Proposed TS Pages

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Table 3.1-1 (Cont'd)

Scram Number (a)	Source of Scram Trip Signal	Operable Channels Required Per Trip System (b)	Scram Trip Setting	Source of Scram Signal is Required to be Operable Except as Indicated Below
12	Turbine Stop Valve Closure	4	$\leq$10% valve closure from full open Tech Spec 2.1.A.3.	Automatically bypassed when turbine steam flow is below that corresponding to 30% of rated thermal power as measured by turbine first stage pressure.

Notes for Table 3.1-1

a. The column entitled "Scram Number" is for convenience so that a one-to-one relationship can be established between items in Table 3.1-1 and items in Table 4.1-1.

b.1. There shall be two operable or tripped trip systems for each potential scram signal. If the number of operable channels cannot be met for one of the trip systems, that trip system shall be tripped.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions, provided at least one operable channel in the same trip system is monitoring that parameter.

c. Within 24 hours prior to the planned start of the hydrogen injection test 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 test. The background radiation level and associated trip setpoints may be adjusted during the test 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 establishing reactor power levels below 20% rated power.

4.1 REACTOR PROTECTION SYSTEM (RPS)

A. Testing Requirements for the RPS

The minimum functional test frequency and allowable outage time specified for RPS instrumentation are based on the NRC-approved reliability analyses performed in Reference 1. The analyses considered the Hatch-specific design, including the ATTS equipment discussed in References 2 and 3. Included in the Reference 1 analyses is justification for one instrument channel to be inoperable for up to 6 hours to perform required surveillances, provided at least one operable channel in the same trip system is monitoring that parameter, prior to entering other applicable actions.

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4.1.C. References

1. NEDC-30851P-A, "Technical Specification Improvement Analyses for BWR Protection System," March 1988.

2. NEDO-21617-A, "Analog Transmitter/Trip Unit System for Engineered Safeguard Sensor Trip Inputs."

3. NEDE-22154-1, "Analog Trip System for Engineered Safeguard Sensor Trip Inputs - Edwin I. Hatch Nuclear Plant Units 1 and 2."

Figure 4.1-1 Deleted

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.2 PROTECTIVE INSTRUMENTATION	4.2 PROTECTIVE INSTRUMENTATION
Applicability	Applicability
The Limiting Conditions for Operation apply to the plant instrumentation which performs a protective function.	The Surveillance Requirements apply to the instrumentation which performs a protective function.
Objective	Objective
The objective of the Limiting Conditions for Operation is to assure the operability of protective instrumentation.	The objective of the Surveillance Requirements is to specify the type and frequency of surveillance to be applied to protective instrumentation.
Specifications	Specifications
The Limiting Conditions for Operation of the protective instrumentation affecting each of the following protective actions shall be as indicated in the corresponding LCO table.	The check, functional test, and calibration minimum frequency for protective instrumentation affecting each of the following protective actions shall be as indicated in the corresponding SR table.

Protective Action	LCO Table	SR Table
A. Initiates Isolation Actuation	3.2-1	4.2-1
B. Initiates or Controls HPCI	3.2-2	4.2-2
C. Initiates or Controls RCIC	3.2-3	4.2-3
D. Initiates or Controls ADS	3.2-4	4.2-4
E. Initiates or Controls the LPCI Mode of RHR	3.2-5	4.2-5
F. Initiates or Controls Core Spray	3.2-6	4.2-6
G. Initiates Control Rod Blocks	3.2-7	4.2-7
H. Limits Radioactivity Release	3.2-8	4.2-8
I. Initiates Recirculation Pump Trip	3.2-9	4.2-9
J. Monitors Leakage Into the Drywell	3.2-10	4.2-10
K. Provides Surveillance Information	3.2-11	4.2-11
L. Initiates Disconnection of Offsite Power Sources	3.2-12	4.2-12
M. Initiates Energization by Onsite Power Sources	3.2-13	4.2-13
N. Arms the Low Low Set S/RV System	3.2-14	4.2-14

Table 3.2-1

ISOLATION ACTUATION INSTRUMENTATION

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Action to be taken if number of channels is not met for both trip systems (c)	Remarks (d)
1	Reactor Vessel Water Level	Low (Level 3) Narrow Range	2	≥ 0.0 inches	Initiate an orderly shutdown and achieve the Cold Shutdown Condition within 24 hours or isolate the shutdown cooling system.	Initiates Group 2 & 6 isolation.
		Low Low (Level 2)	2	≥-47 inches	Initiate an orderly shutdown and achieve the Cold Shutdown Condition within 24 hours.	Starts the SGTS, initiates Group 5 isolation, and initiates secondary containment isolation.
		Low Low Low (Level 1)	2	≥-113 inches	Initiate an orderly shutdown and achieve the Cold Shutdown Condition within 24 hours.	Initiates Group 1 isolation.
2	Reactor Vessel Steam Dome Pressure (Shutdown Cooling Mode)	Low Permissive	1	≤145 psig	Close the shutdown cooling supply isolation valves unless steam dome pressure ≤ 145 psig.	Isolates the shutdown cooling suction valves of the RHR system. Also, with primary containment isolation signal, closes RHR (LPCI) inboard motor operated injection valves.
3	Drywell Pressure	High	2	≤1.92 psig	Initiate an orderly shutdown and achieve the Cold Shutdown Condition within 24 hours.	Starts the standby gas treatment system, initiates Group 2 isolation and secondary containment isolation.

Table 3.2.1 (Cont.)

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Action to be taken if number of channels is not met for both trip systems (c)	Remarks (d)
13	HPCI Emergency Area Cooler Ambient Temperature	High	1	≤169°F	Close HPCI isolation valves and declare HPCI inoperable.	Closes isolation valves in HPCI system, trips HPCI turbine.
14	HPCI Steam Supply Pressure	Low	2	≥100 psig	Close HPCI isolation valves and declare HPCI inoperable.	Closes isolation valves in HPCI system, trips HPCI turbine.
15	HPCI Steam Line ΔP (Flow)	High	1	≤303% rated flow	Close HPCI isolation valves and declare HPCI inoperable.	Closes isolation valves in HPCI system, trips HPCI turbine.
16	HPCI Turbine Exhaust Diaphragm Pressure	High	2	≤20 psig	Close HPCI isolation valves and declare HPCI inoperable.	Closes isolation valves in HPCI system, trips HPCI turbine.
17	HPCI Suppression Chamber Area Ambient Temperature	High	1	≤169°F	Close HPCI isolation valves and declare HPCI inoperable.	Closes isolation valves in HPCI system, trips HPCI turbine.
18	HPCI Suppression Chamber Area Differential Air Temperature	High	1	≤42°F	Close HPCI isolation valves and declare HPCI inoperable.	Closes isolation valves in HPCI system, trips HPCI turbine.
19	RCIC Emergency Area Cooler Ambient Temperature	High	1	≤169°F	Close RCIC isolation valves and declare RCIC inoperable.	Closes isolation valves in RCIC system, trips RCIC turbine.
20	RCIC Steam Supply Pressure	Low	2	≥60 psig	Close RCIC isolation valves and declare RCIC inoperable.	Closes isolation valves in RCIC system, trips RCIC turbine.

Table 3.2-1 (Cont.)

Ref. f.o. (a)	Instrument	Trip Condition No. enclature	Required Operable Channels per Trip System (b)	Trip Setting	Action to be taken if number of channels is not met for both trip systems (c)	Remarks (d)
21	RCIC Steam Line ΔP (Flow)	High	1	≤306% rated flow	Close RCIC isolation valves and declare RCIC inoperable.	Closes isolation valves in RCIC system, trips RCIC turbine.
22	RCIC Turbine Exhaust Diaphragm Pressure	High	2	≤20 psig	Close RCIC isolation valves and declare RCIC inoperable.	Closes isolation valves in RCIC system, trips RCIC turbine.
23	RCIC Suppression Chamber Area Ambient Temperature	High	1	≤169°F	Close RCIC isolation valves and declare RCIC inoperable.	Closes isolation valves in RCIC system, trips RCIC turbine.
24	RCIC Suppression Chamber Area Differential Air Temperature	High	1	≤42°F	Close RCIC isolation valves and declare RCIC inoperable.	Closes isolation valves in RCIC system, trips RCIC turbine.

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between lines in Table 3.2-1 and items in Table 4.2-1.

b.1. Primary containment integrity shall be maintained at all times prior to withdrawing control rods for the purpose of going critical, when the reactor is critical, or when the reactor water temperature is above 212°F and fuel is in the reactor vessel except while performing low power physics tests at atmospheric pressure at power levels not to exceed 5 MWt, or performing an inservice vessel hydrostatic or leakage test.

When primary containment integrity is required, there shall be two operable or tripped trip systems for each function.

When performing inservice hydrostatic or leakage testing on the reactor vessel with the reactor coolant temperature above 212°F, reactor vessel water level instrumentation associated with the low low (Level 2) trip requires two operable or tripped channels. The drywell pressure trip is not required because primary containment integrity is not required.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

c.1. With the number of operable channels less than required by the Minimum Operable Channels per Trip System requirement for one trip system, either

1. place the inoperable channel(s) in the tripped condition* within 12 hours

OR

2. take the action required by Table 3.2-1.

*With a design providing only one channel per trip system, an inoperable channel need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, the inoperable channel shall be restored to operable status within 2 hours or the action required by Table 3.2-1 for that Trip Function shall be taken.

c.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

d. The valves associated with each Group isolation are given in Table 3.7-1.

e. Within 24 hours prior to the planned start of the hydrogen injection test 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 test. The background radiation level and associated trip setpoints may be adjusted during the test 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 establishing reactor power levels below 20% rated power.

Table 3.2-2

INSTRUMENTATION WHICH INITIATES OR CONTROLS HPCI

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks
1.	Reactor Vessel Water Level	Low Low (Level 2)	2	≥ -47 inches	Initiates HPCI; Also initiates RCIC.
2.	Drywell Pressure	High	2	≤ 1.92 psig	Initiates HPCI; Also initiates LPCI and Core Spray and provides a permissive signal to ADS.
3.	HPCI Turbine Overspeed	Mechanical	1	≤ 5000 rpm	Trips HPCI turbine
4.	HPCI Turbine Exhaust Pressure	High	1	≤ 146 psig	Trips HPCI turbine
5.	HPCI Pump Suction Pressure	Low	1	≤ 12.6 inches Hg vacuum	Trips HPCI turbine
6.	Reactor Vessel Water level	High (Level 8)	2	≤ +56.5 inches	Trips HPCI turbine
7.	HPCI Pump Discharge Flow	High	1	≥ 870 gpm (≥ 9.04 inches)	Closes HPCI minimum flow bypass line to suppression chamber.
		Low	1	≤ 605 gpm (≤ 4.36 inches)	Opens HPCI minimum flow bypass line if pressure permissive is present.
8.	Deleted				

Table 3.2-2 (Cont.)

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks
9.	Deleted				
10.	Deleted				
11.	Deleted				
12.	Deleted				
13.	Deleted				
14.	Condensate Storage Tank Level	Low	2	≥0 inches	Automatic interlock switches suction from CST to suppression chamber.
15.	Suppression Chamber Water Level	High	2	≤154.2 inches with respect to torus invert	Automatic interlock switches suction from CST to suppression chamber.
16.	HPCI Logic Power Failure Monitor		1	Not Applicable	Monitors availability of power to logic system.

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-2 and items in Table 4.2-2.

Notes for Table 3.2-2 (Cont.)

b.1. When any CCCS subsystem is required to be operable by Section 3.5, there shall be two operable trip systems. If the required number of operable channels cannot be met for one of the trip systems, place the inoperable channel in the tripped condition or declare the associated CCCS inoperable within 12 hours. If the required number of operable channels cannot be met for both trip systems, declare the associated CCCS inoperable within 1 hour.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

Table 3.2-3

INSTRUMENTATION WHICH INITIATES OR CONTROLS RCIC

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks
1.	Reactor Vessel Water Level	Low Low (Level 2)	2	≥ -47 inches	Initiates RCIC; also initiates HPCI.
2.	RCIC Turbine Overspeed	Electrical	1	≤ 110% rated	Trips RCIC turbine.
		Mechanical	1	≤ 125% rated	Trips RCIC turbine.
3.	RCIC Turbine Exhaust Pressure	High	1	≤ + 45 psig	Trips RCIC turbine.
4.	RCIC Pump Suction Pressure	Low	1	≤ 12.6 inches Hg Vacuum	Trips RCIC turbine.
5.	Reactor Vessel Water Level	High (Level 8)	2	≤ + 56.5 inches	Trips RCIC; automatically resets when water drops below level 8, system automatically restarts at level 2.
6.	RCIC Pump Discharge Flow	High	1	> 87 gpm (≥ 10.6 inches)	Closes RCIC minimum flow bypass line to suppression chamber.
		Low	1	≤ 53 gpm (≤ 3.87 inches)	Opens RCIC minimum flow bypass line if pressure permissive is present.
7.	Deleted				

Table 3.2-3 (Continued)

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks
8.	Deleted				
9.	Deleted				
10.	Deleted				
11.	Deleted				
12.	Deleted				
13.	RCIC Logic Power Failure Monitor		1	Not Applicable	Monitors availability of power to logic system.
14.	Condensate Storage Tank Water Level	Low	2	≥0"	Transfers suction from CST to suppression pool.
15.	Suppression Pool Water Level	High	2	≤0"	Transfers suction from CST to suppression pool.

NOTES FOR TABLE 3.2-3

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-3 and items in Table 4.2-3.

b.1. When any CCCS subsystem is required to be operable by Section 3.5, there shall be two operable trip systems. If the required number of operable channels cannot be met for one of the trip systems, place the inoperable channel in the tripped condition or declare the associated CCCS inoperable within 12 hours. If the required number of operable channels cannot be met for both trip systems, declare the associated CCCS inoperable within 1 hour.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

Table 3.2-4

INSTRUMENTATION WHICH INITIATES OR CONTROLS ADS

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks
1.	Reactor Vessel Water Level	Low (Level 3)	1	≥0.0 inches	Confirms Rx level, ADS permissive
	Reactor Vessel Water Level	Low Low Low (Level 1)	2	≥ -113 inches	Permissive signal to ADS timer
2.	Drywell Pressure	High	2	≤1.92 psig	Permissive signal to ADS timer
3.	RHR Pump Discharge Pressure	High	2	≥112 psig	Permissive signal to ADS timer
4.	CS Pump Discharge Pressure	High	2	≥137 psig	Permissive signal to ADS timer
5.	Auto Depressurization Low Water Level Timer		2	≤13 minutes	Bypasses high drywell pressure permissive upon sustained Level 1
6.	Auto Depressurization Timer		1	120 ± 12 seconds	With Level 3 and Level 1 and high drywell pressure and CS or RHR pump at pressure, timing sequence begins. If the ADS timer is not reset it will initiate ADS.
7.	Automatic Blowdown Control Power Failure Monitor		1	Not applicable	Monitors availability of power to logic system

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-4 and items in Table 4.2-4.

b.1. When any CCCS subsystem is required to be operable by Section 3.5, there shall be two operable trip systems. If the required number of operable channels cannot be met for one of the trip systems, place the inoperable channel in the tripped condition or declare the associated CCCS inoperable within 12 hours. If the required number of operable channels cannot be met for both trip systems, declare the associated CCCS inoperable within 1 hour.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

Table 3.2-5

INSTRUMENTATION WHICH INITIATES OR CONTROLS THE LPCI MODE OF RHR

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks
1.	Reactor Vessel Water Level	Low Low Low (Level 1)	2	≥-113 inches	Initiates LPCI mode of RHR
2.	Drywell Pressure	High	2	≤1.92 psig	Initiates LPCI mode of RHR. Also initiates HPCI and Core Spray and provides a permissive signal to ADS.
3.	Deleted				
3.a.	Reactor Vessel Steam Dome Pressure	Low	2	≥335	Permissive to close Recirculation Discharge Valve and Bypass Valve
3.b.	Reactor Vessel Steam Dome Pressure	Low	2	≥422 psig*	Permissive to open LPCI injection valves
4.	Reactor Shroud Water Level	Low (Level 0)	1	≥-202 inches	Acts as permissive to divert some LPCI flow to containment spray
5.	LPCI Cross Connect Valve Open Annunciator	N/A	1	Valve not closed	Initiates annunciator when valve is not closed

*This trip function shall be ≤500 psig.

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-5 and item in Table 4.2-5.

b.1. When any CCCS subsystem is required to be operable by Section 3.5, there shall be two operable trip systems. If the required number of operable channels cannot be met for one of the trip systems, place the inoperable channel in the tripped condition or declare the associated CCCS inoperable within 12 hours. If the required number of operable channels cannot be met for both trip systems, declare the associated CCCS inoperable within 1 hour.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

Table 3.2-6

INSTRUMENTATION WHICH INITIATES OR CONTROLS CORE SPRAY

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks
1.	Reactor Vessel Water Level	Low Low Low (Level 1)	2	≥-113 inches	Initiates CS.
2.	Drywell Pressure	High	2	≤1.92 psig	Initiates CS. Also initiates HPCI and LPCI mode of RHR and provides a permissive signal to ADS.
3.	Reactor Vessel Steam Dome Pressure	Low	2	≥422 psig*	Permissive to open CS injection valves.
4.	Core Spray Sparger Differential Pressure		1(c)	≤ 3.1 psid greater (less negative) than the normal indicated ΔP at rated core power and flow.	Monitors integrity of CS piping inside vessel (between the nozzle and core shroud).
5.	CS Pump Discharge Flow	Low	1	≥610 gpm (≥ 4.13 inches)	Minimum flow bypass line is closed when low flow signal is not present.
6.	Core Spray Logic Power Failure Monitor		1	Not Applicable	Monitors availability of power to logic system.

*This trip function shall be ≤500 psig.

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-6 and items in Table 4.2-6.

b.1. When any CCCS subsystem is required to be operable by Section 3.5, there shall be two operable trip systems. If the required number of operable channels cannot be met for one of the trip systems, place the inoperable channel in the tripped condition or declare the associated CCCS inoperable within 12 hours. If the required number of operable channels cannot be met for both trip systems, declare the associated CCCS inoperable within 1 hour.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

c. Alarm only. When inoperable, verify that the core spray differential pressure is within limits at least once per 12 hours or, declare the associated core spray loop inoperable.

Table 3.2-7 (Continued)

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System	Trip Setting	Remarks
4.	RBM	Upscale	1(e)(f)		
		Low Trip Setpoint (LTSP)		≤117/125 of full scale	There are three upscale trip levels. Only one is applied over a specified operating core thermal power range. All RBM trips are automatically bypassed below the low power setpoint. The upscale LTSP is applied between the low power and the intermediate power setpoints. The upscale ITSP is applied between the intermediate power setpoint and the high power setpoint. The upscale HTSP is applied above the high power setpoint.
		Intermediate Trip Setpoint (ITSP)		≤111.2/125 of full scale	
		High Trip Setpoint (HTSP)		≤107.4/125 of full scale	
		Power Range Setpoints	Not applicable		
		Low Power Setpoint (LPSP)		≤30% rated core thermal power	Power range setpoints control the enforcement of the appropriate upscale trips over the proper core thermal power ranges. The power signal to the RBM is provided by the APRM.
		Intermediate Power Setpoint (IPSP)		≤65% rated core thermal power	
		High Power Setpoint (HPSP)		≤85% rated core thermal power	
		Bypass Time Delay (td_2)	Not applicable	≤2.0 seconds	RBM bypass time delay is set low enough to assure minimum rod movement while upscale trips are bypassed.
5.	Scram Discharge Volume	High Water Level	1(g)(h)	≤18 gallons	

Notes for Table 3.2-7

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-7 and items in Table 4.2-7.

b.1. For the START & HOT STANDBY position of the Mode Switch, there shall be two operable or tripped systems for each potential trip condition. If the requirements established by the column cannot be met for one of the two trip systems, the condition may exist for up to seven days provided that during that time the operable system is functionally tested immediately and daily thereafter; if this condition lasts longer than seven days, the system shall be tripped. If the requirements established by this column cannot be met for both trip systems, the systems shall be tripped.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

c. One of the four SRM inputs may be bypassed.

d. The SRM and IRM blocks need not be operable in the Run Mode. This function is bypassed when the Mode Switch is placed in the RUN position.

e. The APRM and RBM rod blocks need not be Operable in the Start & Hot Standby Mode (Except 12% APRM Rod Block).

f. The RBM is only required when core thermal power is ≥30% and the limiting condition defined in Section 3.3.F exists.

g. This trip is Operable in Power Operation and Hot Standby Mode, and Refuel Mode when any control rod is withdrawn. Not applicable to control rods removed per Specification 3.10.E.

h. Withdrawal of control rods is not permitted during required surveillance testing.

