharge Tanks	Note (7)	Note (7)
Turbine Condenser Low Vacuum	Note (7)	Note (7)
Main Steam Line Isolation Valve Closure	Note (6)	Note (6)
Turbine First Stage Pressure Permissive	Note (7)	Note (7)
Turbine Control Valve Fast Closure	Standard Pressure Source	Every 3 Months
Turbine Stop Valve Closure	Note (6)	Note (6)
Reactor Pressure Permissive	Note (7)	Note (7)

NOTES FOR TABLE 4.1.2

1. Adjust the flow bias trip reference, as necessary, to conform to a calibrated flow signal.

2. Calibration tests are not required when the systems are not required to be operable or are tripped.

3. Deleted

4. Maximum frequency required is once per week.

5. Response time is not a part of the routine instrument channel test, but will be checked once per operating cycle.

6. Physical inspection and actuation of these position switches will be performed during the refueling outages.

7. Calibration of these devices will be performed during refueling outages.

   To verify transmitter output, a daily instrument check will be performed. Calibration of the associated analog trip units will be performed concurrent with functional testing as specified in Table 4.1.1.

3.1 BASES (Cont'd)

range of applicability of the fuel cladding integrity safety limit. In addition, the isolation valve closure scram anticipates the pressure and flux transients that occur during normal or inadvertent isolation valve closure. With the scrams set at 10 percent of valve closure, neutron flux does not increase.

High Reactor Pressure

The high reactor pressure scram setting is chosen slightly above the maximum normal operating pressure to permit normal operation without spurious scram, yet provide a wide margin to the ASME Section III allowable reactor coolant system pressure (1250 psig, see Bases Section 3.6.D).

High Drywell Pressure

Instrumentation for the drywell is provided to detect a loss of coolant accident and initiate the core standby cooling equipment. A high drywell pressure scram is provided at the same setting as the Core Standby Cooling Systems (CSCS) initiation to minimize the energy that must be accommodated during a loss of coolant accident and to prevent return to criticality. This instrumentation is a backup to the reactor vessel water level instrumentation.

Reactor Mode Switch

The reactor mode switch actuates or bypasses the various scram functions appropriate to the particular plant operating status (Reference FSAR Section 7.2.3.9).

Manual Scram

The manual scram function is active in all modes, thus providing for a manual means of rapidly inserting control rods during all modes of reactor operation.

PNPS TABLE 3.2.A

INSTRUMENTATION THAT INITIATES PRIMARY CONTAINMENT ISOLATION

Operable Instrument Channels Per Trip System (1)				
Minimum	Available	Instrument	Trip Level Setting	Action (2)
2(7)	2	Reactor Low Water Level	≥9" indicated level (3)	A and D
1	1	Reactor High Pressure	≤110 psig	D
2	2	Reactor Low-Low Water Level	at or above -49 in. indicated level (4)	A
2	2	Reactor High Water Level	≤48" indicated level (5)	B
2(7)	2	High Drywell Pressure	≤2.5 psig	A
2	2	Low Pressure Main Steam Line	≥880 psig (8)	B
2(6)	2	High Flow Main Steam Line	≤140% of rated steam flow	B
2	2	Main Steam Line Tunnel Exhaust Duct High Temperature	≤170°F	B
2	2	Turbine Basement Exhaust Duct High Temperature	≤150°F	B
1	1	Reactor Cleanup System High Flow	≤300% of rated flow	C
2	2	Reactor Cleanup System High Temperature	≤150°F	C

NOTES FOR TABLE 3.2.A

1. Whenever Primary Containment integrity is required by Section 3.7, there shall be two operable or tripped trip systems for each function. An instrument channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the tripped condition provided at least one OPERABLE channel in the same trip system is monitoring that parameter; or, where only one channel exists per trip system, the other trip system shall be operable.