Table 3.2-8 (cont.)

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Action to be taken if there are not two operable or tripped trip systems	Remarks
5.	Main Steam Line Radiation Monitor	Hi	2	≤3 times normal full power background (e)	Isolate the mechanical vacuum pump and the gland seal condenser exhauster	One trip per trip logic system will isolate the mechanical vacuum pump and the gland seal condenser exhauster.

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-8 and items in Table 4.2-8.

b.1. Whenever the systems are required to be operable, there shall be two operable or tripped trip systems. If this cannot be met, the indicated action shall be taken.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

c. In the event that both off-gas post treatment radiation monitors become inoperable, the reactor shall be placed in the Cold Shutdown within 24 hours unless one monitor is sooner made operable, or adequate alternative monitoring facilities are available.

d. From and after the date that one of the two off-gas post treatment radiation monitors is made or found to be inoperable, continued reactor power operation is permissible during the next fourteen days (the allowable repair time), provided that the inoperable monitor is tripped in the downscale position.

e. Within 24 hours prior to the planned start of the hydrogen injection test 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 test. The background radiation level and associated trip setpoints may be adjusted during the test 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 establishing reactor power levels below 20% rated power.

Table 3.2-9

INSTRUMENTATION WHICH INITIATES RECIRCULATION PUMP TRIP

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System	Trip Setting	Remarks
1.	Reactor Vessel Water Level (ATWS RPT)[c]	Low (Level 2)	2[b1g]	≥ -47 inches H_2O	Power must be reduced and the mode switch placed in a mode other than the RUN Mode.
2.	Reactor Pressure (ATWS RPT)	High	2[b1g]	≤ 1095 psig	Power must be reduced and the mode switch placed in a mode other than the RUN Mode.
3.	EOC - RPT[d]	1. Turbine Stop Valve Closure 2. Turbine Control Valve Fast Closure	2[e][f1]	1. Stop Valve ≤ 90% Open 2. Control Valve Hydraulic Press Trip Point	Trips recirculation pumps on turbine control valve fast closure or stop valve closure when reactor is > 30%.[e]

(a) The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-9 and items in Table 4.2-9.

(b)1. Whenever the reactor is in the RUN Mode, there shall be two operable trip systems for each parameter for each operating recirculation pump. If the required number of operable channels cannot be met for one of the trip systems, place the inoperable channel in the tripped condition or take the indicated action within 14 days. If the required number of opecable channels cannot be met for both trip systems, take the indicated action within 1 hour.

(b)2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances p. or to entering other applicable actions.

(c) Anticipated Transients Without Scram - Recirculation Pump Trip

(d) End of Cycle - Recirculation Pump Trip

(e) Either of these two EOC - RPT systems can trip both recirculation pumps. Each EOC - RPT system will trip if 2-out-of-2 fast closure signals or 2-out-of-2 stop valve signals are received.

(f)1. The requirement for these channels applies from EOC-2000 MWD/t to EOC. The RPT system may be placed an inoperable status for up to 2 hours to provide the required monthly surveillance. If one EOC-RPT system is inoperable longer than 72 hours or if both EOC-RPT systems are simultaneously inoperable, an orderly power reduction will be immediately initiated and reactor power will be <30% within the next 6 hours.

(f)2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

(g) Either of these two ATWS-RPT systems can trip both recirculation pumps. Each ATWS-RPT system will trip if 2-out-of-2 reactor low water level signals or 2-out-of-2 reactor high pressure signals are received.

Table 3.2-10

INSTRUMENTATION WHICH MONITORS LEAKAGE INTO THE DRYWELL

Ref. No. (a)	Instrument (c)	Required Operable Channels per System	Setting	Remarks
1	Drywell Equipment Drain Sump Flow Integrator	1(b)(d)	Tech Spec 3.6.G.1.	The Limiting Conditions for operation of the Leakage Detection System are provided in Section 3.6.G.
2	Drywell Floor Drain Sump Flow Integrator	1(b)(d)	Tech Spec 3.6.G.1.	
3	Scintillation Detector for Monitoring Air Particulates	1(d)	(e)	
4	Scintillation Detector for Monitoring Radioiodine	1(d)	(e)	
5	GM Tubes for Monitoring Noble Gases	1(d)	(e)	

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-10 and items in Table 4.2-10.

b.1. Whenever the systems are required to be operable, there shall be one operable or tripped system. If this cannot be met, the indicated action shall be taken.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

c. The two flow integrators, one for the equipment drain sump and the other for the floor drain sump, comprise one basic instrument system. Two sodium-iodide scintillation detectors, one for monitoring air particulates and one for monitoring radioiodine, comprise two basic instrument systems. A beta sensitive GM detector for monitoring noble gases comprises a fourth basic instrument system. An alternate system to determine the leakage flow is a manual system whereby the time between sump pump starts is monitored. This time interval will determine the leakage flow because the volume of the sump is known.

d. For administrative information; performs no control function.

e. High setpoint alarm will be set three times above background radiation. Failure alarm will be set below background radiation. Specific values will be established during system startup.

NOTES FOR TABLE 3.2-11

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-11 and items in Table 4.2-11.

b. Limiting Conditions for Operation for the Neutron Monitoring System are listed in Table 3.2-7.

c.1. With one or more of the monitoring channels inoperable, either restore the inoperable channel(s) to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours.

Continued operation is permissible for seven days from and after the date that one of these parameters is not indicated in the control room. Surveillance of local panels will be substituted for indication in the control room during the seven days.

c.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

d. Drywell and Suppression Chamber Pressure are each recorded on the same recorders. Each output channel has its own recorder.

Drywell and Suppression Chamber air temperature and suppression chamber water temperature are all recorded on the same recorders. Each output channel has its own recorder. Each recorder takes input from several temperature elements.

Hydrogen and Oxygen are indicated on one recorder. The recorder has two pens, one pen for each parameter.

Each channel of the post LOCA radiation monitoring system includes two detectors; one located in the drywell and the other in the suppression chamber. Each detector feeds a signal to a separate log count rate meter. The meter output goes to a two pen recorder. One high radiation level alarm is provided per channel and annunciation of alarm is provided in the control room.

High Range Drywell Pressure and High Range Drywell Radiation are recorded on the same recorders. Each output channel has its own recorder.

e.1. In the event that all indications of this parameter is disabled and such indication cannot be restored in six (6) hours, an orderly shutdown shall be initiated and the reactor shall be in a Hot Shutdown condition in six (6) hours and a Cold Shutdown condition in the following eighteen (18) hours.

e.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

f.1. If either the primary or secondary indication is inoperable, the torus temperature will be monitored at least once per shift to observe any unexplained temperature increase which might be indicative of an open SRV. With both the primary and secondary monitoring channels of two or more SRVs inoperable either restore sufficient inoperable channels such that no more than one SRV has both primary and secondary channels inoperable within 7 days or be in at least hot shutdown within the next 12 hours.

f.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

g.1. With the plant in the power operation, startup, or hot shutdown condition and with the number of operable channels less than the required operable channels, initiate the preplanned alternate method of monitoring the appropriate parameter within 72 hours and:

a. either restore the inoperable channel(s) to operable status within 7 days of the event, or

b. prepare and submit a special report to the NRC pursuant to Specification 6.9.2, within 14 days following the event outlining the action taken, the cause of the inoperability, and the plans and schedule for restoring the system to operable status.

g.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

h. A channel contains two detectors: one for mid-range noble gas, and one for high range noble gas. Both detectors must be operable to consider the channel operable.

i. Instrumentation shall be operable with continuous sampling capability within 30 minutes of an ECCS actuation during a LOCA. See Section 3.7.A.6.c for the LIMITING CONDITION FOR OPERATION.

TABLE 3.2-12

INSTRUMENTATION WHICH INITIATES THE DISCONNECTION
OF OFFSITE POWER SOURCES

Ref. No. (a)	Instrument (b)	Required Operable Channels	Channels Required To Trip	Trip Setting	Action to be Taken if the Number of Required Operable Channels is Not Met
1	4.16 kv Emergency Bus Undervoltage Relay (Loss of Voltage Condition)	2/Bus	2/Bus	greater than or equal to 2800 volts. At 2800 volts time delay will be less than or equal to 6.5 sec.	(c)
2	4.16 kv Emergency Bus Undervoltage Relay (Degraded Voltage Condition)	2/Bus	2/Bus	greater than or equal to 3280 volts. At 3280 volts time delay will be less than or equal to 21.5 sec.	(c)

NOTES FOR TABLE 3.2-12

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-12 and items in Table 4.2-12.

b. This instrumentation is required to be operable during reactor startup, power operation, and hot shutdown.

c.1. With the number of operable channels one less than the required operable channels, operation may proceed until performance of the next required instrument functional test provided a trip signal is placed in the LOSP lock-out relay logic for the applicable inoperable channel.

c.2 One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

Table 3.2-14

INSTRUMENTATION WHICH ARMS LOW LOW SET S/RV SYSTEM

Ref No.[a]	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System	Trip Setting	Remarks
1.	Reactor Vessel Steam Dome Pressure	High	2[b1]	≤ 1054 psig	
2.	Relief/Safety Valve Tailpipe Pressure	High	2/valve	85, + 15, -5 psig	The limiting condition of operation for these switches is provided in Specification 3.6.H.1.

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in table 3.2-14 and items in table 4.2-14.

b.1. With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place the inoperable channel in the tripped condition or declare the associated system inoperable within one hour. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, declare the associated system inoperable within one hour.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

Table 4.2-1

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
1	Reactor Vessel Water Level (Levels 1, 2, and 3)	Once/shift	Once/quarter	Once/operating cycle
2	Reactor Vessel Steam Dome Pressure (Shutdown Cooling Mode)	Once/shift	Once/quarter	Once/operating cycle
3	Drywell Pressure	Once/shift	Once/quarter	Once/operating cycle
4	Main Steam Line Radiation	None	Once/week (e)	Every 3 months (f)
5	Main Steam Line Pressure	None	N/A	Every 3 months
6	Main Steam Line Flow	Once/shift	Once/quarter	Once/operating cycle
7	Main Steam Line Tunnel Temperature	Once/shift	Once/quarter	Once/operating cycle
8	Reactor Water Cleanup System Differential Flow	None	N/A	Every 3 months
9	Reactor Water Cleanup Area Temperature	Once/shift	Once/quarter	Once/operating cycle

Table 4.2-1 (Cont'd)

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
10	Reactor Water Cleanup Area Ventilation Differential Temperature	Once/shift	Once/quarter	Once/operating cycle
11	Condenser Vacuum	None	N/A	Every 3 months
12	Drywell Radiation	Once/shift	Once/quarter[e]	Once/operating cycle
13	HPCI Emergency Area Cooler Ambient Temperature	Once/shift	Once/quarter	Once/operating cycle
14.	HPCI Steam Supply Pressure	Once/shift	Once/quarter	Once/operating cycle
15.	HPCI Steam Line ΔP (Flow)	Once/shift	Once/quarter	Once/operating cycle
16.	HPCI Turbine Exhaust Diaphragm Pressure	Once/shift	Once/quarter	Once/operating cycle
17	HPCI Suppression Chamber Area Ambient Temperature	Once/shift	Once/quarter	Once/operating cycle
18	HPCI Suppression Chamber Area Differential Air Temperature	Once/shift	Once/quarter	Once/operating cycle
19	RCIC Emergency Area Cooler Ambient Temperature	Once/shift	Once/quarter	Once/operating cycle
20	RCIC Steam Supply Pressure	Once/shift	Once/quarter	Once/operating cycle
21	RCIC Steam Line ΔP (Flow)	Once/shift	Once/quarter	Once/operating cycle
22	RCIC Turbine Exhaust Diaphragm Pressure	Once/shift	Once/quarter	Once/operating cycle

Table 4.2-1 (Cont'd)

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
23	RCIC Suppression Chamber Area Ambient Temperature	Once/shift	Once/quarter	Once/operating cycle
24	RCIC Suppression Chamber Area Differential Air Temperature	Once/shift	Once/quarter	Once/operating cycle

Notes for Table 4.2-1

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-1 and items in Table 3.2-1.

b.1. Instrument functional tests are not required when the instruments are not required to be operable or are tripped. However, if functional tests are missed, they shall be performed prior to returning the instrument to an operable status.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

c. Calibrations are not required when the instruments are not required to be operable. However, if calibrations are missed, they shall be performed prior to returning the instrument to an operable status.

d. Deleted.

e. This instrumentation is exempted from the instrument functional test definition. This instrument functional test will consist of injecting a simulated electrical signal into the measurement channels.

f. Standard current source c[illegible] which provides an instrument channel alignment. Calibration using a radiation source shall be made once per operating cycle.

Logic system functional tests and simulated automatic actuation shall be performed once each operating cycle for the following:

1. Main Steam Line Isolation Valves
2. Main Steam Line Drain Valves
3. Reactor Water Sample Valves
4. RHR - Isolation Valve Control
5. Shutdown Cooling Valves
6. Head Spray
7. Drywell Equipment Sump Discharge to Radwaste
8. Reactor Water Cleanup Isolation
9. Drywell Isolation Valves
10. TIP Withdrawal
11. Atmospheric Control Valves
12. Sump Drain Valves
13. Standby Gas Treatment
14. Reactor Building Isolation

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

Table 4.2-2

Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Initiates or Controls HPCI

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
1	Reactor Vessel Water Level (Level 2)	Once/shift	Once/quarter	Once/operating cycle
2	Drywell Pressure	Once/shift	Once/quarter	Once/operating cycle
3	HPCI Turbine Overspeed	None	N/A	Once/operating cycle
4	HPCI Turbine Exhaust Pressure	Once/shift	Once/quarter	Once/operating cycle
5	HPCI Pump Suction Pressure	Once/shift	Once/quarter	Once/operating cycle
6	Reactor Vessel Water Level (Level 8)	Once/shift	Once/quarter	Once/operating cycle
7	HPCI Pump Discharge Flow	Once/shift	Once/quarter	Once/operating cycle
8	Deleted			
9	Deleted			

Table 4.2-2 (Cont'd)

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
10	Deleted			
11	Deleted			
12	Deleted			
13	Deleted			
14	Condensate Storage Tank Level	None	N/A	Every 3 months
15	Suppression Chamber Water Level	Once/shift	Once/quarter	Once/operating cycle
16	HPCI Logic Power Failure Monitor	None	Once/operating cycle	None

Notes for Table 4.2-2

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-2 and items in Table 3.2-2.

b. Instrument functional tests are not required when the instruments are not required to be operable or are tripped. However, if functional tests are missed, they shall be performed prior to returning the instrument to an operable status.

c. Calibrations are not required when the instruments are not required to be operable. However, if calibrations are missed, they shall be performed prior to returning the instrument to an operable status.

d. Deleted.

Logic system functional tests and simulated automatic actuation shall be performed once each operating cycle for the following:

1. HPCI Subsystem
2. HPCI Subsystem Auto Isolation
3. Diesel Generator Initiation
4. Area Cooling for Engineered Safeguard Systems

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

Table 4.2 3

Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Initiates or Controls RCIC

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
1	Reactor Vessel Water Level (Level 2)	Once/shift	Once/quarter	Once/operating cycle
2	RCIC Turbine Overspeed			
	Electrical/	None	N/A	Once/operating cycle
	Mechanical	None	N/A	Once/operating cycle
3	RCIC Turbine Exhaust Pressure	Once/shift	Once/quarter	Once/operating cycle
4	RCIC Pump Suction Pressure	Once/shift	Once/quarter	Once/operating cycle
5	Reactor Vessel Water Level (Level 8)	Once/shift	Once/quarter	Once/operating cycle
6	RCIC Pump Discharge Flow	Once/shift	Once/quarter	Once/operating cycle
7	Deleted			
8	Deleted			

TABLE 4.2-3 (Continued)

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
9	Deleted			
10	Deleted			
11	Deleted			
12	Deleted			
13	PCIC Logic Power Failure Monitor	None	Once/operating cycle	None
14	Condensate Storage Tank Level	None	Once/quarter	Every 3 months
15	Suppression Pool Water Level	None	Once/quarter	Every 3 months

Notes for Table 4.2-3

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-3 and items in Table 3.2-3.

b. Instrument functional tests are not required when the instruments are not required to be operable or are tripped. However, if functional tests are missed, they shall be performed prior to returning the instrument to an operable status.

Table 4.2-4

Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Initiates or Controls ADS

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)	
1	Reactor Vessel Water Level (Level 3)	Once/shift	Once/quarter	Once/operating cycle	I
	Reactor Vessel Water Level (Level 1)	Once/shift	Once/quarter	Once/operating cycle	I
2	Drywell Pressure	Once/shift	Once/quarter	Once/operating cycle	I
3	RHR Pump Discharge Pressure	Once/shift	Once/quarter	Once/operating cycle	I
4	CS Pump Discharge Pressure	Once/shift	Once/quarter	Once/operating cycle	I
5	Auto Depressurization Low Water Level Timer	None	N/A	Once/operating cycle	
6	Auto Depressurization Timer	None	N/A	Once/operating cycle	
7	Automatic Blowdown Control Power Failure Monitor	None	Once/operating cycle	None	

Notes for Table 4.2-4

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-4 and items in Table 3.2-4.

Table 4.2-5

Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Initiates or Controls the LPCI Mode of RHR

Ref. No. (a)		Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)	
1		Reactor Vessel Water Level (Level 1)	Once/shift	Once/quarter	Once/operating cycle	I
2		Drywell Pressure	Once/shift	Once/quarter	Once/operating cycle	I
3	a.	Reactor Vessel Steam Dome Pressure	Once/shift	Once/quarter	Once/operating cycle	I
3	b.	Reactor Vessel Steam Dome Pressure	Once/shift	Once/quarter	Once/operating cycle	I
4		Reactor Shroud Water Level (Level 0)	Once/shift	Once/quarter	Once/operating cycle	
5		LPCI Cross Connect Valve Open Annunciator	None	Once/Operating cycle	None	
6		RHR (LPCI) Pump Flow	Once/shift	Once/quarter	Once/operating cycle	I
7		RHR (LPCI) Pump Start Timers	None	N/A	Once/operating cycle	
8		Valve Selection Timers	None	N/A	Once/operating cycle	
9		RHR Relay Logic Power Failure Monitor	None	Once/operating cycle	None	

Table 4.2-6

Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Initiates or Controls Core Spray

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)	
1	Reactor Vessel Water Level (Level 1)	Once/shift	Once/quarter	Once/operating cycle	I
2	Drywell Pressure	Once/shift	Once/quarter	Once/operating cycle	I
3	Reactor Vessel Steam Dome Pressure	Once/shift	Once/quarter	Once/operating cycle	I
4	Core Spray Sparger Differential Pressure	Once/day	N/A	Once/operating cycle	
5	CS Pump Discharge Flow	Once/shift	Once/quarter	Once/operating cycle	I
6	Core Spray Logic Power Failure Monitor	None	Once/operating cycle	None	

Notes for Table 4.2-6

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-6 and items in Table 3.2-6.