2. Action

   If the minimum number of operable instrument channels cannot be met for one of the trip systems of a trip function, the appropriate conditions listed below shall be followed:

   If placing the inoperable channel(s) in the tripped condition would not cause an isolation, the inoperable channel(s) and/or that trip system shall be placed in the tripped condition within one hour (twelve hours for Reactor Low Water Level and High Drywell Pressure), or initiate the action required by Table 3.2.A for the affected trip functions.

   If placing the inoperable channel(s) in the tripped condition would cause an isolation, the inoperable channel(s) shall be restored to operable status within two hours (six hours for Reactor Low Water Level and High Drywell Pressure) or initiate the Action required by Table 3.2.A for the affected trip function.

   If the minimum number of operable instrument channels cannot be met for both trip systems, place at least one trip system (with the most inoperable channels) in the tripped condition within one hour or initiate the appropriate Action required by Table 3.2.A listed below for the affected trip function.

   A. Initiate an orderly shutdown and have the reactor in Cold Shutdown Condition in 24 hours.

   B. Initiate an orderly load reduction and have Main Steam Lines isolated within eight hours.

   C. Isolate Reactor Water Cleanup System.

   D. Isolate Shutdown Cooling.

3. Instrument set point corresponds to 128.26 inches above top of active fuel.

4. Instrument set point corresponds to 77.26 inches above top of active fuel.

5. Not required in Run Mode (bypassed by Mode Switch).

6. Two required for each steam line.

7. These signals also start SBGTS and initiate secondary containment isolation.

8. Only required in Run Mode (interlocked with Mode Switch).

9. Deleted.

NOTES FOR TABLES 4.2.A THROUGH 4.2.G

1. Initially once per month until exposure hours (M as defined on Figure 4.1.1) is 2.0×10^5; thereafter, according to Figure 4.1.1 with an interval not less than one month nor more than three months.

2. Functional tests, calibrations and instrument checks are not required when these instruments are not required to be operable or are tripped. Functional tests shall be performed before each startup with a required frequency not to exceed once per week. Calibrations of IRMs and SRMs shall be performed during each startup or during controlled shutdowns with a required frequency not to exceed once per week. Instrument checks shall be performed at least once per day during those periods when the instruments are required to be operable.

3. This instrumentation is excepted from the functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel.

4. Simulated automatic actuation shall be performed once each operating cycle. Where possible, all logic system functional tests will be performed using the test jacks.

5. Reactor low water level and high drywell pressure are not included on Table 4.2.A since they are tested on Tables 4.1.1 and 4.1.2.

6. The logic system functional tests shall include a calibration of time delay relays and timers necessary for proper functioning of the trip systems.

7. Calibration of analog trip units will be performed concurrent with functional testing. The functional test will consist of injecting a simulated electrical signal into the measurement channel. Calibration of associated analog transmitters will be performed each refueling outage.

Valves, Main Steam Drain Valves, Recirc Sample Valves (Group 1) activates the CSCS subsystems, starts the emergency diesel generators and trips the recirculation pumps. This trip setting level was chosen to be high enough to prevent spurious actuation but low enough to initiate CSCS operation and primary system isolation so that no fuel damage will occur and so that post accident cooling can be accomplished and the guidelines of 10 CFR 100 will not be violated. For large breaks up to the complete circumferential break of a 28-inch recirculation line and with the trip setting given above, CSCS initiation and primary system isolation are initiated in time to meet the above criteria.

The high drywell pressure instrumentation is a diverse signal to the water level instrumentation and in addition to initiating CSCS, it causes isolation of Group 2 isolation valves. For the breaks discussed above, this instrumentation will initiate CSCS operation at about the same time as the low low water level instrumentation; thus the results given above are applicable here also. The low low water level instrumentation initiates protection for the full spectrum of loss-of-coolant accidents and causes isolation of Group 1 isolation valves.