Table 4.2-7

Check, Functional Test, and Calibration Minimum Frequency for Neutron Monitoring Instrumentation Which Initiates Control Rod Blocks

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency (b)	Instrument Functional Test Minimum Frequency (c)	Instrument Calibration Minimum Frequency (d)
1	SOURCE RANGE MONITORS			
	a. Detector not full in	NA	S/U[f], W	NA
	b. Upscale	NA	S/U[f], W	R
	c. Inoperative	NA	S/U[f], W	NA
	d. Downscale	NA	S/U[f], W	R
2	INTERMEDIATE RANGE MONITORS			
	a. Detector not full in	NA	S/U[f], W[e]	NA
	b. Upscale	NA	S/U[f], W[e]	R
	c. Inoperative	NA	S/U[f], W[e]	NA
	d. Downscale	NA	S/U[f], W[e]	R
3	APRM			
	a. Flow Referenced Simulated Thermal Power-Upscale	NA	S/U[f], Q	R
	b. Inoperative	NA	S/U[f], Q	NA
	c. Downscale	NA	S/U[f], Q	R
	d. Neutron Flux - High, 12%	NA	S/U[f], Q	R
4	ROD BLOCK MONITOR			
	a. Upscale	NA	S/U[f], Q	R
	b. Inoperative	NA	S/U[f], Q	NA
	c. Downscale	NA	S/U[f], Q	R
5	SCRAM DISCHARGE VOLUME			
	a. Water Level-High	NA	Q	R

Notes for Table 4.2-7

a. The column titled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-7 and items in Table 3.2-7.

b. Deleted.

Table 4.2-8

Check, Functional Test, and Calibration Minimum Frequency for Radiation Monitoring Systems Which Limit Radioactivity Release

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency (b)	Instrument Functional Test Minimum Frequency (c)	Instrument Calibration Minimum Frequency (d)
1	Off-gas Post Treatment Radiation Monitors	Once/day	Once/month (f)	Every 3 months
2	Refueling Floor Exhaust Vent Radiation Monitors	Once/day	Once/quarter (f)	Every 3 months
3	Reactor Building Exhaust Vent Radiation Monitors	Once/day	Once/quarter (f)	Every 3 months
4	Control Room Intake Radiation Monitors	Once/day	Once/quarter (f)	Every 3 months
5	Main Steam Line Radiation Monitors	None	Once/week (f)	Every 3 months (g)

Notes for Table 4.2-8

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-8 and items in Table 3.2-8.

b. Instrument checks are not required when these instruments are not required to be operable or are tripped. However, if instrument checks are missed, they shall be performed prior to returning the instrument to an operable status.

c. Instrument functional tests are not required when the instruments are not required to be operable or are tripped. However, if instrument functional tests are missed, they shall be performed prior to returning the instrument to an operable status.

d. Instrument calibrations are not required when the instruments are not required to be operable or are tripped. However, if instrument calibrations are missed, they shall be performed prior to returning the instrument to an operable status.

e. Deleted.

f. This instrumentation is exempted from the instrument functional test definition. This instrument functional test will consist of injecting a simulated electrical signal into the measurement channels.

g. Standard current source used which provides an instrument channel alignment. Calibration using a radiation source shall be made once per operating cycle.

Logic system functional tests and simulated automatic actuation shall be performed once each operating cycle for the following:

1. Secondary Containment Actuation

Table 4.2-9

CHECK AND CALIBRATION MINIMUM FREQUENCY FOR INSTRUMENTATION
WHICH INITIATES RECIRCULATION PUMP TRIP

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency	Instrument Calibration Minimum Frequency
1	Reactor Vessel Water Level (ATWS RPT)(b)	Once/shift	Once/quarter	Once/operating cycle
2	Reactor Pressure (ATWS RPT)	Once/shift	Once/quarter	Once/operating cycle
3	EOC - RPT Trip			
	a) Initiating Logic	None	Once/quarter	None
	b) Breakers	None	Once/operating cycle	None
	c) Response Time RPT logic + Breakers(c)	None	None	Once/operating cycle

Notes for Table 4.2-9

(a) The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-9 and items in Table 4.2-9

(b) An ATWS recirculation pump trip logic system functional test shall be performed once per operating cycle.

(c) The EOC-RPT System Response Time shall be that time interval from initial signal generation by the associated turbine stop valve limit switch or from when the turbine control valve hydraulic control oil pressure drops below the pressure switch setpoint to complete suppression of the electric arc between the fully-open contacts of the recirculation pump circuit breaker. The response time may be measured by any series of sequential, overlapping, or total steps such that the entire response time is measured. Each test shall include at least the logic of one type of channel input, turbine control valve fast closure or turbine stop valve closure, such that both types of channel inputs are tested at least once per 36 months. The EOC-RPT System Response Time acceptance criteria associated with turbine stop valve closure shall be K 155 milliseconds; the EOC-RPT System Response Time acceptance criteria associated with the turbine control valve fast closure shall be K 175 milliseconds.

Table 4.2-10

Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Monitors Leakage into the Drywell

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency (b)	Instrument Functional Test Minimum Frequency (c)	Instrument Calibration Minimum Frequency (d)	
1	Drywell Equipment Drain Sump Flow Integrator	Once/day	Once/month	Every 3 months	I
2	Drywell Floor Drain Sump Flow Integrator	Once/day	Once/month	Every 3 months	I
3	Scintillation Detector for Monitoring Air Particulates	Once/day	Once/month	Every 6 months	I
4	Scintillation Detector for monitoring Radioiodine	Once/day	Once/month	Every 6 months	I
5	GM Tubes for Monitoring Noble Gases	Once/day	Once/month	Every 6 months	I

Notes for Table 4.2-10

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-10 and items in Table 3.2-10.

b. Instrument checks are not required when these instruments are not required to be operable or are tripped. However, if instrument checks are missed, they shall be performed prior to returning the instrument to an operable status.

c. Instrument functional tests are not required when the instruments are not required to be operable or are tripped. However, if instrument functional tests are missed, they shall be performed prior to returning the instrument to an operable status.

Notes for Table 4.2-10 (Cont'd)

d. Instrument calibrations are not required when the instruments are not required to be operable or are tripped. However, if instrument calibrations are missed, they shall be performed prior to returning the instrument to an operable status.

e. Deleted.

Table 4.2-14

CHECK, FUNCTIONAL TEST, AND CALIBRATION MINIMUM FREQUENCY FOR INSTRUMENTATION WHICH ARMS THE LOW LOW SET S/RV SYSTEM

Ref. No.[a]	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency[b]	Instrument Calibration Minimum Frequency[c]
1	Reactor Vessel Steam Dome Pressure	Once/shift	Once/quarter	Once/operating cycle
2	Relief/Safety Valve Tailpipe Pressure	N/A	Once/quarter(d)	Once/operating cycle(e)

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in table 4.2-14 and items in table 3.2-14.

b. Instrument functional tests are not required when the instruments are not required to be operable or are tripped. However, if functional tests are missed, they shall be performed prior to returning the instrument to an operable status.

c. Calibrations are not required when the instruments are not required to be operable. However, if calibrations are missed, they shall be performed prior to returning the instrument to an operable status.

d. See section 4.6.H.1.e.1 for exceptions to this pressure switch functional test frequency.

e. See section 4.6.H.1.e.2.

3.2 PROTECTION INSTRUMENTATION

In addition to the Reactor Protection System (RPS) instrumentation which initiates a reactor scram, protective instrumentation has been provided which initiates action to mitigate the consequences of accidents which are beyond the operators ability to control, or terminates operator errors before they result in serious consequences. This set of Specifications provides the limiting conditions for operation of the instrumentation: (a) which initiates isolation, (b) which initiates or controls the core and containment cooling systems, (c) which initiates control rod blocks, (d) which initiates protective action, (e) which monitors leakage into the drywell and (f) which provides surveillance information. The objectives of these specifications are (i) to assure the effectiveness of the protective instrumentation when required by preserving its capability to tolerate a single failure of any component of such systems even during periods when portions of such systems are out of service for maintenance, and (ii) to prescribe the trip settings required to assure adequate performance. When necessary, one channel may be removed from service for brief intervals to conduct required functional tests and calibrations.

Footnotes are provided in each LCO table (Tables 3.2-1 through 3.2-14) which dictate the allowable time interval. One instrument channel may be considered inoperable for up to 6 hours in order to perform required surveillances for this instrumentation, prior to entering other applicable actions.

A. Isolation Actuation Instrumentation (Table 3.2-1)

Isolation valves are installed in those lines which penetrate the primary containment and must be isolated during an accident. Actuation of these valves is initiated by instrumentation shown in Table 3.2-1 which senses the conditions for which isolation is required. Such instrumentation must be available whenever primary containment integrity is required. The objective is to isolate the primary containment so that the guidelines of 10 CFR 100 are not exceeded during an accident.

1. Reactor Vessel Water Level

a. Reactor Vessel Water Level Low (Level 3) (Narrow Range)

The reactor water level instrumentation is set to trip when reactor water level is approximately 14 feet above the top of the active fuel. This level is referred to as Level 3 in the Technical Specifications and corresponds to a reading of 0.0 inches on the Narrow Range scale. This trip initiates Group 2 and 6 isolation but does not trip the recirculation pumps.

b. Reactor Vessel Water Level Low Low (Level 2)

The reactor water level instrumentation is set to trip when reactor water level is approximately 9 feet above the top of the active fuel. This level is referred to as Level 2 in the Technical Specifications and corresponds to a reading of -47 incnes. This trip initiates Group 5 isolation, starts the standby gas treatment system, and initiates secondary containment isolation.

3.2.A.7. Main Steam Line Tunnel Temperature High (Continued)

with the resultant small release of radioactivity, gives isolation before the guidelines of 10 CFR 100 are exceeded.

8. Reactor Water Cleanup System Differential Flow High

Gross leakage (pipe break) from the reactor water cleanup system is detected by measuring the difference of flow entering and leaving the system. The set point is low enough to ensure prompt isolation of the cleanup system in the event of such a break but, not so low that spurious isolation can occur due to normal system flow fluctuations and instrument noise. Time delay relays are used to prevent the isolation signal which might be generated from the initial flow surge when the cleanup system is started or when operational system adjustments are made which produce short term transients.

9. Reactor Water Cleanup Area Temperature High and

10. Reactor Water Cleanup Area Ventilation Differential Temperature High

Leakage in the high temperature process flow of the reactor water cleanup system external to the primary containment will be detected by temperature sensing elements. Temperature sensors are located in the inlet and outlet ventilation ducts to measure the temperature difference. Local ambient temperature sensors are located in the compartment containing equipment and piping for this system. An alarm in the main control room will be set to annunciate a temperature rise corresponding to a leakage within the identified limit. In addition to annunciation, a high cleanup room temperature will actuate automatic isolation of the cleanup system.

11. Condenser Vacuum Low

The Bases for Condenser Vacuum Low are discussed in The Bases for Specification 2.1.A.7.

12. Drywell Radiation

When drywell radiation reaches the setpoint ($\leq$ 138 R/hr), the purge and vent valves are automatically closed, thus isolating the containment atmosphere from the outside environment.

13. HPCI Emergency Area Cooler Ambient Temperature High

High ambient temperature in the HPCI equipment room near the emergency area cooler could indicate a break in the HPCI system turbine steam line. The automatic closure of the HPCI steam line valves prevents the excessive loss of reactor coolant and the release of significant amounts of radioactive material from the nuclear system process barrier. The high temperature setting $\leq$ 169°F was selected to be far enough above anticipated normal HPCI system operational levels to avoid spurious isolation but low enough to provide timely detection of HPCI turbine steam line break.

3.2.A.14. HPCI Steam Supply Pressure Low

Low pressure in the HPCI steam line could indicate a break in the HPCI steam line. Therefore, the HPCI steam line isolation valves are automatically closed. The steam line low pressure function is provided so in the event that a gross rupture of the HPCI steam line occurred upstream from the high flow sensing location, thus negating the high flow indicating function, isolation would be effected on low pressure. The allowable value of $\geq$ 100 psig is selected at a pressure sufficiently high enough to prevent turbine stall.

15. HPCI Steam Line ΔP (Flow) High

HPCI steam line high flow could indicate a break in the HPCI turbine steam line. The automatic closure of the HPCI steam line isolation valves prevents the excessive loss of reactor coolant and the release of significant amount of radioactive materials from the nuclear system process barrier. Upon detection of HPCI steam line high flow, the HPCI turbine steam line is isolated. The high steam flow trip setting of 303% flow was selected high enough to avoid spurious isolation, i.e., above the high steam flow rate encountered during turbine starts. The setting was selected low enough to provide timely detection of a HPCI turbine steam line break.

16. HPCI Turbine Exhaust Diaphragm Pressure High

High pressure in the HPCI turbine exhaust could indicate that the turbine rotor is not turning, thus allowing reactor pressure to act on the turbine exhaust line. The HPCI steam line isolation valves are automatically closed to prevent overpressurization of the turbine exhaust line. The turbine exhaust diaphragm pressure trip setting of $\leq$ 20 psig is selected high enough to avoid isolation of the HPCI if the turbine is operating, yet low enough to effect isolation before the turbine exhaust line is unduly pressurized.

17. HPCI Suppression Chamber Area Ambient Temperature High

A temperature of 169°F will initiate a timer to isolate the HPCI turbine steam line.

18. HPCI Suppression Chamber Area Differential Air Temperature High

A differential air temperature greater than the trip setting of $\leq$ 42°F between the inlet and outlet ducts which ventilate the suppression chamber area will initiate a timer to isolate the HPCI turbine steam line.

19. RCIC Emergency Area Cooler Ambient Temperature High

High ambient temperature in the RCIC equipment room near the emergency area cooler could indicate a break in the RCIC system turbine steam line. The automatic closure of the RCIC steam line valves prevents the excessive loss of reactor coolant and the release of significant amounts of radioactive material from the nuclear system process barrier. The high temperature setting of $\leq$ 169°F was selected to be far enough above anticipated normal RCIC system operational levels to avoid spurious isolation but low enough to provide timely detection of a RCIC turbine steam line break.

3.2.A.20. RCIC Steam Supply Pressure Low

Low pressure in the RCIC steam supply could indicate a break in the RCIC steam line. Therefore, the RCIC steam supply isolation valves are automatically closed. The steam line low pressure function is provided so that in the event a gross rupture of the RCIC steam line occurred upstream from the high flow sensing location, thus negating the high flow indicating function, isolation would be effected on low pressure. The isolation setpoint of $\geq$ 60 psig is chosen at a pressure below that at which the RCIC turbine can effectively operate.

21. RCIC Steam Line (ΔP) Flow High

RCIC turbine high steam flow could indicate a break in the RCIC turbine steam line. The automatic closure of the RCIC steam line isolation valves prevents the excessive loss of reactor coolant and the release of significant amounts of radioactive materials from the nuclear system process barrier. Upon detection of RCIC turbine high steam flow the RCIC turbine steam line is isolated. The high steam flow trip setting of 306% flow was selected high enough to avoid spurious isolation, i.e., above the high steam flow rate encountered during turbine starts. The setting was selected low enough to provide timely detection of a RCIC turbine steam line break.

22. RCIC Turbine Exhaust Diaphragm Pressure High

High pressure in the RCIC turbine exhaust could indicate that the turbine rotor is not turning, thus allowing reactor pressure to act on the turbine exhaust line. The RCIC steam line isolation valves are automatically closed to prevent overpressurization of the turbine exhaust line. The turbine exhaust diaphragm pressure trip setting of $\leq$ 20 psig is selected high enough to avoid isolation of the RCIC if the turbine is operating, yet low enough to effect isolation before the turbine exhaust line is unduly pressurized.

23. RCIC Suppression Chamber Area Ambient Temperature High

As in the RCIC equipment room, and for the same reason, a temperature of $\leq$ 169°F will initiate a timer to isolate the RCIC turbine steam line.

24. Suppression Chamber Area Differential Air Temperature High

A high differential air temperature between the inlet and outlet ducts which ventilate the suppression chamber area will initiate a timer to isolate the RCIC turbine steam line.

B. Instrumentation Which Initiates or Controls HPCI (Table 3.2-2)

1. Reactor Vessel Water Level Low Low (Level 2)

The reactor vessel water level instrumentation setpoint which initiates HPCI is $\geq$ -47 inches. This level is approximately 9 feet above the top of the active fuel and in the Technical Specifications is referred to as Level 2. The reactor vessel low water level setting for HPCI system initiation is selected high enough above the active fuel to start the HPCI system in time both to prevent excessive fuel clad temperatures and to prevent more than a small fraction of the core from reaching the temperature at which gross fuel failure occurs. The water level setting is far enough below normal levels that spurious HPCI system startups are avoided.

2. Drywell Pressure High

The drywell pressure which initiates HPCI is $\leq$ 2 psig. High drywell pressure could indicate a failure of the nuclear system process barrier. This pressure is selected to be as low as possible without inducing spurious HPCI system startups. This instrumentation serves as a backup to the water level instrumentation described above.

3.2.B.3. HPCI Turbine Overspeed

The HPCI turbine is automatically shut down by tripping the HPCI turbine stop valve closed when the 5000 rpm setpoint on the mechanical governor is reached. A turbine overspeed trip is required to protect the physical integrity of the turbine.

4. HPCI Turbine Exhaust Pressure High

When HPCI turbine exhaust pressure reaches the setpoint (≤ 146 psig) the HPCI turbine is automatically shut down by tripping the HPCI stop valve closed. HPCI turbine exhaust high pressure is indicative of a condition which threatens the physical integrity of the exhaust line.

5. HPCI Pump Suction Pressure Low

The pressure switch is used to detect low HPCI system pump suction pressure and is set to trip the HPCI turbine at ≤ 12.6 inches of mercury vacuum. This setpoint is chosen to prevent pump damage by cavitation.

6. Reactor Vessel Water Level High (Level 8)

A reactor water level of +56.5 inches is indicative that the HPCI system has performed satisfactorily in providing makeup water to the reactor vessel. The reactor vessel high water level setting which trips the HPCI turbine is near the top of the steam separators and is sufficient to prevent gross moisture carryover to the HPCI turbine. Two analog differential pressure transmitters trip to initiate a HPCI turbine shutdown.

7. HPCI Pump Discharge Flow High

To prevent damage by overheating at reduced HPCI system pump flow, a pump discharge minimum flow bypass is provided. The bypass is controlled by an automatic, D. C. motor-operated valve. A high flow signal from a flow meter downstream of the pump on the main HPCI line will cause the bypass valve to close. Two signals are required to open the valve: A HPCI pump discharge pressure transmitter high differential pressure signal must be received to act as a permissive to open the bypass valve in the presence of a low flow signal from the differential pressure transmitter.

NOTE:

Because the steam supply line to the HPCI turbine is part of the nuclear system process barrier, the following conditions (8-13) automatically isolate this line, causing shutdown of the HPCI system turbine.

8. Deleted

3.2.B.8. Deleted

9. Deleted

10. Deleted

11. Deleted

12. Deleted

3.2.B.13. Deleted

14. Condensate Storage Tank Level Low

The CST is the preferred source of suction for HPCI. In order to provide an adequate water supply, an indication of low level in the CST automatically switches the suction to the suppression chamber. A trip setting of 0 inches corresponds to 10,000 gallons of water remaining in the tank.

15. Suppression Chamber Water Level High

A high water level in the suppression chamber automatically switches HPCI suction to the suppression chamber from the CST.