Venturis are provided in the main steam lines as a means of measuring steam flow and also limiting the loss of mass inventory from the vessel during a steam line break accident. The primary function of the instrumentation is to detect a break in the main steam line. For the worst case accident, main steam line break outside the drywell, a trip setting of 140% of rated steam flow in conjunction with the flow limiters and main steam line valve closure, limits the mass inventory loss such that fuel is not uncovered, fuel temperatures remain approximately 1000°F and release of radioactivity to the environs is well below 10 CFR 100 guidelines.

Temperature monitoring instrumentation is provided in the main steam line tunnel and the turbine basement to detect leaks in these areas. Trips are provided on this instrumentation and when exceeded, cause closure of isolation valves. The setting of 170°F for the main steam line tunnel detector is low enough to detect leaks of the order of 5 to 10 gpm; thus, it is capable of covering the entire spectrum of breaks. For large breaks, the high steam flow instrumentation is a backup to the temperature instrumentation.

Pressure instrumentation is provided to close the main steam isolation valves in Run Mode when the main steam line pressure drops below 880 psig. In the Refuel and Startup Mode this function is replaced by high reactor water level. This function is provided primarily to provide protection against a pressure regulator malfunction which results in the control and/or bypass valves opening. With the trip settings specified, inventory loss is limited so that fuel is not uncovered.

The HPCI high flow and temperature instrumentation are provided to detect a break in the HPCI steam piping. Tripping of this instrumentation results in actuation of HPCI isolation valves. Tripping logic for the high flow is a 1 out of 2 logic, and all sensors are required to be operable.

Temperature is monitored at three (3) locations with four (4) temperature sensors at each location. Two (2) sensors at each location are powered by "A" direct current control bus and two (2) by "B" direct current control bus. Each pair of sensors, e.g., "A" or "B", at each location are physically separated and the tripping of either "A" or "B" bus sensor will actuate HPCI isolation valves.

The trip settings of ≤ 300% of design flow for high flow and 200°F or 170°F, depending on sensor location, for high temperature are such that core uncovery is prevented and fission product release is within limits.

The RCIC high flow and temperature instrumentation are arranged the same as that for the HPCI. The trip setting of ≤ 300% for high flow and 200°F, 170°F and 150°F, depending on sensor location, for temperature are based on the same criteria as the HPCI.

The Reactor Water Cleanup System high flow and temperature instrumentation are arranged similar as that for the HPCI. The trip settings are such that core uncovery is prevented and fission product release is within limits.

The instrumentation which initiates CSCS action is arranged in a dual bus system. As for other vital instrumentation arranged in this fashion, the Specification preserves the effectiveness of the system even during periods when maintenance or testing is being performed. An exception to this is when logic functional testing is being performed.

3/4.8.G Main Condenser (Continued)

Two air ejector off-gas monitors are provided and when their trip point is reached, cause an isolation of the air ejector off-gas line. Isolation is initiated when both instruments reach their high trip point or one has an upscale trip and the other a downscale trip. There is a fifteen minute delay before the air ejector off-gas isolation valve is closed. This delay is accounted for by the 30-minute holdup time of the off-gas before it is released to the stack.

Both instruments are required for trip but the instruments are so designed that any instrument failure gives a downscale trip. The trip settings of the instruments are set so that the instantaneous stack release rate limit given in Specification 3.8 is not exceeded.

H. Mechanical Vacuum Pump

The purpose of isolating the mechanical vacuum pump line is to limit the release of activity from the main condenser. During a Control Rod Drop Accident, fission products would be transported from the reactor through the main steam lines to the condenser. The fission product radioactivity would be sensed by the main steam line radioactivity monitors, initiating isolation of the mechanical vacuum pump.

Attachment C

Marked-up Technical Specification Pages
for Removal of the Main Steam Line
Radiation Monitor Scrams and Isolations

Marked-up Pages:
27
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46a
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193f

Operable Inst. Channels per Trip System (1) Minimum	Avail.	Trip Function	Trip Level Setting	Modes in Which Function Must Be Operable Refuel (7)	Startup/Hot Standby	Run	Action (1)
1	1	Mode Switch in Shutdown		X	X	X	A
1	1	Manual Scram		X	X	X	A
		IRM					
3	4	High Flux	≤120/125 of full scale	X	X	(5)	A
3	4	Inoperative		X	X	(5)	A
		APRM					
2	3	High Flux	(15)	(17)	(17)	X	A or B
2	3	Inoperative	(13)	X	X(9)	X	A or B
2	3	High Flux (15%)	≤15% of Design Power	X	X	(16)	A or B
2	2	High Reactor Pressure	≤1085 psig	X(10)	X	X	A
2	2	High Drywell Pressure	≤2.5 psig	X(8)	X(8)	X	A
2	2	Reactor Low Water Level	≥9 In. Indicated Level	X	X	X	A
		SDIV High Water Level:	≤39 Gallons	X(2)	X	X	A
2	2	East					
2	2	West					
2	2	Main Condenser Low Vacuum	≥23 In. Hg Vacuum	X(3)	X(3)	X	A or C
2	2	Main Steam Line High Radiation	≤7X Normal Full Power Background (18)	X	X	X(18)	A or C
4	4	Main Steam Line Isolation Valve Closure	≤10% Valve Closure	X(3)(6)	X(3)(6)	X(6)	A or C
2	2	Turbine Control Valve Fast Closure	≥150 psig Control Oil Pressure at Acceleration Relay	X(4)	X(4)	X(4)	A or D
4	4	Turbine Stop Valve Closure	≤10% Valve Closure	X(4)	X(4)	X(4)	A or D

delete

NOTES FOR TABLE 3.1.1 (Cont'd)

2. Permissible to bypass, with control rod block, for reactor protection system reset in refuel and shutdown positions of the reactor mode switch.
3. Permissible to bypass when reactor pressure is <600 psig.
4. Permissible to bypass when turbine first stage pressure is less than 305 psig.
5. IRM's are bypassed when APRM's are onscale and the reactor mode switch is in the run position.
6. The design permits closure of any two lines without a scram being initiated.
7. When the reactor is subcritical, fuel is in the reactor vessel and the reactor water temperature is less than 212 F, only the following trip functions need to be operable:

    A. Mode switch in shutdown
    B. Manual scram
    C. High flux IRM
    D. Scram discharge volume high level
    E. APRM (15%) high flux scram

8. Not required to be operable when primary containment integrity is not required.
9. Not required while performing low power physics tests at atmospheric pressure during or after refueling at power levels not to exceed 5 MW(t).
10. Not required to be operable when the reactor pressure vessel head is not bolted to the vessel.
11. Deleted
12. Deleted
13. An APRM will be considered inoperable if there are less than 2 LPRM inputs per level or there is less than 50% of the normal complement of LPRM's to an APRM.
14. Deleted
15. The APRM high flux trip level setting shall be as specified in the CORE OPERATING LIMITS REPORT, but shall in no case exceed 120% of rated thermal power.
16. The APRM (15%) high flux scram is bypassed when in the run mode.
17. The APRM flow biased high flux scram is bypassed when in the refuel or startup/hot standby modes.
18. Within 24 hours prior to the planned start of hydrogen injection with the reactor power at greater than 20% rated power, the normal full power radiation background level and associated trip setpoints may be changed based on a calculated value of the radiation level expected during the injection of hydrogen. The background radiation level and associated trip setpoints may be adjusted based on either calculations or measurements of actual radiation levels resulting from hydrogen injection. The background radiation level shall be determined and associated trip setpoints shall be set within 24 hours of re-establishing normal radiation levels after completion of hydrogen injection and prior to withdrawing control rods at reactor power levels below 20% rated power.