16. HPCI Logic Power Failure Monitor

The HPCI Logic Power Failure Monitor monitors the availability of power to the logic system. In the event of loss of availability of power to the logic system, an alarm is annunciated in the control room.

C. Instrumentation Which Initiates or Controls RCIC (Table 3.2-3)

1. Reactor Vessel Water Level Low Low (Level 2)

The reactor vessel water level instrumentation setpoint which initiates RCIC is $\geq$ -47 inches. This level is approximately 9 feet above the top of the active fuel and is referred to as Level 2. This setpoint insures that RCIC is started in time to preclude conditions which lead to inadequate core cooling.

2. RCIC Turbine Overspeed

The RCIC turbine is automatically shutdown by tripping the RCIC turbine stop valve closed when the 125% speed at rated flow setpoint on the mechanical governor is reached. Turbine overspeed is indicative of a condition which threatens the physical integrity of the system. An electrical tachometer trip setpoint of 110% also will trip the RCIC turbine stop valve closed.

3. RCIC Turbine Exhaust Pressure High

When RCIC turbine exhaust pressure reaches the setpoint ($\leq$ 45 psig), the RCIC turbine is automatically shut down by tripping the RCIC turbine stop valve closed. RCIC turbine exhaust high pressure is indicative of a condition which threatens the physical integrity of the exhaust line.

4. RCIC Pump Suction Pressure Low

One differential pressure transmitter is used to detect low RCIC system pump suction pressure and is set to trip the RCIC turbine at $\leq$ 12.6 inches of mercury vacuum.

3.2.C.5. Reactor Vessel Water Level High (Level 8)

A high reactor water level trip is indicative that the RCIC system has performed satisfactorily in providing makeup water to the reactor vessel. The reactor vessel high water level setting which trips the RCIC turbine is near the top of the steam separators and sufficiently low to prevent gross moisture carryover to the RCIC turbine. Two differential pressure transmitters trip to initiate a RCIC turbine shutdown. Once tripped the system is capable of automatic reset after the water level drops below Level 8. This automatic reset eliminates the need for manual reset of the system before the operator can take manual control to avoid fluctuating water levels.

6. RCIC Pump Discharge Flow

To prevent damage by overheating at reduced RCIC system pump flow, a pump discharge minimum flow bypass is provided. The bypass is controlled by an automatic, D. C. motor-operated valve. A high flow signal from a flow meter downstream of the pump on the main RCIC line will cause the bypass valve to close. Two signals are required to open the valve: A RCIC pump discharge pressure transmitter high differential pressure signal must be received to act as a permissive to open the bypass valve in the presence of a low flow signal from the differential pressure transmitter.

Note:

Because the steam supply line to the RCIC turbine is part of the nuclear system process barrier, the following conditions (7 - 13) automatically isolate this line, causing shutdown of the RCIC system turbine.

7. Deleted

8. Deleted

3.2.C.9. Deleted

10. Deleted

11. Deleted

12. Deleted

13. RCIC Logic Power Failure Monitor

The RCIC Logic Power Failure Monitor monitors the availability of power to the logic system. In the event of loss of availability of power to the logic system, an alarm is annunciated in the control room.

14. Condensate Storage Tank Level Low

The low CST level signal transfers RCIC suction from the CST to the suppression pool. The setpoint was chosen to ensure an uninterrupted supply of water during suction transfer.

15. Suppression Pool Water Level High

A high water level in the suppression chamber automatically switches RCIC suction from the CST to the suppression pool.

2. Drywell Pressure High

Primary containment high pressure could indicate a break in the nuclear system process barrier inside the drywell. The high drywell pressure setpoint is selected to be high enough to avoid spurious starts but low enough to allow timely system initiation.

3. Reactor Vessel Steam Dome Pressure Low

With an analytical limit of ≥ 300 psig and a nominal trip setpoint of 370 psig, the recirculation discharge valve will close successfully during a LOCA condition.

Once the LPCI system is initiated, a reactor low pressure setpoint of 460 psig produces a signal which is used as a permissive to open the LPCI injection valves. The valves do not open, however, until reactor pressure falls below the discharge head of LPCI.

4.2 PROTECTIVE INSTRUMENTATION

The instrumentation listed in Tables 4.2-1 through 4.2-13 will be functionally tested and calibrated at regularly scheduled intervals. The minimum functional test frequencies and allowable outage times for selected instrumentation related to isolation actuation, ECCS and RCIC actuation, and control rod block have been revised.

The NRC-approved reliability-based methodology in References 1 through 4 provides a basis for these changes and is consistent with similar changes to RPS instrumentation. The frequency of functional testing and calibration for other instrumentation is based on historical methodology (Reference 5).

A. References

1. NEDC-30851P-A, "BWR Owners' Group Technical Specification Improvement Analysis for BWR Reactor Protection System," March 1988.

2. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.

3. NEDC-30936P-A, "BWR Owners' Group Technical Specification Improvement Methodology (with Demonstration for BWR ECCS Actuation Instrumentation) Part 2," June 1987.

4. NEDC-30851P-A, Supplement 1, "Technical Specification Improvement Analysis for BWR Control Rod Block Instrumentation," October 1988.

5. UCRL-50451, "Improving Availability and Readiness of Field Equipment Through Periodic Inspection," Benjamin Epstein, Albert Shiff, July 16, 1968, page 10, Equation (24), Lawerence Radiation Laboratory.

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FIGURE 4.2-1 Deleted

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.5.H. Maintenance of Filled Discharge Pipes Whenever the CS system, LPCI, HPCI, or RCIC are required to be operable, the discharge piping from the pump discharge of these systems to the last block valve shall be filled. The suction of the HPCI pumps shall be aligned to the condensate storage tank.	4.5.H. Maintenance of Filled Discharge Pipes The following surveillance requirements shall be performed to assure that the discharge piping of the CS system, LPCI, HPCI, and RCIC are filled when required: 1. Every month, the discharge piping of the LPCI and CS systems shall be vented from the high point and water flow observed. 2. Following any period where the LPCI or CS systems have not been required to be operable, or have been inoperable, the discharge piping of the system or systems being returned to service shall be vented from the high point prior to return of the system to service. 3. Whenever the HPCI or RCIC system is lined up to take suction from the condensate storage tank, the discharge piping of the HPCI and RCIC shall be vented from the high point of the system and water flow observed on a monthly basis. 4 The level switches which monitor the discharge lines shall be calibrated every 3 months.
I. Minimum River Level 1. If the water level, as measured in the pump well, is less than 61.2 ft MSL, the discharge from each plant service water (PSW) pump will be throttled such that each pump does not exceed 7000 gpm. 2. If the water level as measured in the pump well, decreases to less than 60.7 ft MSL, or if the level in the river* drops to a level equivalent to less	I. Minimum River Level The water level as measured in the pump well, and the level in the river* shall be verified with the following frequencies: 1. > 61.7 ft — Biweekly. 2. ≤ 61.7 ft — Every 12 hrs.

*Only pump well monitoring is required if a temporary weir is not in place.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.6.H.1. Relief/Safety Valves	4.6.H.1. Relief/Safety Valves
a. When [illegible] more relief/safety [illegible] known to be failed*** an [illegible] shutdown shall be initiated [illegible] reactor depressurized to [illegible] 113 psig within 24 hours. [illegible] reactor startup from a [illegible] condition all relief/safety valves shall be operable.**	a. End of Operating Cycle Approximately one-half of all relief/safety valves shall be benchchecked or replaced with a benchchecked valve each refueling outage. All 11 valves will have been checked or replaced upon the completion of every second operating cycle.
b. With one or more relief/safety valve(s) stuck open, place the reactor mode switch in the shutdown position.	b. Each Operating Cycle Once during each operating cycle, at a reactor pressure > 100 psig each relief valve shall be manually opened until thermocouples downstream of the valve indicate steam is flowing from the valve.
c. With one or more safety/relief valve tailpipe pressure switches of a safety/relief valve declared inoperable and the associated safety/relief valve(s) otherwise indicated to be open, place the reactor mode switch in the Shutdown position.	c. Integrity of Relief Valve Bellows* The integrity of the relief valve bellows shall be continuously monitored and the pressure switch calibrated once per operating cycle and the accumulators and air piping shall be inspected for leakage once per operating cycle.
d. With one safety/relief valve tailpipe pressure switch of a safety/relief valve declared inoperable and the associated safety/relief valve(s) otherwise indicated to be closed, plant operation may continue. Remove the function of that pressure switch from the low low set logic circuitry until the next COLD SHUTDOWN. Upon COLD SHUTDOWN, restore the pressure switch(es) to OPERABLE status before STARTUP.	d. Relief Valve Maintenance At least one relief valve shall be disassembled and inspected each operating cycle.
e. With both safety/relief valve tailpipe pressure switches of a safety/relief valve declared inoperable and the associated safety/relief valve(s) otherwise indicated to be closed, restore at least one inoperable switch to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.	e. Operability of Tailpipe Pressure Switches The tailpipe pressure switch of each relief/safety valve shall be demonstrated operable**** by performance of a: 1. Functional Test: a. At least once per 92 days, except that all portions of instrumentation inside the primary containment may be excluded from the functional test, and

*Does not apply to two-stage Target Rock SRVs

**The Relief/Safety valves are not required to be operable for performance of inservice hydrostatic or pressure testing with reactor pressure greater than 113 psig and all control rods inserted. Overpressure protection will be provided as required by ASME Code.

***The failure or malfunction of any safety/relief valve shall be reported by telephone within 24 hours; confirmed by telegraph, mailgram, or facsimile transmission to the Director of the Regional Office or his designee no later than the first working day following the event; and a written followup report within 30 days. The written followup report should be completed in accordance with 10 CFR 50.73 or other applicable requirements.

****One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

4.6.H.1. Relief/Safety Valves (Continued)

e. Operability of Tail Pipe Pressure Switches

1. Functional Test:

b. At each scheduled outage greater than 72 hours during which entry is made into the primary containment, if not performed within the previous 92 days.

2. Calibration and verifying the setpoint to be 85, +15, -5 psig at least once per 18 months.

3.6.H.2. Relief/Safety Valves Low Low Set Function

During power operation startup, and hot standby, the relief valve function and the low low set function of the following reactor coolant system safety/relief valves shall be OPERABLE with the following low low set function lift settings:

Low Low Set Valve Function	Allowable Value (psig)* Open	Close
Low	≤ 1005	≤ 857
Medium	≤ 1020	≤ 872
Medium High	≤ 1035	≤ 887
High	≤ 1045	≤ 897

a. With the relief valve function and/or the low low set function of one of the above required reactor coolant system safety/relief valves inoperable, restore the relief valve function and the low low set function to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and COLD SHUTDOWN within the following 24 hours.

4.6.H.2. Relief/Safety Valves Low Low Set Function

The low low set relief valve function and the low low set function pressure actuation instrumentation shall be demonstrated OPERABLE*** by performance of a:

a. CHANNEL FUNCTIONAL TEST, including calibration of the trip unit and the dedicated high steam dome pressure channels**, at least once per quarter.

b. CHANNEL CALIBRATION, Logic System Function Test, and simulated automatic operation of the entire system at least once per 18 months.

*The lift setting pressure shall correspond to ambient conditions of the valves at nominal operating temperatures and pressures.

**The setpoint for dedicated high steam dome pressure channels is ≤ 1054 psig.

***One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

4.9.A.6. Emergency 250 Volt DC to 600 Volt AC Inverters (Continued)

b. Once every scheduled refueling outage, the emergency 250 volt DC/600 volt AC inverters shall be subjected to a load test to demonstrate operational readiness.

3.9.A.7. Logic Systems

The following logic systems shall be operable:

a. The common accident signal logic system is operable.

b. The undervoltage relays and supporting system are operable.

c. The common accident signal logic system, and undervoltage relays and supporting system are operable.

4.9.A.7. Logic Systems

The logic systems shall be tested in the manner and frequency as follows:

a. Each division of the common accident signal logic system shall be tested every scheduled refueling outage to demonstrate that it will function on actuation of the core spray system to provide an automatic start signal to all 3 diesel generators.

b.1. Once every scheduled refueling outage, the conditions under which the undervoltage logic system is required shall be simulated with an undervoltage on each start bus to demonstrate that the diesel generators will start. The testing of the undervoltage logic shall demonstrate the operability of the 4160 volt load shedding and auto bus transfer circuits. The simulations shall test both the degraded voltage and the loss of off-site power relays.

2. Deleted

c.1. Once per operating cycle each diesel generator shall be demonstrated operable by simulating both a loss of off-site power and a degraded voltage condition in conjunction with an accident test signal and verifying:

INSTRUMENTATION

RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.14.1 The radioactive liquid effluent monitoring instrumentation channels shown in table 3.14.1-1 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.15.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined in accordance with the OFFSITE DOSE CALCULATION MANUAL (ODCM).

APPLICABILITY

As shown in table 3.14.1-1.

ACTION

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

b. With the number of channels OPERABLE* less than the minimum channels required by table 3.14.1-1, take the action shown in table 3.14.1-1.

c. The provisions of Specification 6.9.1.13(b) are not applicable.

d. When the ACTION statement or other requirements of this LCO cannot be met, steps need not be taken to change the Operational Mode of the Unit. Entry into an Operational Mode or other specified condition may be made if, as a minimum, the requirements of the ACTION statement are satisfied.

SURVEILLANCE REQUIREMENTS

4.14.1 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST operations at the frequencies shown in table 4.14.1-1.

*One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

TABLE 3.14.2-1 (SHEET 3 OF 4)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Table Notations

+Monitor must be capable of responding to a Lower Limit of Detection of 1×10^{-4} μCi/ml.

*During releases via this pathway.

**During main condenser offgas treatment system operation.

***During operation of the main condenser air ejector.

ACTION 104 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue, provided the flowrate is estimated at least once per 4 hours.

If the number of channels OPERABLE remains less than required by the Minimum Channels OPERABLE requirement for over 30 days, an explanation of the circumstances shall be included in the next semi-annual effluent release report.

One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

ACTION 105 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue, provided grab samples are taken daily and analyzed daily for gross activity within 24 hours. With the number of main stack monitoring system channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, without delay suspend drywell purge.

If the number of channels OPERABLE remains less than required by the Minimum Channels OPERABLE requirement for over 30 days, an explanation of the circumstances shall be included in the next semi-annual effluent release report.

One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

ACTION 106 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, operation of the main condenser offgas treatment system may continue provided:

(a) Gas samples are collected once per 4 hours and analyzed within the ensuing 4 hours, or

(b) Using a temporary hydrogen analyzer installed in the offgas system line downstream of the recombiner, hydrogen concentration readings are taken and logged every 4 hours.

TABLE 3.14.2-1 (SHEET 4 OF 4)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Table Notations (Continued)

If the number of channels OPERABLE remains less than required by the Minimum Channels OPERABLE requirement for over 30 days, an explanation of the circumstances shall be included in the next semi-annual effluent release report.

One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

ACTION 107 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue, provided samples are continuously collected with auxiliary sampling equipment for periods on the order of 7 days and analyzed within 48 hours after the end of the sampling period.

If the number of channels OPERABLE remains less than required by the Minimum Channels OPERABLE requirement for over 30 days, an explanation of the circumstances shall be included in the next semi-annual effluent release report.

One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

ACTION 108 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, release to the environment may continue for up to 72 hours provided:

a. The offgas system is not bypassed, and

b. The offgas post-treatment monitor (D11-K615) or the main stack monitor (D11-K600) is OPERABLE.

Otherwise, be in at least HOT STANDBY within 12 hours.

If the number of channels OPERABLE remains less than required by the Minimum Channels OPERABLE requirement for over 30 days, an explanation of the circumstances shall be included in the next semi-annual effluent release report.

One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable actions.

CONTROL ROD SCRAM ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.1.3.5 All control rod scram accumulators shall be OPERABLE.

APPLICABILITY: CONDITIONS 1, 2 and 5*.

ACTION:

a. In CONDITION 1 or 2 with one control rod scram accumulator inoperable, the provisions of Specification 3.0.4 are not applicable and operation may continue, provided that within 8 hours:

   1. The inoperable accumulator is restored to OPERABLE status, or

   2. The control rod associated with the inoperable accumulator is declared inoperable and the requirements of Specification 3.1.3.1 are satisfied.

   Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

b. In CONDITION 5* with a withdrawn control rod scram accumulator inoperable, fully insert the affected control rod and electrically disarm the directional control valves or close the withdraw isolation valve within one hour. The provisions of Specification 3.0.3 are not applicable.

c. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.1.3.5 The control rod scram accumulators shall be determined OPERABLE:

a. At least once per 7 days by verifying that the pressure and leak detectors are not in the alarmed condition, and

b. At least once per 18 months by performance of a:

   1. CHANNEL FUNCTIONAL TEST of the leak detectors, and

   2. CHANNEL CALIBRATION of the pressure detectors to alarm at $\geq$ 940 psig.

*At least the accumulator associated with each withdrawn control rod. Not applicable to control rods removed per Specification 3.9.11.1 or 3.9.11.2.

ROD BLOCK MONITOR

LIMITING CONDITION FOR OPERATION

3.1.4.3 Both Rod Block Monitor (RBM) channels shall be OPERABLE.

APPLICABILITY: CONDITION 1, when THERMAL POWER is greater than or equal to 30% of RATED THERMAL POWER and when the MCPR is less than the value provided in the CORE OPERATING LIMITS REPORT.

ACTION:

a. With one RBM channel inoperable, POWER OPERATION may continue provided that the inoperable RBM channel is restored to OPERABLE status within 24 hours; otherwise, trip at least one rod block monitor channel within the next hour.

b. With both RBM channels inoperable, trip at least one rod block monitor channel within one hour.

c. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.1.4.3 a. With both RBM channels OPERABLE, surveillance requirements are given in Specification 4.3.5.

b. With one RBM channel INOPERABLE, the other channel shall be demonstrated OPERABLE by performance of a CHANNEL FUNCTIONAL TEST prior to withdrawal of control rods.

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the reactor protection system instrumentation channels shown in Table 3.3.1-1 shall be OPERABLE with the REACTOR PROTECTION SYSTEM RESPONSE TIME as shown in Table 3.3.1-2. Set points and interlocks are given in Table 2.2.1-1.

APPLICABILITY: As shown in Table 3.3.1-1.

ACTION:

a. With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place at least one inoperable channel in the tripped condition within 12 hours.

b. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, place at least one inoperable channel in at least one trip system* in the tripped condition within 1 hour and take the ACTION required by Table 3.3.1-1.

c. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS, provided at least one OPERABLE channel in the same trip system is monitoring that parameter.

d. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.1.1 Each reactor protection system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.1-1.

4.3.1.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

4.3.1.3 The REACTOR PROTECTION SYSTEM RESPONSE TIME of each reactor trip function of Table 3.3.1-2 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.

*If both channels are inoperable in one trip system, select at least one inoperable channel in that trip system to place in the tripped condition, except when this could cause the Trip Function to occur.

ACTION 9 - In OPERATIONAL CONDITION 1 or 2, be in at least HOT SHUTDOWN within 6 hours.

In OPERATIONAL CONDITION 3 or 4, lock the reactor mode switch in the Shutdown position within 1 hour.

In OPERATIONAL CONDITION 5, suspend all operations involving CORE ALTERATIONS or positive reactivity changes and fully insert all insertable control rods within 1 hour.