delete

REACTOR PROTECTION SYSTEM (SC) INSTRUMENTATION FUNCTIONAL TESTS

MINIMUM FUNCTIONAL TEST FREQUENCIES FOR SAFETY INSTRUMENTATION AND CONTROL CIRCUITS

	Functional Test	Minimum Frequency (3)
Mode Switch in Shutdown	Place Mode Switch in Shutdown	Each Refueling Outage
Manual Scram	Trip Channel and Alarm	Every 3 Months
RPS Channel Test Switch (5)	Trip Channel and Alarm	Once per week
IRM		
High Flux	Trip Channel and Alarm (4)	Once Per Week During Refueling and Before Each Startup
Inoperative	Trip Channel and Alarm	Once Per Week During Refueling and Before Each Startup
APRM		
High Flux	Trip Output Relays (4)	Every 3 Months (7)
Inoperative	Trip Output Relays (4)	Every 3 Months
Flow Bias	Trip Output Relays (4)	Every 3 Months
High Flux (15%)	Trip Output Relays (4)	Once Per Week During Refueling and Before Each Startup
High Reactor Pressure	Trip Channel and Alarm (4)	Every 3 Months
High Drywell Pressure	Trip Channel and Alarm (4)	Every 3 Months
Reactor Low Water Level	Trip Channel and Alarm (4)	Every 3 Months
High Water Level in Scram Discharge Tanks	Trip Channel and Alarm (4)	Every 3 Months
Turbine Condenser Low Vacuum	Trip Channel and Alarm (4)	Every 3 Months
Main Steam Line High Radiation	Trip Channel and Alarm (4)	Every 3 Months delete
Main Steam Line Isolation Valve Closure	Trip Channel and Alarm	Every 3 Months
Turbine Control Valve Fast Closure	Trip Channel and Alarm	Every 3 Months
Turbine First Stage Pressure Permissive	Trip Channel and Alarm (4)	Every 3 Months
Turbine Stop Valve Closure	Trip Channel and Alarm	Every 3 Months
Reactor Pressure Permissive	Trip Channel and Alarm (4)	Every 3 Months

TABLE 4.1.2
REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENT CALIBRATION
MINIMUM CALIBRATION FREQUENCIES FOR REACTOR PROTECTION INSTRUMENT CHANNELS

Instrument Channel	Calibration Test (5)	Minimum Frequency (2)
IRM High Flux	Comparison to APRM on Controlled Shutdowns	Note (4)
	Full Calibration	Once/Operating Cycle
APRM High Flux		
Output Signal	Heat Balance	Once every 3 Days
Flow Bias Signal	Calibrate Flow Comparator and Flow Bias Network	Each Refueling Outage
	Calibrate Flow Bias Signal (1)	Every 3 Months
LPRM Signal	TIP System Traverse	Every 1000 Effective Full Power Hours
High Reactor Pressure	Note (7)	Note (7)
High Drywell Pressure	Note (7)	Note (7)
Reactor Low Water Level	Note (7)	Note (7)
High Water Level in Scram Discharge Tanks	Note (7)	Note (7)
Turbine Condenser Low Vacuum	Note (7)	Note (7)
Main Steam Line Isolation Valve Closure	Note (6)	Note (6)
Main Steam Line High Radiation	Standard Current Source (3)	Every 3 Months
Turbine First Stage Pressure Permissive	Note (7)	Note (7)
Turbine Control Valve Fast Closure	Standard Pressure Source	Every 3 Months
Turbine Stop Valve Closure	Note (6)	Note (6)
Reactor Pressure Permissive	Note (7)	Note (7)

delete

NOTES FOR TABLE 4.1.2

1. Adjust the flow bias trip reference, as necessary, to conform to a calibrated flow signal.

2. Calibration tests are not required when the systems are not required to be operable or are tripped.

3. The current source provides an instrument channel alignment. Calibration using a radiation source shall be made each refueling outage. Deleted

4. Maximum frequency required is once per week.

5. Response time is not a part of the routine instrument channel test, but will be checked once per operating cycle.

6. Physical inspection and actuation of these position switches will be performed during the refueling outages.

7. Calibration of these devices will be performed during refueling outages.

   To verify transmitter output, a daily instrument check will be performed. Calibration of the associated analog trip units will be performed concurrent with functional testing as specified in Table 4.1.1.

range of applicability of the fuel cladding integrity safety limit. In addition, the isolation valve closure scram anticipates the pressure and flux transients that occur during normal or inadvertent isolation valve closure. With the scrams set at 10 percent of valve closure, neutron flux does not increase.