TABLE NOTATIONS

a. Deleted.

b. The "shorting links" shall be removed from the RPS circuitry during CORE ALTERATIONS and shutdown margin demonstrations performed in accordance with Specification 3.10.3.

c. The IRM scrams are automatically bypassed when the reactor vessel mode switch is in the Run position and all APRM channels are OPERABLE and on scale.

d. An APRM channel is inoperable if there are less than 2 LPRM inputs per level or less than 11 LPRM inputs to an APRM channel.

e. These functions are not required to be OPERABLE when the reactor pressure vessel head is unbolted or removed.

f. This function is automatically bypassed when the reactor mode switch is in other than the Run position.

g. This function is not required to be OPERABLE when PRIMARY CONTAINMENT INTEGRITY is not required.

h. With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.11.1 or 3.9.11.2.

i. These functions are bypassed when turbine first stage pressure is $\leq$250* psig, equivalent to THERMAL POWER less than 30% of RATED THERMAL POWER.

j. Within 24 hours prior to the planned start of the hydrogen injection test 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 test. The background radiation level and associated trip setpoints may be adjusted during the test based on either calculations or measurements of actual radiation levels resulting from hydrogen

*Initial setpoint. Final setpoint to be determined during startup testing.

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 establishing reactor power levels below 20% rated power.

INSTRUMENTATION

3/4.3.2 ISOLATION ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The isolation actuation instrumentation channels shown in Table 3.3.2-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.2-2 and with ISOLATION SYSTEM RESPONSE TIME as shown in Table 3.3.2-3.

APPLICABILITY: As shown in Table 3.3.2-1.

ACTION:

a. With an isolation actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.2-2, declare the channel inoperable and place the inoperable channel in the tripped condition* until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

b. With the number of OPERABLE channels less than required by the minimum OPERABLE channels per trip system requirement for one trip system, either:

   1. Place the inoperable channel(s) in the tripped condition* within 12 hours

      OR

   2. Take the ACTION required by Table 3.3.2-1.

   The provisions of Specification 3.0.4 are not applicable.

c. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, place at least one inoperable channel in at least one trip system** in the tripped condition within one hour and take the ACTION required by Table 3.3.2-1.

---

* With a design providing only one channel per trip system, an inoperable channel need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, the inoperable channel shall be restored to OPERABLE status within 2 hours or the ACTION required by Table 3.3.2-1 for that Trip Function shall be taken.

**If both channels are inoperable in one trip system, select at least one inoperable channel in that trip system to place in the tripped condition, except when that would cause the Trip Function to occur.

LIMITING CONDITION FOR OPERATION

d. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

e. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.2.1 Each isolation actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST AND CHANNEL CALIBRATION operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.2-1.

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

ACTION

ACTION 20 - Be in at least HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within the next 30 hours.

ACTION 21 - Be in at least STARTUP with the main steam line isolation valves closed within 2 hours or be in at least HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within the next 30 hours.

ACTION 22 - Be in at least STARTUP within 2 hours.

ACTION 23 - Be in at least STARTUP with the Group 1 isolation valves closed within 2 hours or in at least HOT SHUTDOWN within 6 hours.

ACTION 24 - Establish SECONDARY CONTAINMENT INTEGRITY with the standby gas treatment system operating within one hour.

ACTION 25 - Isolate the reactor water cleanup system.

ACTION 26 - Close the affected system isolation valves and declare the affected system inoperable.

ACTION 27 - Verify power availability to the bus at least once per 12 hours or close the affected system isolation valves and declare the affected system inoperable.

ACTION 28 - Close the shutdown cooling supply and reactor vessel head spray isolation valves unless reactor steam dome pressure $\leq$ 145 psig.

ACTION 29 - Either close the affected isolation valves within 24 hours or be in HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the next 30 hours.

NOTES

* Actuates the standby gas treatment system.

** When handling irradiated fuel in the secondary containment.

*** When performing inservice hydrostatic or leak testing with the reactor coolant temperature above 212° F.

a. See Specification 3.6.3, Table 3.6.3-1 for valves in each valve group.

b. Deleted.

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

c. With a design providing only one channel per trip system, an inoperable channel need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, the inoperable channel shall be restored to OPERABLE status within 2 hours or the ACTION required by Table 3.3.2-1 for that Trip Function shall be taken.

d. Trips the mechanical vacuum pumps.

e. A channel is OPERABLE if 2 of 4 instruments in that channel are OPERABLE.

f. May be bypassed with all turbine stop valves closed.

g. Closes only RWCU outlet isolation valve 2G31-F004.

h. Alarm only.

i. Adjustable up to 60 minutes.

j. Isolates containment purge and vent valves.

k. Within 24 hours prior to the planned start of the hydrogen injection test 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 test. The background radiation level and associated trip setpoints may be adjusted during the test 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 establishing reactor power levels below 20% rated power.

TABLE 4.3.2.1

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
1. PRIMARY CONTAINMENT ISOLATION					
a. Reactor Vessel Water Level					
1. Low (Level 3)	S	Q	R	1, 2, 3	
2. Low Low (Level 2)	S	Q	R	1, 2, 3	
3. Low Low Low (Level 1)	S	Q	R	1, 2, 3	
b. Drywell Pressure - High	S	Q	R	1, 2, 3	
c. Main Steam Line					
1. Radiation - High	S	W[a]	R	1, 2, 3	
2. Pressure - Low	NA	NA	Q	1	
3. Flow - High	S	Q	R	1, 2, 3	
d. Main Steam Line Tunnel Temperature - High	S	Q	R	1, 2, 3	
e. Condenser Vacuum - Low	NA	NA	Q	1, 2#, 3#	
f. Turbine Building Area Temp. - High	NA	Q	R	1, 2, 3	
g. Drywell Radiation - High	S	Q	R	1, 2, 3	
2. SECONDARY CONTAINMENT ISOLATION					
a. Reactor Building Exhaust Radiation - High	S	Q[a]	R	1, 2, 3, 5 and *	
b. Drywell Pressure - High	S	Q	R	1, 2, 3	
c. Reactor Vessel Water Level - Low Low (Level 2)	S	Q	R	1, 2, 3	
d. Refueling Floor Exhaust Radiation - High	S	NA	Q	1, 2, 3, 5 and *	

*When handling irradiated fuel in the secondary containment.
#May be bypassed with all turbine stop valves closed.
(a)Instrument alignment using a standard current source.

TABLE 4.3.2.1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
3. REACTOR WATER CLEANUP SYSTEM ISOLATION					
a. Δ Flow - High	S	Q	R	1, 2, 3	
b. Area Temperature - High	S	Q	R	1, 2, 3	
c. Area Ventilation Δ Temperature - High	S	Q	R	1, 2, 3	
d. SLCS Initiation	NA	R	NA	1, 2, 3	
e. Reactor Vessel Water Level - Low Low (Level 2)	S	Q	R	1, 2, 3	
4. HIGH PRESSURE COOLANT INJECTION SYSTEM ISOLATION					
a. HPCI Steam Line Flow-High	S	Q	R	1, 2, 3	
b. HPCI Steam Supply Pressure-Low	S	Q	R	1, 2, 3	
c. HPCI Turbine Exhaust Diaphragm Pressure - High	S	Q	R	1, 2, 3	
d. HPCI Pipe Penetration Room Temperature - High	S	Q	R	1, 2, 3	
e. Suppression Pool Area Ambient Temp. - High	S	Q	R	1, 2, 3	
f. Suppression Pool Area ΔT - High	S	Q	R	1, 2, 3	
g. Suppression Pool Area Temp. Timer Relays	NA	SA	R	1, 2, 3	
h. Emergency Area Cooler Temp. - High	S	Q	R	1, 2, 3	
i. Drywell Pressure - High	S	Q	R	1, 2, 3	
j. Logic Power Monitor	NA	R	NA	1, 2, 3	

TABLE 4.3.2.1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
5. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION					
a. RCIC Steam Line Flow-High	S	Q	R	1, 2, 3	
b. RCIC Steam Supply Pressure-Low	S	Q	R	1, 2, 3	
c. RCIC Turbine Exhaust Diaphragm Pressure-High	S	Q	R	1, 2, 3	
d. Emergency Area Cooler Temperature - High	S	Q	R	1, 2, 3	
e. Suppression Pool Area Ambient Temperature-High	S	Q	R	1, 2, 3	
f. Suppression Pool Area ΔT-High	S	Q	R	1, 2, 3	
g. Suppression Pool Area Temp. Timer Relays	NA	SA	R	1, 2, 3	
h. Drywell Pressure - High	S	Q	R	1, 2, 3	
i. Logic Power Monitor	NA	R	NA	1, 2, 3	
6. SHUTDOWN COOLING SYSTEM ISOLATION					
a. Reactor Vessel Water Level - Low (Level 3)	S	Q	R	3, 4, 5	
b. Reactor Steam Dome Pressure - High	S	Q	R	1, 2, 3	

3/4.3.3 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3 The emergency core cooling system (ECCS) actuation instrumentation shown in Table 3.3.3-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.3-2 and with EMERGENCY CORE COOLING SYSTEM RESPONSE TIME as shown in Table 3.3.3-3.

APPLICABILITY: As shown in Table 3.3.3-1.

ACTION:

a. With an ECCS actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.3-2, declare the channel inoperable and place the inoperable channel in the tripped condition until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

b. With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place the inoperable channel in the tripped condition or declare the associated ECCS inoperable within 12 hours.

c. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, declare the associated ECCS inoperable within one hour.

d. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

e. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.3.1 Each ECCS actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.3-1.

4.3.3.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

TABLE 4.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. CORE SPRAY SYSTEM				
a. Reactor Vessel Water Level - Low Low Low (Level 1)	S	Q	R	1, 2, 3, 4, 5
b. Drywell Pressure - High	S	Q	R	1, 2, 3
c. Reactor Steam Dome Pressure - Low	S	Q	R	1, , 3, 4, 5
d. Logic Power Monitor	NA	R	NA	1, , 3, 4, 5
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM				
a. Drywell Pressure - High	S	Q	R	1, 2, 3
b. Reactor Vessel Water Level - Low Low Low (Level 1)	S	Q	R	1, 2, 3, 4*, 5*
c. Reactor Vessel Shroud Level (Level 0)	S	Q	R	1, 2, 3, 4*, 5*
d. Reactor Steam Dome Pressure - Low	S	Q	R	1, 2, 3, 4*, 5*
e. Reactor Steam Dome Pressure - Low	S	Q	R	1, 2, 3, 4*, 5*
f. RHR Pump Start-Time Delay Relay	NA	NA	R	1, 2, 3, 4*, 5*
g. Logic Power Monitor	NA	R	NA	1, 2, 3, 4*, 5*

*Not applicable when two core spray subsystems are OPERABLE per Specification 3.5.3.1.

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED#	
3. HIGH PRESSURE COOLANT INJECTION SYSTEM					
a. Reactor Vessel Water Level - Low Low (Level 2)	S	Q	R	1, 2, 3	
b. Drywell Pressure-High	S	Q	R	1, 2, 3	
c. Condensate Storage Tank Level - Low	NA	NA	Q	1, 2, 3	
d. Suppression Chamber Water Level - High	S	Q	R	1, 2, 3	
e. Logic Power Monitor	NA	R	NA	1, 2, 3	
f. Reactor Vessel Water Level-High (Level 8)	S	Q	R	1, 2, 3	
4. AUTOMATIC DEPRESSURIZATION SYSTEM					
a. Drywell Pressure-High	S	Q	R	1, 2, 3	
b. Reactor Vessel Water Level - Low Low Low (Level 1)	S	Q	R	1, 2, 3	
c. ADS Timer	NA	NA	R	1, 2, 3	
d. ADS Low Water Level Actuation Timer	NA	NA	R	1, 2, 3	
e. Reactor Vessel Water Level - Low (Level 3)	S	Q	R	1, 2, 3	
f. Core Spray Pump Discharge Pressure - High	S	Q	R	1, 2, 3	
g. RHR (LPCI MODE) Pump Discharge Pressure - High	S	Q	R	1, 2, 3	
h. Control Power Monitor	NA	R	NA	1, 2, 3	
5. LOW LOW SET S/RV SYSTEM					
a. Reactor Steam Dome Pressure - High	S	M	R	1, 2, 3	

HPCI and ADS are not required to be OPERABLE with reactor steam dome pressure $\leq$ 150 psig.

3/4.3.4 REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.4 The reactor core isolation cooling (RCIC) system actuation instrumentation shown in Table 3.3.4-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.4-2.

APPLICABILITY: CONDITIONS 1, 2 and 3 with reactor steam dome pressure > 150 psig.

ACTION:

a. With a RCIC system actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.4-2, declare the channel inoperable and place the inoperable channel in the tripped condition until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

b. With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place the inoperable channel in the tripped condition or declare the RCIC system inoperable within 12 hours.

c. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, declare the RCIC system inoperable within one hour.

d. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.3.4.1 Each RCIC system actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION at the frequencies shown in Table 4.3.4-1.

4.3.4.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

TABLE 3.3.4-1

REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

FUNCTIONAL UNITS	MINIMUM NUMBER OF OPERABLE CHANNELS PER TRIP SYSTEM
a. Reactor Vessel Water Level - Low Low (Level 2) (2B21-N692 A, B, C, D)	2
b. Condensate Storage Tank Water Level - Low (2E51-N060, 2E51-N061)	2(a)
c. Suppression Pool Water Level-High (2E51-N062A, B)	2(a)

(a) Provides Signal to RCIC Pump Suction Valves Only.

TABLE 4.3.4-1

REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNITS	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	
a. Reactor Vessel Water Level-Low Low (Level 2)	S	Q	R	I
b. Condensate Storage Tank Level- Low	NA	NA	Q	I
c. Suppression Pool Water Level- High	NA	NA	Q	I

3/4.3.5 CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.5 The control rod withdrawal block instrumentation shown in Table 3.3.5-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.5-2.

APPLICABILITY: As shown in Table 3.3.5-1.

ACTION:

a. With a control rod withdrawal block instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.5-2, declare the channel inoperable until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

b. With the requirements for the minimum number of OPERABLE channels not satisfied for any trip function, place that trip function in the tripped condition within one hour.

c. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

d. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.5 Each of the above required control rod withdrawal block instrumentation channels shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.5-1.

TABLE 3.3.5-1

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

TRIP FUNCTION	MINIMUM NUMBER OF OPERABLE CHANNELS PER TRIP FUNCTION	APPLICABLE OPERATIONAL CONDITIONS
1. APRM (2C51-K605 A, B, C, D, E, F)		
a. Flow Referenced Simulated Thermal Power - Upscale	4	1
b. Inoperative	4	1, 2, 5
c. Downscale	4	1
d. Neutron Flux - High, 12%	4	2, 5
2. ROD BLOCK MONITOR (2C51-K605 RBM A and B)		
a. Upscale	1	1[e]
b. Inoperative	1	1[e]
c. Downscale	1	1[e]
3. SOURCE RANGE MONITORS (2C51-K600 A, B, C, D)		
a. Detector not full in[b]	3	2
	2	5
b. Upscale[c]	3	2
	2	5
c. Inoperative[c]	3	2
	2	5
d. Downscale[b]	3	2
	2	5
4. INTERMEDIATE RANGE MONITORS[d] (2C51-K601 A, B, C, D, E, F, G, H)		
a. Detector not full in[e]	6	2, 5
b. Upscale	6	2, 5
c. Inoperative	6	2, 5
d. Downscale[e]	6	2
5. SCRAM DISCHARGE VOLUME (2C11-N013E)		
a. Water Level-High	1[g]	1, 2, 5[f]

TABLE 3.3.5-1 (Continued)

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

NOTE

a. When the limiting condition defined in section 3.1.4.3 exists.

b. This function is bypassed if detector is reading > 100 cps or the IRM channels are on range 3 or higher.

c. This function is bypassed when the associated IRM channels are on range 8 or higher.

d. A total of 6 IRM instruments must be OPERABLE.

e. This function is bypassed when the IRM channels are on range 1.

f. With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.11.1 or 3.9.11.2.

g. Withdrawal of control rods is not permitted during required surveillance testing.

TABLE 4.3.5-1

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION[a]	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. APRM:				
a. Flow Referenced Simulated Thermal Power-Upscale	NA	S/U[b],Q	R	1
b. Inoperative	NA	S/U[b],Q	NA	1, 2, 5
c. Downscale	NA	S/U[b],Q	R	1
d. Neutron Flux - High, 12%	NA	S/U[b],Q	R	2, 5
2. Rod Block Monitor:				
a. Upscale	NA	S/U[b], Q	R	1[d]
b. Inoperative	NA	S/U[b], Q	NA	1[d]
c. Downscale	NA	S/U[b], Q	R	1[d]
3. Source Range Monitors:				
a. Detector not full in	NA	S/U[b],W	NA	2, 5
b. Upscale	NA	S/U[b],W	R	2, 5
c. Inoperative	NA	S/U[b],W	NA	2, 5
d. Downscale	NA	S/U[b],W	R	2, 5
4. Intermediate Range Monitors:				
a. Detector not full in	NA	S/U[b],W[c]	NA	2, 5
b. Upscale	NA	S/U[b],W[c]	R	2, 5
c. Inoperative	NA	S/U[b],W[c]	NA	2, 5
d. Downscale	NA	S/U[b],W[c]	R	2, 5
5. Scram Discharge Volume:				
a. Water Level-High	NA	Q	R	1, 2, 5[e]

INSTRUMENTATION

3/4.3.6 MONITORING INSTRUMENTATION

RADIATION MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.1 The radiation monitoring instrumentation channels shown in Table 3.3.6.1-1 shall be OPERABLE with their alarm/trip setpoints within the specified limits.

APPLICABILITY: As shown in Table 3.3.6.1-1.

ACTION:

a. With a radiation monitoring instrumentation channel alarm/trip setpoint exceeding the value shown in Table 3.3.6.1-1, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.

b. With one or more of the above required radiation monitoring instrumentation channels inoperable, take the ACTION required by Table 3.3.6.1-1.

c. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

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

SURVEILLANCE REQUIREMENTS

4.3.6.1 Each of the above required radiation monitoring instrumentation channels shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.6.1-1.

INSTRUMENTATION

SEISMIC MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.2 The seismic monitoring instrumentation shown in Table 3.3.6.2-1 shall be OPERABLE.

APPLICABILITY: At all times.

ACTION:

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

b. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

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

SURVEILLANCE REQUIREMENTS

4.3.6.2.1 Each of the above required seismic monitoring instruments shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3.6.2-1.

4.3.6.2.2 Each of the above required seismic monitoring instruments actuated during a seismic event shall be restored to OPERABLE status within 24 hours and a CHANNEL CALIBRATION performed within 30 days following the seismic event. Data shall be retrieved from actuated instruments and analyzed to determine the magnitude of the vibratory ground motion. A Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 10 days describing the magnitude, frequency spectrum and resultant effect upon facility features important to safety.

INSTRUMENTATION

REMOTE SHUTDOWN MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.3 The remote shutdown monitoring instrumentation channels shown in Table 3.3.6.3-1 shall be OPERABLE with readouts displayed external to the control room.

APPLICABILITY: CONDITIONS 1, 2 and 3.

ACTION:

a. With one or more of the above required remote shutdown monitoring instrumentation channels inoperable, either restore the inoperable channel(s) to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.6.3 Each of the above required remote shutdown monitoring instrumentation channels shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3.6.3-1.

INSTRUMENTATION

POST-ACCIDENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.4 The post-accident monitoring instrumentation channels shown in Table 3.3.6.4-1 shall be OPERABLE.

APPLICABILITY: CONDITIONS 1, 2, and 3*.

ACTION:

a. With one or more of the above required post-accident monitoring channels inoperable, either restore the inoperable channel(s) to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours.

b. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.6.4 Each of the above required post-accident monitoring instrumentation channels shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3.6.4-1.

*Condition 3 is applicable only to Items 12, 13, and 14 of Table 3.3.6.4-1.