High Reactor Pressure

The high reactor pressure scram setting is chosen slightly above the maximum normal operating pressure to permit normal operation without spurious scram, yet provide a wide margin to the ASME Section III allowable reactor coolant system pressure (1250 psig, see Bases Section 3.6.D).

High Drywell Pressure

Instrumentation for the drywell is provided to detect a loss of coolant accident and initiate the core standby cooling equipment. A high drywell pressure scram is provided at the same setting as the Core Standby Cooling Systems (CSCS) initiation to minimize the energy that must be accommodated during a loss of coolant accident and to prevent return to criticality. This instrumentation is a backup to the reactor vessel water level instrumentation.

delete

Main Steam Line High Radiation

High radiation levels in the main steam line tunnel above that due to the normal nitrogen and oxygen radioactivity is an indication of leaking fuel. A scram is initiated whenever such radiation level exceeds seven times normal background. The purpose of this scram is to reduce the source of such radiation to the extent necessary to prevent excessive turbine contamination. Discharge of excessive amounts of radioactivity to the site environs is prevented by the air ejector off-gas monitors that cause an isolation of the main condenser off-gas line.

Reactor Mode Switch

The reactor mode switch actuates or bypasses the various scram functions appropriate to the particular plant operating status (Reference FSAR Section 7.2.3.9).

Manual Scram

The manual scram function is active in all modes, thus providing for a manual means of rapidly inserting control rods during all modes of reactor operation.

PNPS TABLE 3.2.A

INSTRUMENTATION THAT INITIATES PRIMARY CONTAINMENT ISOLATION

Operable Instrument Channels Per Trip System (1) Minimum	Available	Instrument	Trip Level Setting	Action (2)
2(7)	2	Reactor Low Water Level	≥9" indicated level (3)	A and D
1	1	Reactor High Pressure	≤110 psig	D
2	2	Reactor Low-Low Water Level	at or above -49 in. indicated level (4)	A
2	2	Reactor High Water Level	≤48" indicated level (5)	B
2(7)	2	High Drywell Pressure	≤2.5 psig	A
2	2	High Radiation Main Steam Line Tunnel (9)	≤7 times normal rated full power background	B
2	2	Low Pressure Main Steam Line	≥880 psig (8)	B
2(6)	2	High Flow Main Steam Line	≤140% of rated steam flow	B
2	2	Main Steam Line Tunnel Exhaust Duct High Temperature	≤170°F	B
2	2	Turbine Basement Exhaust Duct High Temperature	≤150°F	B
1	1	Reactor Cleanup System High Flow	≤300% of rated flow	C
2	2	Reactor Cleanup System High Temperature	≤150°F	C

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NOTES FOR TABLE 3.2.A

1. Whenever Primary Containment integrity is required by Section 3.7, there shall be two operable or tripped trip systems for each function. An instrument channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the tripped condition provided at least one OPERABLE channel in the same trip system is monitoring that parameter; or, where only one channel exists per trip system, the other trip system shall be operable.

2. Action

If the minimum number of operable instrument channels cannot be met for one of the trip systems of a trip function, the appropriate conditions listed below shall be followed:

If placing the inoperable channel(s) in the tripped condition would not cause an isolation, the inoperable channel(s) and/or that trip system shall be placed in the tripped condition within one hour (twelve hours for Reactor Low Water Level, High Drywell Pressure, ~~and Main Steam Line High Radiation~~) or initiate the action required by Table 3.2.A for the affected trip functions.

If placing the inoperable channel(s) in the tripped condition would cause an isolation, the inoperable channel(s) shall be restored to operable status within two hours (six hours for Reactor Low Water Level, High Drywell Pressure, and Main Steam Line High Radiation) or initiate the Action required by Table 3.2.A for the affected trip function.