TABLE 3.3.6.4-1

POST-ACCIDENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE
1. Reactor Vessel Pressure (2B21-R623 A, B)	2
2. Reactor Vessel Shroud Water Level (2B21-R610, 2B21-R615)	2
3. Suppression Chamber Water Level (2T48-R622 A, B)	2
4. Suppression Chamber Water Temperature (2T47-R626, 2T47-R627)	2
5. Suppression Chamber Pressure (2T48-R608, 2T48-R609)	2
6. Drywell Pressure (2T48-R608, 2T48-R609)	2
7. Drywell Temperature (2T47-R626, 2T47-R627)	2
8. Post-LOCA Gamma Radiation (2D11-K622 A, B, C, D)	2
9. Drywell H_2-O_2 Analyzer (2P33-R601 A, B)	2*
10.a) Safety/Relief Valve Position Primary Indicator (2B21-N301 A-H and K-M)	(a)
b) Safety/Relief Valve Position Secondary Indicator (2B21-N004 A-H and K-M)	(a)
11. Drywell High Range Pressure (2T48-R601 A, B)	2
12. Drywell High Range Radiation (2D11-K621 A, B, 2T48-R601A, B)	2(b)
13. Main Stack Post-Accident Effluent Monitor (D11-R631)	1 (b)(c)
14. Reactor Building Vent Plenum Post-Accident Effluent Monitor (2D11-R631)	1 (b)(c)

*The Drywell H_2-O_2 Analyzers shall be operable with continuous sampling capability within 30 minutes of an ECCS actuation during a LOCA.

INSTRUMENTATION

SOURCE RANGE MONITORS

LIMITING CONDITION FOR OPERATION

3.3.6.5 Three source range monitors shall be OPERABLE.

APPLICABILITY: CONDITIONS 2*, 3 and 4.

ACTION:

a. In CONDITION 2* with one of the above required source range monitors inoperable, restore 3 source range monitors to OPERABLE status within 4 hours or be in at least HOT SHUTDOWN within the next 6 hours.

b. In CONDITION 3 or 4, with two or more of the above required source range monitors inoperable, verify all control rods to be fully inserted in the core and lock the reactor mode switch in the Shutdown position within one hour.

c. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.3.6.5 Each of the above required source range monitors shall be demonstrated OPERABLE by:

a. Performance of a:

1. CHANNEL CHECK at least once per:

(a) 12 hours in CONDITION 2*, and
(b) 24 hours in CONDITION 3 or 4.

2. CHANNEL CALIBRATION** at least once per 18 months.

b. Performance of a CHANNEL FUNCTIONAL TEST:

1. Within 24 hours prior to moving the reactor mode switch from the Shutdown position if not performed within the previous 7 days, and

2. At least once per 31 days.

*With IRMs on range 2 or below.

**May exclude neutron detectors.

LIMITING CONDITION FOR OPERATION (Continued)

c. Verifying, prior to withdrawal of control rods, that the SRM count rate is at least 3 cps with the detector fully inserted.

INSTRUMENTATION

MAIN CONTROL ROOM ENVIRONMENTAL CONTROL SYSTEM (MCRECS) ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.7 The MCRECS actuation instrumentation channels shown in Table 3.3.6.7-1 shall be OPERABLE, with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.6.7-2.

APPLICABILITY: As shown in Table 3.3.6.7-1.

ACTION:

a. As shown in Table 3.3.6.7-1.

b. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.3.6.7 Each MCRECS actuation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION operations during the OPERATIONAL CONDITION and at the frequencies shown in Table 4.3.6.7-1.

TABLE 3.3.6.7-1 (SHEET 2 OF 2)

MCRECS ACTUATION INSTRUMENTATION

ACTION

ACTION 52 - Take the ACTION required by Specification 3.3.3.

ACTION 53 - Take the ACTION required by Specification 3.3.2.

ACTION 54 -

a. With one of the required radiation monitors inoperable, restore the monitor to OPERABLE status within 7 days or, within the next 6 hours, initiate and maintain operation of the MCRECS in the pressurization mode of operation.

b. With no radiation monitors OPERABLE, within 1 hour initiate and maintain operation of the MCRECS in the pressurization mode of operation.

c. The provisions of Specification 3.0.4 are not applicable.

NOTES

* When handling irradiated fuel in secondary containment.

a. (Deleted)

b. With a design providing only one channel per trip system, an inoperable channel need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, the inoperable channel shall be restored to OPERABLE status within 12 hours or the ACTION required by Table 3.3.6.7-1 for that Trip Function shall be taken.

c. Actuates the MCRECS in the control room pressurization mode.

d. (Deleted)

e. Within 24 hours prior to the planned start of the hydrogen injection test with the reactor power at greater than 20-percent 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 test. The background radiation level and associated trip setpoints may be adjusted during the test 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 establishing reactor power levels below 20-percent rated power.

TABLE 4.3.6.7-1

MCRECS ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
1. Reactor Vessel Water Level - Low Low Low (Level 1)	S	Q	R	1, 2, 3	—
2. Drywell Pressure - High	S	Q	R	1, 2, 3	—
3. Main Steam Line Radiation - High	S	W[a]	R	1, 2, 3	—
4. Main Steam Line Flow - High	S	Q	R	1, 2, 3	—
5. Refueling Floor Area Radiation - High	S	Q[a]	Q	1, 2, 3, 5 *	—
6. Control Room Air Inlet Radiation - High	NA	Q[a]	R	1, 2, 3, 5, *	—

* When handling irradiated fuel in the secondary containment.

a. Instrument alignment using a standard current source.

INSTRUMENTATION

RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.9 The radioactive liquid effluent monitoring instrumentation channels shown in table 3.3.6.9-1 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.1.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined in accordance with the OFFSITE DOSE CALCULATION MANUAL (ODCM).

APPLICABILITY

As shown in table 3.3.6.9-1.

ACTION

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

b. With the number of channels OPERABLE less than the minimum channels required by table 3.3.6.9-1, take the ACTION shown in table 3.3.6.9-1.

c. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

d. The provisions of Specifications 3.0.3, 3.0.4, and 6.9.1.13(b) are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.6.9 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST operations at the frequencies shown in table 4.3.6.9-1.

INSTRUMENTATION

RADIOACTIVE GASEOUS EFFLUENT INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.10 The radioactive gaseous effluent monitoring instrumentation channels shown in table 3.3.6.10-1 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.2.1(a) are not exceeded. The alarm/trip setpoints of these channels shall be determined in accordance with the ODCM.

APPLICABILITY:

As shown in table 3.3.6.10-1.

ACTION

a. With a radioactive gaseous effluent monitoring instrumentation channel alarm/trip setpoint less conservative than a value that will ensure that the limits of 3.11.2.1(a) are met, without delay restore the setpoint to a value that will ensure that the limits of Specification 3.11.2.1(a) are met or declare the channel inoperable.

b. With the number of channels OPERABLE less than the minimum channels required by table 3.3.6.10-1, take the ACTION shown in table 3.3.6.10-1.

c. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

d. The provisions of Specifications 3.0.3, 3.0.4, and 6.9.1.13(b) are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.6.10 Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST operations at the frequencies shown in table 4.3.6.10-1.

3/4.3.8 DEGRADED STATION VOLTAGE PROTECTION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.8 The degraded station voltage relay channels shown in Table 3.3.8-1 shall be OPERABLE.

APPLICABILITY: CONDITIONS 1, 2, and 3.

ACTION:

a. With the number of OPERABLE channels one less than the required OPERABLE channels, operation may proceed until performance of the next scheduled instrument functional test provided a trip signal is placed in the LOSP lock-out relay logic for the applicable inoperable channel.

b. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.3.8 Each of the above required degraded station voltage relay channels shall be demonstrated OPERABLE by performance of the CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operation at the frequencies shown in Table 4.3.8-1.

INSTRUMENTATION

3/4.3.9 RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITIO', FOR OPERATION

3.3.9.1 The anticipated transient without scram recirculation pump trip (ATWS-RPT) system instrumentation channels shown in Table 3.3.9.1-1 shall be OPERABLE with their trip setpoints set consistent with values shown in the Trip Setpoint column of Table 3.3.9.1-2.

APPLICABILITY: OPERATIONAL CONDITION 1.

ACTION:

a. With an ATWS recirculation pump trip system instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.9.1-2, declare the channel inoperable until the channel is restored to OPERABLE status with the channel trip setpoint adjusted consistent with the Trip Setpoint value.

b. With the number of OPERABLE channels one less than required by the Minimum OPERABLE Channels per Trip System requirement for one or both trip systems, place the inoperable channel in the tripped condition within 12 hours.

c. With the number of OPERABLE channels two less than required by the Minimum OPERABLE Channels per Trip System requirement for one trip system and,

   1. If the inoperable channels consist of one reactor vessel water level channel and one reactor vessel pressure channel, place both inoperable channels in the tripped condition within 12 hours.

   2. If the inoperable channels include two reactor vessel water level channels or two reactor vessel pressure channels, declare the trip system inoperable.

d. With one trip system inoperable, restore the inoperable trip system to OPERABLE status within 14 days or be in at least STARTUP within the next 6 hours.

e. With both trip systems inoperable, restore at least one trip system to OPERABLE status within 1 hour or be in at least STARTUP within the next 6 hours.

f. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

4.3.9.1.1 Each ATWS recirculation pump trip system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3.9.1-1.

4.3.9.1.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months.

INSTRUMENTATION

END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.9.2 The end-of-cycle recirculation pump trip (EOC-RPT) system instrumentation channels shown in Table 3.3.9.2-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.9.2-2 and with the END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM RESPONSE TIME as shown in Table 3.3.9.2-3.

APPLICABILITY: OPERATIONAL CONDITION 1, when THERMAL POWER is greater than or equal to 30% of RATED THERMAL POWER.

ACTION:

a. With an end-of-cycle recirculation pump trip system instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.9.2-2, declare the channel inoperable until the channel is restored to OPERABLE status with the channel setpoint adjusted consistent with the Trip Setpoint value.

b. With the number of OPERABLE channels one less than required by the Minimum OPERABLE Channels per Trip System requirement for one or both trip systems, place the inoperable channel(s) in the tripped condition within 12 hours.

c. With the number of OPERABLE channels two or more less than required by the Minimum OPERABLE Channels per Trip System requirement for one trip system and:

   1. If the inoperable channels consist of one turbine control valve channel and one turbine stop valve channel, place both inoperable channels in the tripped condition within 12 hours.

   2. If the inoperable channels include two turbine control valve channels or two turbine stop valve channels, declare the trip system inoperable.

d. With one trip system inoperable, restore the inoperable trip system to OPERABLE status within 72 hours or reduce THERMAL POWER to less than 30% of RATED THERMAL POWER within the next 6 hours.

e. With both trip systems inoperable, restore at least one trip system to OPERABLE status within one hour or reduce THERMAL POWER to less than 30% of RATED THERMAL POWER within the next 6 hours.

f. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

TABLE 3.3.9.2-1

END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

TRIP FUNCTION	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM
1. Turbine Stop Valve - Closure	2[b]
2. Turbine Control Valve - Fast Closure	2[b]

[a] Deleted.

[b] This function shall be automatically bypassed when turbine first stage pressure is less than or equal to 250 psig, equivalent to THERMAL POWER less than 30% of RATED THERMAL POWER.

TABLE 4.3.9.2.1-1

END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	
1. Turbine Stop Valve - Closure	Q*	R	I
2. Turbine Control Valve - Fast Closure	Q*	R	I

*The Recirculation Pump Breakers need not be tripped on part of the Channel Functional Test. All channel alarm functions and only that portion of the trip functions which can be tested without causing a trip of the Breakers (and Recirculation Pumps) need be tested during the Channel Functional Test.

REACTOR COOLANT SYSTEM

3/4.4.2 SAFETY/RELIEF VALVES

LIMITING CONDITION FOR OPERATION

3.4.2.1 The safety valve function of the following reactor coolant system safety/relief valves shall be OPERABLE with the mechanical lift settings within ± 1% of the indicated pressures*.

4 Safety-relief valves @ 1090 psig.
4 Safety-relief valves @ 1100 psig**.
3 Safety-relief valves @ 1110 psig**.

APPLICABILITY: CONDITIONS 1, 2 and 3.

ACTION:

a. For low-low set valves, take the action required by Specification 3.4.2.2. For ADS valves, take the action required by Specification 3.5.2.
b. With one or more safety/relief valves stuck open, place the reactor mode switch in the Shutdown position.
c. With one or more S/RV tailpipe pressure switches of an S/RV declared inoperable and the associated S/RV(s) otherwise indicated to be open, place the reactor mode switch in the shutdown position.
d. With one S/RV tailpipe pressure switch of an S/RV declared inoperable and the associated S/RV(s) otherwise indicated to be closed, plant operation may continue. Remove the function of that pressure switch from the low low set logic circuitry until the next COLD SHUTDOWN. Upon COLD SHUTDOWN, restore the pressure switch(s) to OPERABLE status before STARTUP.
e. With both S/RV tailpipe pressure switches of an S/RV declared inoperable and the associated S/RV(s) otherwise indicated to be closed, restore at least one inoperable switch to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
f. The failure or malfunction of any safety/relief valve shall be reported by telephone within 24 hours; confirmed by telegraph, mailgram, or facsimile transmission to the Director of the Regional Office, or his designee no later than the first working day following the event; and a written followup report within 30 days. The written followup report should be completed in accordance with 10 CFR 50.73 or other applicable requirements.

g. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.4.2.1 The tail-pipe pressure switches of each safety/relief valve shall be demonstrated OPERABLE by performance of:

a. CHANNEL FUNCTIONAL TEST:
   1. At least once per quarter, except that all portions of the channel inside the primary containment may be excluded from the CHANNEL FUNCTIONAL TEST, and
   2. At each scheduled outage of greater than 72 hours during which entry is made into the primary containment, if not performed within the previous quarter.
b. CHANNEL CALIBRATION and verifying the setpoint to be 85 psig, with an allowable tolerance of +15 psig and -5 psig, at least once per 18 months.

* The lift setting pressure shall correspond to ambient conditions of the valves at nominal operating temperature and pressure.
** Up to two inoperable valves may be replaced with spare OPERABLE valves with lower setpoints of 1090 and 1100 psig, respectively, until the next refueling outage.

REACTOR COOLANT SYSTEM

SAFETY/RELIEF VALVES LOW-LOW SET FUNCTION

LIMITING CONDITION FOR OPERATION

3.4.2.2 The relief valve function and the low-low set function of the following reactor coolant system safety/relief valves shall be OPERABLE with the following low-low set function lift settings:

Low Low Set Valve Function	Allowable Value (psig)* Open	Close
Low	≤ 1010	≤ 860
Medium Low	≤ 1025	≤ 875
Medium High	≤ 1040	≤ 890
High	≤ 1050	≤ 900

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 3

ACTION:

a. With the relief valve function and/or the low-low set function of one of the above required reactor coolant system safety/relief valves inoperable, restore the inoperable relief valve function and low-low set function to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. With the relief valve function and/or the low-low set function of more than one of the above required reactor coolant system safety/relief valves inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

c. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.4.2.2 The low-low set relief valve function and the low-low set function pressure actuation instrumentation shall be demonstrated OPERABLE by performance of a:

a. CHANNEL FUNCTIONAL TEST, including calibration of the trip unit and the dedicated high steam dome pressure channels**, at least once per quarter.

b. CHANNEL CALIBRATION, LOGIC SYSTEM FUNCTIONAL TEST and simulated automatic operation of the entire system at least once per refueling outage.

*The lift setting pressure of the valves is defined in subsection 3/4 3.4.2.1. The accuracy of the low-low set setpoints is defined to be the accuracy of the instrumentation controlling the setpoints of the low-low set valves.
**The setpoint for dedicated high steam dome pressure channels is less than or equal to 1054 psig.

3/4.4.3 REACTOR COOLANT SYSTEM LEAKAGE

LEAKAGE DETECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

3.4.3.1 The following reactor coolant system leakage detection systems shall be OPERABLE:

a. The primary containment atmosphere particulate radioactivity monitoring system,

b. The primary containment floor drain and equipment sump level and flow monitoring systems, and

c. The primary containment gaseous radioactivity monitoring system.

APPLICABILITY: CONDITIONS 1, 2 and 3.

ACTION:

a. With either the primary containment atmosphere particulate radioactivity monitoring system or the primary containment gaseous radioactivity monitoring system inoperable, operation may continue for 30 days provided grab samples of the containment atmosphere are obtained and analyzed at least once per 8 hours;

b. With at least one leakage monitoring instrument OPERABLE for both the primary containment floor drain sump and the equipment sump, operation may continue for 30 days;

c. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

d. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.4.3.1 The leakage detection systems shall be demonstrated OPERABLE by:

a. Primary containment atmosphere gaseous and particulate monitoring system-performance of a CHANNEL CHECK at least once per 8 hours, a CHANNEL FUNCTIONAL TEST at least once per 31 days and a CHANNEL CALIBRATION at least once per 18 months.

b. Primary containment sump level and flow monitoring system-performance of a sensor check at least once per 8 hours, CHANNEL FUNCTIONAL TEST at least once per 31 days and a CHANNEL CALIBRATION at least once per 18 months.

EMERGENCY CORE COOLING SYSTEMS

3/4.5.3 LOW PRESSURE CORE COOLING SYSTEMS

CORE SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.5.3.1 Two independent Core Spray System (CSS) subsystems shall be OPERABLE with each subsystem comprised of:

a. One OPERABLE CSS pump, and

b. An OPERABLE flow path capable of taking suction from at least one of the following OPERABLE sources and transferring the water through the spray sparger to the reactor vessel;

1. In CONDITION 1, 2 or 3, from the suppression pool.

2. In CONDITION 4 or 5*;

a) From the suppression pool, or

b) When the suppression pool is being drained, from the condensate storage tank containing at least 150,000 gallons of water

APPLICABILITY: CONDITIONS 1, 2, 3, 4, and 5*.

ACTION

a. In CONDITION 1, 2 or 3;

1. With one CSS subsystem inoperable, POWER OPERATION may continue provided both LPCI subsystems are OPERABLE; restore the inoperable CSS subsystem to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

2. With both CSS subsystems inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

3. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

* The core spray system and the suppression chamber are not required to be OPERABLE provided that the reactor vessel head is removed and the cavity is flooded, the spent fuel pool gates are removed, and the water level is maintained within the limits of Specification 3.9.9 and 3.9.10.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

c. With one suppression chamber water level instrumentation channel inoperable, restore the inoperable channel to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours and verify the suppression chamber water level to be ≥ 12'2" at least once per 12 hours.

d. With both suppression chamber water level instrumentation channels inoperable, restore at least one inoperable channel to OPERABLE status within 6 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours and verify the suppression chamber water level to be ≥ 12'2" at least once per hour.

e. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.5.4.1 The suppression chamber shall be determined OPERABLE by verifying:

a. The water level to be ≥ 12'2" at least once per 24 hours.

b. Two suppression chamber water level instrumentation channels (2T48-R607A,B) OPERABLE by performance of a:

1. CHANNEL CHECK at least once per 24 hours,

2. CHANNEL FUNCTIONAL TEST at least once per 31 days, and

3. CHANNEL CALIBRATION at least once per 6 months.

4.5.4.2 The conditions of Specification 3.5.4.b.2 shall be verified to be satisfied prior to draining the suppression pool and at least once per 12 hours thereafter while the suppression pool is drained.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

d. In OPERATIONAL CONDITION 1 or 2 with THERMAL POWER > 1 percent of RATED THERMAL POWER and the average suppression chamber water temperature > 110°F, place the reactor mode switch in the Shutdown position.

e. With the average suppression chamber water temperature > 120°F and the main steam isolation valves closed following a scram from OPERATIONAL CONDITION 1 or 2, depressurize the reactor pressure vessel to < 200 psig at normal cooldown rates.

f. With one suppression chamber water level instrumentation channel inoperable, restore the inoperable channel to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

g. With both suppression chamber water level instrumentation channels inoperable, restore at least one inoperable channel to OPERABLE status within 6 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

h. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.6.2.1 The suppression chamber shall be demonstrated OPERABLE:

a. By verifying the suppression chamber water volume to be between 12 ft 2 in. and 12 ft 6 in. at least once per 24 hours

b. At least once per 24 hours in OPERATIONAL CONDITION 1 or 2 by verifying the average* suppression chamber water temperature to be ≤ 100°F.

c. At least once per 5 minutes in OPERATIONAL CONDITION 1 or 2 during testing which adds heat to the suppression chamber, by verifying the average* suppression chamber water temperature ≤ 105°F.

d. At least once per 60 minutes when THERMAL POWER > 1 percent of RATED THERMAL POWER and average* suppression chamber water temperature > 100°F, by verifying average* suppression chamber water temperature < 110°F.

*The average suppression chamber water temperature shall be determined using a weighted average of the suppression pool temperature sensors, as described in BASES subsection 3/4.6.2.

3/4.9.2 INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.9.2 At least 2 source range monitor* (SRM) channels shall be OPERABLE and inserted to the normal operating level:

a. Each with continuous visual indication in the control room,

b. At least one with an audible alarm in the control room,

c. One of the SRM detectors located in the quadrant where CORE ALTERATIONS are being performed and the other SRM detector located in an adjacent quadrant, and

d. The "shorting links" removed from the RPS circuity during CORE ALTERATIONS and shutdown margin demonstrations.

APPLICABILITY: CONDITION 5.

ACTION:

a. With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS** or positive reactivity changes and actuate the manual scram. The provisions of Specification 3.0.3 are not applicable.

b. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.9.2 Each of the above required SRM channels shall be demonstrated OPERABLE by:

a. At least once per 12 hours;

1. Performance of a CHANNEL CHECK,

2. Verifying the detectors are inserted to the normal operating level,

3. During CORE ALTERATIONS, verifying that the detector of an OPERABLE SRM channel is located in the core quadrant where CORE ALTERATIONS are being performed and one is located in the adjacent quadrant.

*The use of special movable detectors during CORE ALTERATIONS in place of the normal SRM nuclear detectors is permissible as long as these special detectors are connected to the normal SRM circuits.
**Except movement of SRM or special movable detectors.

BASES

It is permissible to remove a channel from service for a brief interval to conduct required surveillance testing. Notes that dictate the allowable time interval are provided in each ACTION section. An instrument channel that is removed from service for required surveillance testing may be considered inoperable for up to 6 hours in order to perform the required surveillances, prior to entering other applicable ACTIONS.

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

The reactor protection system automatically initiates a reactor scram to:

a. Preserve the integrity of the fuel cladding.

b. Preserve the integrity of the reactor coolant system.

c. Minimize the energy which must be adsorbed following a loss-of-coolant accident, and

d. Prevent inadvertent criticality.

This specification provides the limiting conditions for operation necessary to preserve the ability of the system to perform its intended function even during periods when instrument channels may be out of service because of maintenance. When necessary, one channel may be made inoperable for brief intervals to conduct the required surveillance tests.

The reactor protection system is made up of two independent trip systems. There are usually four channels to monitor each parameter with two channels in each trip system. The outputs of the channels in a trip system are combined in a logic so that either channel will trip that trip system. The tripping of both trip systems will produce a reactor scram. The system meets the intent of IEEE-279 for nuclear power plant protection systems. The bases for the trip settings of the RPS are discussed in the bases for Specification 2.2.1.

The measurement of response time at the specified frequencies provides assurance that the protective functions associated with each channel are completed within the time limit assumed in the accident analysis. No credit was taken 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 such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either: (1) inplace, onsite or offsite test measurements, or (2) utilizing replacement sensors with certified response times.

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Isolation Actuation Instrumentation Surveillance Requirements

Table 3.1-1 (Cont'd)

Scram Number (a)	Source of Scram Trip Signal	Operable Channels Required Per Trip System (b)	Scram Trip Setting	Source of Scram Signal is Required to be Operable Except as Indicated Below
12	Turbine Stop Valve Closure	4	≤10% valve closure from full open Tech Spec 2.1.A.3.	Automatically bypassed when turbine steam flow is below that corresponding to 30% of rated thermal power as measured by turbine first stage pressure.

Notes for Table 3.1-1

a. The column entitled "Scram Number" is for convenience so that a one-to-one relationship can be established between items in Table 3.1-1 and items in Table 4.1-1.

b.1. There shall be two operable or tripped trip systems for each potential scram signal. If the number of operable channels cannot be met for one of the trip systems, that trip system shall be tripped. ~~However, one trip signal channel of a trip system may be inoperable for up to two (2) hours during periods of required surveillance testing without tripping the associated trip system, provided that the other remaining channel(s) monitoring that parameter within that trip system is (are) operable.~~

c. Within 24 hours prior to the planned start of the hydrogen injection test 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 test. The background radiation level and associated trip setpoints may be adjusted during the test 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 establishing reactor power levels below 20% rated power.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable Actions, provided at least one operable channel in the same trip system is monitoring that parameter.

4.1 REACTOR PROTECTION SYSTEM (RPS)

Add "Insert A"

A. Testing and Calibration Requirements for the RPS

The minimum functional testing frequency used in this specification is based on a reliability analysis using the concepts developed in Reference 1 and the surveillance frequencies for ATTS equipment approved by the NRC in Reference 2. These concepts were specifically adapted to the one out of two taken twice logic of the reactor protection system. The analysis shows that the sensors are primarily responsible for the reliability of the reactor protection system. This analysis makes use of unsafe failure rate experience at conventional and nuclear power plants in a reliability model for the system. An unsafe failure is defined as one which negates channel operability and which, due to its nature, is revealed only when the channel is functionally tested or attempts to respond to a real signal. Failures such as blown fuses, ruptured bourdon tubes, faulted amplifiers, faulted cables, etc., which result in upscale or downscale readings on the reactor instrumentation are safe and will be easily recognized by the operators during operation because they are revealed by an alarm or a scram.

The channels listed in Table 4.1-1 are divided into four groups for functional testing. These are:

Group A. On-Off Sensors that provide a scram trip function.
Group B. Analog devices coupled with bi-stable trips that provide a scram function.
Group C. Devices which only serve a useful function during some restricted mode of operation, such as startup or shutdown, or for which the only practical test is one that can be performed at shutdown.
Group D. Analog transmitters and trip units that provide a scram trip function.

The sensors that make up Group A are specifically selected from among the whole family of industrial on-off sensors that have earned an excellent reputation for reliable operation. During design, a goal of 0.99999 probability of success at the 50% confidence level was adopted to assure that a balanced and adequate design is achieved. The probability of success is primarily a function of the sensor failure rate and the test interval. A three-month test interval was planned for Group A sensors. This is in keeping with good operating practices, and satisfies the design goal for the logic configuration utilized in the Reactor Protection System.

To satisfy the long-term objective of maintaining an adequate level of safety throughout the plant lifetime, a minimum goal of 0.9999 at the 95% confidence level is proposed. With the one out of two taken twice logic, this requires that each sensor have an availability of 0.993 at the 95% confidence level. This level of availability may be maintained by adjusting the test interval as a function of the observed failure history (Ref. 1). To facilitate the implementation of this technique, Figure 4.1-1 is provided to indicate an appropriate trend in test interval. The procedure is as follows:

1. Like sensors are pooled into one group for the purpose of data acquisition.

2. The factor M is the exposure hours and is equal to the number of sensors

Insert A (to P. 3.1-15)

The minimum functional test frequency and allowable outage time specified for RPS instrumentation are based on the NRC-approved reliability analyses performed in Reference 1. The analyses considered the Hatch-specific design, including the ATTS equipment discussed in References 2 and 3. Included in the Reference 1 analyses is justification for one instrument channel to be inoperable for up to 6 hours to perform required surveillances, provided at least one operable channel in the same trip system is monitoring that parameter, prior to entering other applicable Actions.

(Delete)

4.1.A.2. Test and Calibration Requirements for the APS (Continued)

in a group, n, times the elapsed time T, therefore M = n T.

3. The accumulated number of unsafe failures is plotted as an ordinate against M as an abscissa on Figure 4.1-1.

4. A test interval of one result will be used initially until a trend is established.

5. After a trend is established, the appropriate test interval to satisfy the goal will be the test interval to the left of the plotted points.

Group B devices utilize an analog sensor followed by an amplifier and a bistable trip circuit. The sensor and amplifier are active components and a failure is almost always accompanied by an alarm and an indication of the source of trouble. In the event of failure, repair or substitution can start immediately. An "as-is" failure is one that sticks mid-scale and is not capable of going either up or down in response to an out-of-limits in-put. This type of failure for analog devices is a rare occurrence and is detectable by an operator who observes that one signal does not track the other three. For purposes of analysis, it is assumed that this failure will be detected within two hours.

The bi-stable trip circuit which is a part of the Group B devices can sustain unsafe failures which are revealed only on test. Therefore, it is necessary to test them periodically.

A study was conducted of the instrumentation channels included in the Group B devices to calculate their "unsafe" failure rates. The analog devices (sensors and amplifiers) are predicted to have an unsafe failure rate of less than 20 x 10^{-6} failures/hour. The bi-stable trip circuits are predicted to have unsafe failure rate of less than 2 x 10^{-6} failures/hour. Considering the two hour monitoring interval for the analog devices as assumed above, and a weekly test interval for the bi-stable trip circuits, the design reliability goal of 0.99999 is attained with ample margin.

The bi-stable devices are monitored during plant operation to record their failure history and establish a test interval using the curve of Figure 4.1-1. There are numerous identical bi-stable devices used throughout the plant's instrumentation system. Therefore, significant data on the failure rates for the bi-stable devices should be accumulated rapidly.

The frequency of calibration of the APRM Flow Referencing Network has been established as once per operating cycle. There are several instruments which must be calibrated and it will take several hours to perform the calibration of the entire network. While the calibration is being performed, a zero flow signal will be sent to half of the APRM's resulting in a half scram and rod block condition. Thus, if the calibration were performed during operation, flux shaping would not be possible. Based on experience at other generating stations, drift of instruments, such as those in the Flow Referencing Network, is not significant and therefore, to avoid spurious scrams, a calibration frequency of once per operating cycle is established.

(Delete)

4.1.A. Test and Calibration Requirements for the RPS (Continued)

Group C devices are active only during a given portion of the operational cycle. For example, the IRM is active during startup and inactive during full-power operation. Thus, the only test that is meaningful is the one performed just prior to shutdown or startup; i.e., the tests that are performed just prior to use of the instrument.

Calibration frequency of the instrument channel is divided into two categories: They are as follows:

i. Passive type indicating devices that can be compared with like units on a continuous reference.

ii. Vacuum tube or semiconductor devices and detectors that drift or lose sensitivity.

Experience with passive type instruments in generating stations and substations indicates that the specified calibrations are adequate. For those devices which employ amplifiers, etc., drift specifications call for drift to be less than 0.4%/month; i.e., in the period of a month a drift of .4% could occur and still provide for adequate margin. For the APRM system, drift of electronic apparatus is not the only consideration in determining a calibration frequency. Change in power distribution and loss of chamber sensitivity dictate a calibration every seven (7) days. Calibration on this frequency assures plant operation at or below thermal limits.

The sensitivity of LPRM detectors decreases with exposure to neutron flux at a slow and approximately constant rate. This is compensated for in the APRM system by calibrating twice a week using heat balance data and by calibrating individual LPRM's every 1000 effective full power hours using TIP traverse data.

Group D devices consist of analog transmitters, master trip units, slave trip units, and other accessories. The general description of the ATTS devices is provided in Reference 3. As evidenced by NEDO-21617-A, the NRC has approved the following surveillance frequencies for ATTS equipment:

1. Once per shift for channel check
2. Once per month for channel functional test
3. Once per operating cycle for channel calibration

B. Maximum Fraction of Limiting Power Density (MFLPD)

This section deleted.

4.1.C. References

~~1. H. Jacobs, "Reliability of Engineered Safety Features as a Function of Testing Frequency," Nuclear Safety, Volume 9, No. 4, July-August, 1968, pp 303-312.~~

2. NEDO-21617-A, "Analog Transmitter/Trip Unit System for Engineered Safeguard Sensor Trip Inputs."

3. NEDE-22154-1, "Analog Trip System for Engineered Safeguard Sensor Trip Inputs - Edwin I. Hatch Nuclear Plant Units 1 and 2."

1. NEDC-30851P-A, "Technical Specification Improvement Analyses for BWR Protection System," March 1988.

(Delete)

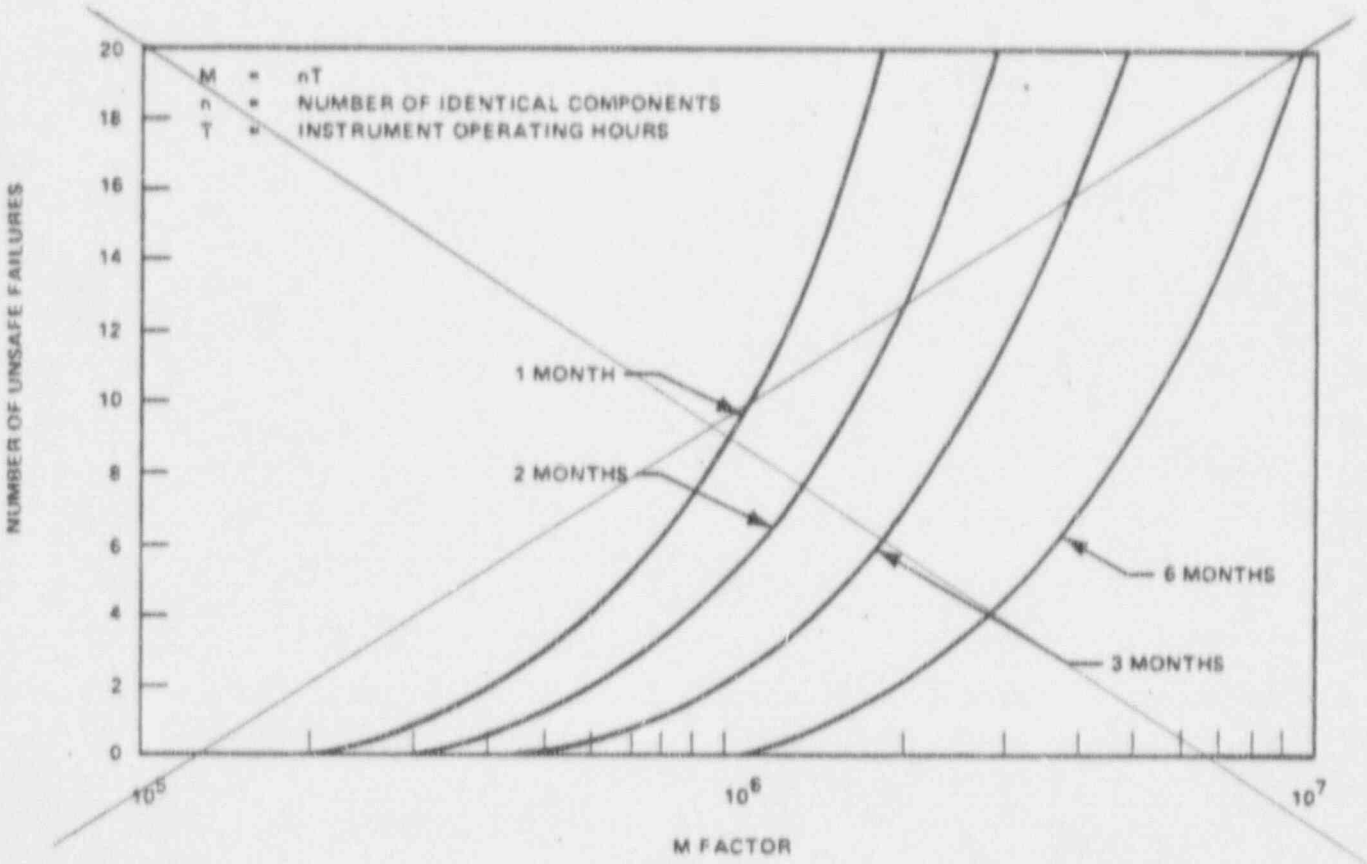

FIGURE 4.1-1. GRAPHICAL AID FOR THE SELECTION OF AN ADEQUATE INTERVAL BETWEEN TESTS.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS

3.2 PROTECTIVE INSTRUMENTATION

Applicability

The Limiting Conditions for Operation apply to the plant instrumentation which performs a protective function.

Objective

The objective of the Limiting Conditions for Operation is to assure the operability of protective instrumentation.

Specifications

The Limiting Conditions for Operation of the protective instrumentation affecting each of the following protective actions shall be as indicated in the corresponding LCO table.

4.2 PROTECTIVE INSTRUMENTATION

Applicability

The Surveillance Requirements apply to the instrumentation which performs a protective function.

Objective

The objective of the Surveillance Requirements is to specify the type and frequency of surveillance to be applied to protective instrumentation.

Specifications

The check, functional test, and calibration minimum frequency for protective instrumentation affecting each of the following protective actions shall be as indicated in the corresponding SR table.

	Protective Action	LCO Table	SR Table
A.	Initiates ~~Reactor Vessel and Containment~~ Isolation Actuation	3.2-1	4.2-1
B.	Initiates or Controls HPCI	3.2-2	4.2-2
C.	Initiates or Controls RCIC	3.2-3	4.2-3
D.	Initiates or Controls ADS	3.2-4	4.2-4
E.	Initiates or Controls the LPCI Mode of RHR	3.2-5	4.2-5
F.	Initiates or Controls Core Spray	3.2-6	4.2-6
G.	Initiates Control Rod Blocks	3.2-7	4.2-7
H.	Limits Radioactivity Release	3.2-8	4.2-8
I.	Initiates Recirculation Pump Trip	3.2-9	4.2-9
J.	Monitors Leakage Into the Drywell	3.2-10	4.2-10
K.	Provides Surveillance Information	3.2-11	4.2-11
L.	Initiates Disconnection of Offsite Power Sources	3.2-12	4.2-12
M.	Initiates Energization by Onsite Power Sources	3.2-13	4.2-13
N.	Arms the Low Low Set S/RV System	3.2-14	4.2-14

ISOLATION ACTUATION INSTRUMENTATION

Table 3.2-1

~~INSTRUMENTATION WHICH INITIATES REACTOR VESSEL AND PRIMARY CONTAINMENT ISOLATION~~

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Action to be taken if number of channels is not met for both trip systems (c)	Remarks (d)
1	Reactor Vessel Water Level	Low (Level 3) Narrow Range	2	≥ 0.0 inches	Initiate an orderly shutdown and achieve the Cold Shutdown Condition within 24 hours or isolate the shutdown cooling system.	Initiates Group 2 & 6 isolation.
		Low Low (Level 2)	2	≥-47 inches	Initiate an orderly shutdown and achieve the Cold Shutdown Condition within 24 hours.	Starts the SGTS, initiates Group 5 isolation, and initiates secondary containment isolation.
		Low Low Low (Level 1)	2	≥-113 inches	Initiate an orderly shutdown and achieve the Cold Shutdown Condition within 24 hours.	Initiates Group 1 isolation.
2	Reactor Vessel Steam Dome Pressure (Shutdown Cooling Mode)	Low Permissive	1	≤145 psig	~~Isolate shutdown cooling.~~	Isolates the shutdown cooling suction valves of the RHR system.
3	Drywell Pressure	High	2	≤1.92 psig	Initiate an orderly shutdown and achieve the Cold Shutdown Condition within 24 hours.	Starts the standby gas treatment system, initiates Group 2 isolation and secondary containment isolation.