If the minimum number of operable instrument channels cannot be met for both trip systems, place at least one trip system (with the most inoperable channels) in the tripped condition within one hour or initiate the appropriate Action required by Table 3.2.A listed below for the affected trip function.

A. Initiate an orderly shutdown and have the reactor in Cold Shutdown Condition in 24 hours.

B. Initiate an orderly load reduction and have Main Steam Lines isolated within eight hours.

C. Isolate Reactor Water Cleanup System.

D. Isolate Shutdown Cooling.

3. Instrument set point corr·sponds to 128.26 inches above top of active fuel.

4. Instrument set point corresponds to 77.26 inches above top of active fuel.

5. Not required in Run Mode (bypassed by Mode Switch).

6. Two required for each steam line.

7. These signals also start SBGTS and initiate secondary containment isolation.

8. Only required in Run Mode (interlocked with Mode Switch).

9. Within 24 hours prior to the planned start of hydrogen injection with the reactor power at greater than 20% rated power, the normal full power radiation background level and associated trip setpoints may be changed based on a calculated value of the radiation level expected during the injection of hydrogen. The background radiation level and associated trip setpoints may be adjusted based on either calculations or measurements of actual radiation levels resulting from hydrogen injection. The background radiation level shall be determined and associated trip setpoints shall be set within 24 hours of re-establishing normal radiation levels after completion of hydrogen injection and prior to withdrawing control rods at reactor power levels below 20% rated power.

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NOTES FOR TABLES 4.2.A THROUGH 4.2.G

1. Initially once per month until exposure hours (M as defined on Figure 4.1.1) is 2.0 x 10^5; thereafter, according to Figure 4.1.1 with an interval not less than one month nor more than three months.

2. Functional tests, calibrations and instrument checks are not required when these instruments are not required to be operable or are tripped. Functional tests shall be performed before each startup with a required frequency not to exceed once per week. Calibrations of IRMs and SRMs shall be performed during each startup or during controlled shutdowns with a required frequency not to exceed once per week. Instrument checks shall be performed at least once per day during those periods when the instruments are required to be operable.

3. This instrumentation is excepted from the functional test definition. The functional test will consist of injecting a simulated electrical signal into the measurement channel.

4. Simulated automatic actuation shall be performed once each operating cycle. Where possible, all logic system functional tests will be performed using the test jacks.

5. Reactor low water level, and high drywell pressure and main steam line high radiation are not included on Table 4.2.A since they are tested on Tables 4.1.1 and 4.1.2.

6. The logic system functional tests shall include a calibration of time delay relays and timers necessary for proper functioning of the trip systems.

7. Calibration of analog trip units will be performed concurrent with functional testing. The functional test will consist of injecting a simulated electrical signal into the measurement channel. Calibration of associated analog transmitters will be performed each refueling outage.

Valves, Main Steam Drain Valves, Recirc Sample Valves (Group 1) activates the CSCS subsystems, starts the emergency diesel generators and trips the recirculation pumps. This trip setting level was chosen to be high enough to prevent spurious actuation but low enough to initiate CSCS operation and primary system isolation so that no fuel damage will occur and so that post accident cooling can be accomplished and the guidelines of 10 CFR 100 will not be violated. For large breaks up to the complete circumferential break of a 28-inch recirculation line and with the trip setting given above, CSCS initiation and primary system isolation are initiated in time to meet the above criteria.

The high drywell pressure instrumentation is a diverse signal to the water level instrumentation and in addition to initiating CSCS, it causes isolation of Group 2 isolation valves. For the breaks discussed above, this instrumentation will initiate CSCS operation at about the same time as the low low water level instrumentation; thus the results given above are applicable here also. The low low water level instrumentation initiates protection for the full spectrum of loss-of-coolant accidents and causes isolation of Group 1 isolation valves.

Venturis are provided in the main steam lines as a means of measuring steam flow and also limiting the loss of mass inventory from the vessel during a steam line break accident. The primary function of the instrumentation is to detect a break in the main steam line. For the worst case accident, main steam line break outside the drywell, a trip setting of 140% of rated steam flow in conjunction with the flow limiters and main steam line valve closure, limits the mass inventory loss such that fuel is not uncovered, fuel temperatures remain approximately 1000°F and release of radioactivity to the environs is well below 10 CFR 100 guidelines.

Temperature monitoring instrumentation is provided in the main steam line tunnel and the turbine basement to detect leaks in these areas. Trips are provided on this instrumentation and when exceeded, cause closure of isolation valves. The setting of 170°F for the main steam line tunnel detector is low enough to detect leaks of the order of 5 to 10 gpm; thus, it is capable of covering the entire spectrum of breaks. For large breaks, the high steam flow instrumentation is a backup to the temperature instrumentation.

High radiation monitors in the main steam line tunnel have been provided to detect gross fuel failure as in the control rod drop acci-

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dent. With the established setting of 7 times normal background, and main steam line isolation valve closure, fission product release is limited so that 10 CFR 100 guidelines are not exceeded for this accident. Reference FSAR Section 14.5.1 and Appendix R.3.2.5.

Pressure instrumentation is provided to close the main steam isolation valves in Run Mode when the main steam line pressure drops below 880 psig. In the Refuel and Startup Mode this function is replaced by high reactor water level This function is provided primarily to provide protection against a pressure regulator malfunction which results in the control and/or bypass valves opening. With the trip settings specified, inventory loss is limited so that fuel is not uncovered.

The HPCI high flow and temperature instrumentation are provided to detect a break in the HPCI steam piping. Tripping of this instrumentation results in actuation of HPCI isolation valves. Tripping logic for the high flow is a 1 out of 2 logic, and all sensors are required to be operable.

Temperature is monitored at three (3) locations with four (4) temperature sensors at each location. Two (2) sensors at each location are powered by "A" direct current control bus and two (2) by "B" direct current control bus. Each pair of sensors, e.g., "A" or "B", at each location are physically separated and the tripping of either "A" or "B" bus sensor will actuate HPCI isolation valves.

The trip settings of ≤ 300% of design flow for high flow and 200°F or 170°F, depending on sensor location, for high temperature are such that core uncovery is prevented and fission product release is within limits.

The RCIC high flow and temperature instrumentation are arranged the same as that for the HPCI. The trip setting of ≤ 300% for high flow and 200°F, 170°F and 150°F, depending on sensor location, for temperature are based on the same criteria as the HPCI.

The Reactor Water Cleanup System high flow and temperature instrumentation are arranged similar as that for the HPCI. The trip settings are such that core uncovery is prevented and fission product release is within limits.

The instrumentation which initiates CSCS action is arranged in a dual bus system. As for other vital instrumentation arranged in this fashion, the Specification preserves the effectiveness of the system even during periods when maintenance or testing is being performed. An exception to this is when logic functional testing is being performed.

3/4.8.G Main Condenser (Continued)

Two air ejector off-gas monitors are provided and when their trip point is reached, cause an isolation of the air ejector off-gas line. Isolation is initiated when both instruments reach their high trip point or one has an upscale trip and the other a downscale trip. There is a fifteen minute delay before the air ejector off-gas isolation valve is closed. This delay is accounted for by the 30-minute holdup time of the off-gas before it is released to the stack.

Both instruments are required for trip but the instruments are so designed that any instrument failure gives a downscale trip. The trip settings of the instruments are set so that the instantaneous stack release rate limit given in Specification 3.8 is not exceeded.

H. Mechanical Vacuum Pump

A Control Rod Drop

The purpose of isolating the mechanical vacuum pump line is to limit the release of activity from the main condenser. During an accident, fission products would be transported from the reactor through the main steam lines to the condenser. The fission product radioactivity would be sensed by the main steam line radioactivity monitors, which initiate isolation.

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of the mechanical vacuum pump.