Close the shutdown cooling supply isolation valves when steam dome pressure ≤ 145 psig

Also, with primary containment isolation signal, closes RHR (LPCI) inboard motor operated injection valves

(PROPOSED)

Table 3.2-1 (Cont.)

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Action to be taken if number of channels is not met for both trip systems (c)	Remarks (d)
13	HPCI Emergency Area Cooler Ambient Temperature	High	1	≤169°F	Close HPCI isolation valves and declare HPCI inoperable.	Closes isolation valves in HPCI system, trips HPCI turbine.
14	HPCI Steam Supply Pressure	Low	2	≥100 psig	Close HPCI isolation valves and declare HPCI inoperable.	Closes isolation valves in HPCI system, trips HPCI turbine.
15	HPCI Steam Line ΔP(Flow)	High	1	≤303% rated flow	Close HPCI isolation valves and declare HPCI inoperable.	Closes isolation valves in HPCI system, trips HPCI turbine.
16	HPCI Turbine Exhaust Diaphragm Pressure	High	X2	≤20 psig	Close HPCI isolation valves and declare HPCI inoperable.	Closes isolation valves in HPCI system, trips HPCI turbine.
17	HPCI Suppression Chamber Area Ambient Temperature	High	1	≤169°F	Close HPCI isolation valves and declare HPCI inoperable.	Closes isolation valves in HPCI system, trips HPCI turbine.
18	HPCI Suppression Chamber Area Differential Air Temperature	High	1	≤42°F	Close HPCI isolation valves and declare HPCI inoperable.	Closes isolation valves in HPCI system, trips HPCI turbine.
19	RCIC Emergency Area Cooler Ambient Temperature	High	1	≤169°F	Close RCIC isolation valves and declare RCIC inoperable.	Closes isolation valves in RCIC system, trips RCIC turbine.
20	RCIC Steam Supply Pressure	Low	2	≥60 psig	Close RCIC isolation valves and declare RCIC inoperable.	Closes isolation valves in RCIC system, trips RCIC turbine.

(PROPOSED)

Table 3.2-1 (Cont.)

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Action to be taken if number of channels is not met for both trip systems (c)	Remarks (d)
21	RCIC Steam Line ΔP (Flow)	High	1	≤306% rated flow	Close RCIC isolation valves and declare RCIC inoperable.	Closes isolation valves in RCIC system, trips RCIC turbine.
22	RCIC Turbine Exhaust Diaphragm Pressure	High	2	≤20 psig	Close RCIC isolation valves and declare RCIC inoperable.	Closes isolation valves in RCIC system, trips RCIC turbine.
23	RCIC Suppression Chamber Area Ambient Temperature	High	1	≤169°F	Close RCIC isolation valves and declare RCIC inoperable.	Closes isolation valves in RCIC system, trips RCIC turbine.
24	RCIC Suppression Chamber Area Differential Air Temperature	High	1	≤42°F	Close RCIC isolation valves and declare RCIC inoperable.	Closes isolation valves in RCIC system, trips RCIC turbine.

Insert B
to Table 3.2-1

Add to Note c.1:

"With the number of operable channels less than required by the Minimum Operable Channels per Trip System requirement for one trip system, either

1. place the inoperable channel(s) in the tripped condition* within 12 hours

OR

2. take the ACTION required by Table 3.2-1.

* With a design providing only one channel per trip system, an inoperable channel need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, the inoperable channel shall be restored to operable status within 2 hours or the ACTION required by Table 3.2-1 for that Trip Function shall be taken".

b.2. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable Actions.

Notes for Table 3.2-1

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between lines in Table 3.2-1 and items in Table 4.2-1.

b.1. Primary containment integrity shall be maintained at all times prior to withdrawing control rods for the purpose of going critical, when the reactor is critical, or when the reactor water temperature is above 212°F and fuel is in the reactor vessel except while performing low-power physics tests at atmospheric pressure at power levels not to exceed 5 MWt, or performing an inservice vessel hydrostatic or leakage test.

When primary containment integrity is required, there shall be two operable or tripped trip systems for each function.

When performing inservice hydrostatic or leakage testing on the reactor vessel with the reactor coolant temperature above 212°F, reactor vessel water level instrumentation associated with the low low (Level 2) trip requires two operable or tripped channels. The drywell pressure trip is not required because primary containment integrity is not required.

Add "Insert B"

c.1. ~~If the number of operable channels cannot be met for one of the trip systems, that trip system shall be tripped. However, one trip signal channel of a trip system may be inoperable for up to 2 hours during periods of required surveillance testing without tripping the associated trip system, provided that the other remaining channel(s) monitoring that same parameter within that trip system is (are) operable.~~

d. The valves associated with each Group Isolation are given in Table 3.7-1.

e. Within 24 hours prior to the planned start of the hydrogen injection test 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 test. The background radiation level and associated trip setpoints may be adjusted during the test 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 establishing reactor power levels below 20% rated power.

c.2. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable Actions.

Table 3.2-2

INSTRUMENTATION WHICH INITIATES OR CONTROLS HPCI

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks	
1.	Reactor Vessel Water Level	Low Low (Level 2)	2	≥-47 inches	Initiates HPCI; Also initiates RCIC.	I
2.	Drywell Pressure	High	2	≤ 1.92 psig	Initiates HPCI, Also initiates LPCI and Core Spray and provides a permissive signal to ADS.	I
3.	HPCI Turbine Overspeed	Mechanical	1	≤ 5000 rpm	Trips HPCI turbine	
4.	HPCI Turbine Exhaust Pressure	High	1	≤ 146 psig	Trips HPCI turbine	I
5.	HPCI Pump Suction Pressure	Low	1	≤ 12.6 inches Hg vacuum	Trips HPCI turbine	I
6.	Reactor Vessel Water Level	High (Level 8)	2	≤ +56.5 inches	Trips HPCI turbine	
7.	HPCI Pump Discharge Flow	High	1	≥ 870 gpm (≥ 9.04 inches)	Closes HPCI minimum flow bypass line to suppression chamber.	
		Low	1	≤ 605 gpm (≤ 4.36 inches)	Opens HPCI minimum flow bypass line if pressure permissive is present.	
8.	HPCI Emergency Area Cooler Ambient Temperature	High	1	≤ 169°F	Closes isolation valves in HPCI system, trips HPCI turbine.	

↳ Delete

8. Deleted.
9. Deleted.
10. Deleted.
11. Deleted.
12. Deleted.
13. Deleted.

Table 3.2-2 (Cont.)

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks	
9.	HPCI Steam Supply Pressure	Low	2	≥100 psig	Closes isolation valves in HPCI system, trips HPCI turbine.	I
10.	HPCI Steam Line ΔP (Flow)	High	1	≤303% rated flow	Close isolation valves in HPCI system, trips HPCI turbine.	
11.	HPCI Turbine Exhaust Diaphragm Pressure	High	1	≤20 psig	Close isolation valves in HPCI system, trips HPCI turbine.	I
12.	Suppression Chamber Area Ambient Temperature	High	1	≤169°F	Close isolation valves in HPCI system, trips HPCI turbine.	—
13.	Suppression Chamber Area Differential Air Temperature	High	1	≤42°F	Close isolation valves in HPCI system, trips HPCI turbine.	I
14.	Condensate Storage Tank Level	Low	2	≥0 inches	Automatic interlock switches suction from CST to suppression chamber.	
15.	Suppression Chamber Water Level	High	2	≤154.2 inches with respect to torus invert	Automatic interlock switches suction from CST to suppression chamber.	—
16.	HPCI Logic Power Failure Monitor		1	Not Applicable	Monitors availability of power to logic system.	

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-2 and items in Table 4.2-2.

b. 1. When any CCCS subsystem is required to be operable by Section 3.5, there shall be two operable trip systems. If the required number of operable channels cannot be met for one of the trip systems, place the inoperable channel in the tripped condition or declare the associated CCCS inoperable within ~~1 hour~~ 12 hours. If the required number of operable channels cannot be met for both trip systems, declare the associated CCCS inoperable within 1 hour.

b.2. One instrument channel may be inoperable ~~for~~ up to 6 hours to perform required Surveillances prior to entering other applicable Actions.

Table 3.2-1

INSTRUMENTATION WHICH INITIATES OR CONTROLS RCIC

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks	
1.	Reactor Vessel Water Level	Low Low (Level 2)	2	≥-47 inches	Initiates RCIC; also initiates HPCI.	—
2.	RCIC Turbine Overspeed	Electrical	1	≤110% rated	Trips RCIC turbine.	
		Mechanical	1	≤125% rated	Trips RCIC turbine.	
3.	RCIC Turbine Exhaust Pressure	High	1	≤+45 psig	Trips RCIC turbine.	—
4.	RCIC Pump Suction Pressure	Low	1	≤12.6 inches Hg Vacuum	Trips RCIC turbine.	—
5.	Reactor Vessel Water Level	High (Level 8)	2	≤+56.5 inches	Trips RCIC; automatically resets when water drops below level 8, system automatically restarts at level 2.	
6.	RCIC Pump Discharge Flow	High	1	>87 gpm (≥ 10.6 inches)	Closes RCIC minimum flow bypass line to suppression chamber.	—
		Low	1	≤53 gpm (≤ 3.87 inches)	Opens RCIC minimum flow bypass line if pressure permissive is present.	—
7.	RCIC Emergency Area Cooler Ambient Temperature	High	1	≤169°F	Closes isolation valves in RCIC system, trips RCIC turbine.	—

Delete

7. Deleted.
8. Deleted.
9. Deleted.
10. Deleted.
11. Deleted.
12. Deleted

Amendment No. 27, 87, 92, 102, 121

Table 3.2-3 (Continued)

Delete

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks	
8.	RCIC Steam Supply Pressure	Low	2	≥60 psig	Closes isolation valves in RCIC system, trips RCIC turbine.	I
9.	RCIC Steam Line ΔP (Flow)	High	1	≤306% rated flow	Closes isolation valves in RCIC system, trips RCIC turbine.	—
10.	RCIC Turbine Exhaust Diaphragm Pressure	High	1	≤20 psig	Closes isolation valves in RCIC system, trips RCIC turbine.	I
11.	Suppression Chamber Area Ambient Temperature	High	1	≤169°F	Closes isolation valves in RCIC system, trips RCIC turbine.	—
12.	Suppression Chamber Area Differential Air Temperature	High	1	≤42°F	Closes isolation valves in RCIC system, trips RCIC turbine.	I
13.	RCIC Logic Power Failure Monitor		1	Not Applicable	Monitors availability of power to logic system.	I
14.	Condensate Storage Tank Water Level	Low	2	≥0"	Transfers suction from CST to suppression pool.	I
15.	Suppression Pool Water Level	High	2	≤0"	Transfers suction from CST to suppression pool.	I

NOTES FOR TABLE 3.2-3

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-3 and items in Table 4.2-3.

b.1. When any CCCS subsystem is required to be operable by Section 3.5. there shall be two operable trip systems. If the required number of operable channels cannot be met for one of the trip systems, place the inoperable channel in the tripped condition or declare the associated CCCS inoperable within ~~1 hour.~~ 12 hours. If the required number of operable channels cannot be met for both trip systems, declare the associated CCCS inoperable within 1 hour.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable Actions.

Table 3.2-4

INSTRUMENTATION WHICH INITIATES OR CONTROLS ADS

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks
1.	Reactor Vessel Water Level	Low (Level 3)	1	≥0.0 inches	Confirms low level, ADS permissive
	Reactor Vessel Water Level	Low Low Low (Level 1)	2	≥-113 inches	Permissive signal to ADS timer
2.	Drywell Pressure	High	2	≤1.92 psig	Permissive signal to ADS timer
3.	RHR Pump Discharge Pressure	High	2	≥112 psig	Permissive signal to ADS timer
4.	CS Pump Discharge Pressure	High	2	≥137 psig	Permissive signal to ADS timer
5.	Auto Depressurization Low Water Level Timer		2	≤13 minutes	Bypasses high drywell pressure permissive upon sustained Level 1
6.	Auto Depressurization Timer		1	120 ± 12 seconds	With Level 3 and Level 1 and high drywell pressure and CS or RHR pump at pressure, timing sequence begins. If the ADS timer is not reset it will initiate ADS.
7.	Automatic Blowdown Control Power Failure Monitor		1	Not applicable	Monitors availability of power to logic system

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-4 and items in Table 4.2-4.

b. 1. When any CCCS subsystem is required to be operable by Section 3.5, there shall be two operable trip systems. If the required number of operable channels cannot be met for one of the trip systems, place the inoperable channel in the tripped condition or declare the associated CCCS inoperable within ~~1 hour.~~ 12 hours. If the required number of operable channels cannot be met for both trip systems, declare the associated CCCS inoperable within 1 hour.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable Actions.

Amendment No. 103, 121, 129, 173

Table 3.2-5

INSTRUMENTATION WHICH INITIATES OR CONTROLS THE LPCI MODE OF RHR

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks
1.	Reactor Vessel Water Level	Low Low Low (Level 1)	2	≥-113 inches	Initiates LPCI mode of RHR
2.	Drywell Pressure	High	2	≤1.92 psig	Initiates LPCI mode of RHR. Also initiates HPCI and Core Spray and provides a permissive signal to ADS.
3.	Reactor Vessel Steam Dome Pressure (Delete)	Low Permissive	1	≤145 psig	With primary containment isolation signal, closes RHR (LPCI) inboard motor operated injection valves
3.a.	Reactor Vessel Steam Dome Pressure	Low	2	≥335 psig	Permissive to close Recirculation Discharge Valve and Bypass Valve
b.	Reactor Vessel Steam Dome Pressure	Low	2	≥422 psig*	Permissive to open LPCI injection valves
4.	Reactor Shroud Water Level	Low (Level 0)	1	≥-202 inches	Acts as permissive to divert some LPCI flow to containment spray
5.	LPCI Cross Connect Valve Open Annunciator	N/A	1	Valve not closed	Initiates annunciator when valve is not closed

*This trip function shall be ≤500 psig.

Note: for Table 3.2-5

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-5 and item in Table 4.2-5.

b. 1. When any CCCS subsystem is required to be operable by Section 3.5, there shall be two operable trip systems. If the required number of operable channels cannot be met for one of the trip systems, place the inoperable channel in the tripped condition or declare the associated CCCS inoperable within ~~1 hour~~ 12 hours. If the required number of operable channels cannot be met for both trip systems, declare the associated CCCS inoperable within 1 hour.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable Actions.

Table 3.2-6

INSTRUMENTATION WHICH INITIATES OR CONTROLS CORE SP

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Remarks
1.	Reactor Vessel Water Level	Low Low Low (Level 1)	2	≥-113 inches	Initiates CS.
2.	Drywell Pressure	High	2	≤1.92 psig	Initiates CS. Also initiates HPCI and LPCI mode of RHR and provides a permissive signal to ADS.
3.	Reactor Vessel Steam Dome Pressure	Low	2	≥422 psig*	Permissive to open CS injection valves.
4.	Core Spray Sparger Differential Pressure		1(c)	≤ 3.1 psid greater (less negative) than the normal indicated ΔP at rated core power and flow.	Monitors integrity of CS piping inside vessel (between the nozzle and core shroud).
5.	CS Pump Discharge Flow	Low	1	≥610 gpm (≥ 4.13 inches)	Minimum flow bypass line is closed when low flow signal is not present.
6.	Core Spray Logic Power Failure Monitor		1	Not Applicable	Monitors availability of power to logic system.

*This trip function shall be ≤500 psig.

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-6 and items in Table 4.2-6.

b.1. When any CCCS subsystem is required to be operable by Section 3.5, there shall be two operable trip systems. If the required number of operable channels cannot be met for one of the trip systems, place the inoperable channel in the tripped condition or declare the associated CCCS inoperable within ~~1 hour.~~ 12 hours. If the required number of operable channels cannot be met for both trip systems, declare the associated CCCS inoperable within 1 hour.

c. Alarm only. When inoperable, verify that the core spray differential pressure is within limits at least once per 12 hours or, declare the associated core spray loop inoperable.

b.2 One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable Actions.

Amendment No. 102, 121, 146, 170

Table 3.2-7 (Continued)

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (e)(f)	Trip Setting	Remarks
4.	RBM	Upscale			
		Low Trip Setpoint (LTSP)		≤117/125 of full scale	There are three upscale trip levels. Only one is applied over a specified operating core thermal power range. All RBM trips are automatically bypassed below the low power setpoint. The upscale LTSP is applied between the low power and the intermediate power setpoints. The upscale ITSP is applied between the intermediate power setpoint and the high power setpoint. The upscale HTSP is applied above the high power setpoint.
		Intermediate Trip Setpoint (ITSP)		≤111.2/125 of full scale	
		High Trip Setpoint (HTSP)		≤107.4/125 of full scale	
		Power Range Setpoints	Not applicable		Power range setpoints control the enforcement of the appropriate upscale trips over the proper core thermal power ranges. The power signal to the RBM is provided by the APRM.
		Low Power Setpoint (LPSP)		≤30% rated core thermal power	
		Intermediate Power Setpoint (IPSP)		≤65% rated core thermal power	
		High Power Setpoint (HPSP)		≤85% rated core thermal power	
		Bypass Time Delay (td_2)	Not applicable	≤2.0 seconds	RBM bypass time delay is set low enough to assure minimum rod movement while upscale trips are bypassed.
5.	Scram Discharge Volume	High Water Level	1(g)(h)	≤18 gallons	

Notes for Table 3.2-7

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-7 and items in Table 4.2-7.

b. 1. For the START & HOT STANDBY position of the Mode Switch, there shall be two operable or tripped systems for each potential trip condition. If the requirements established by the column cannot be met for one of the two trip systems, the condition may exist for up to seven days provided that during that time the operable system is functionally tested immediately and daily thereafter; if this condition lasts longer than seven days, the system shall be tripped. If the requirements established by this column cannot be met for both trip systems, the systems shall be tripped.

c. One of the four SRM inputs may be bypassed.

d. The SRM and IRM blocks need not be operable in the Run Mode. This function is bypassed when the Mode Switch is placed in the RUN position.

e. The APRM and RBM rod blocks need not be Operable in the Start & Hot Standby Mode (Except 12% APRM Rod Block).

f. The RBM is only required when core thermal power is ≥30% and the limiting condition defined in Section 3.3.f exists.

g. This trip is Operable in Power Operation and Hot Standby Mode, and Refuel Mode when any control rod is withdrawn. Not applicable to control rods removed per Specification 3.10.E.

h. Withdrawal of control rods is not permitted during required surveillance testing.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering OPERATIONAL CONDITION for which applicable Actions.

Table 3.2-8 (cont.)

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System (b)	Trip Setting	Action to be taken if there are not two operable or tripped trip systems	Remarks
5.	Main Steam Line Radiation Monitor	Hi	2	≤3 times normal full power background (*)	Isolate the mechanical vacuum pump and the gland seal condenser exhauster	One trip per trip logic system will isolate the mechanical vacuum pump and the gland seal condenser exhauster.

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-8 and items in Table 4.2-8.

b.1. Whenever the systems are required to be operable, there shall be two operable or tripped trip systems. If this cannot be met, the indicated action shall be taken.

c. In the event that both off-gas post treatment radiation monitors become inoperable, the reactor shall be placed in the Cold Shutdown within 24 hours unless one monitor is sooner made operable, or adequate alternative monitoring facilities are available.

d. From and after the date that one of the two off-gas post treatment radiation monitors is made or found to be inoperable, continued reactor power operation is permissible during the next fourteen days (the allowable repair time), provided that the inoperable monitor is tripped in the downscale position.

e. Within 24 hours prior to the planned start of the hydrogen injection test 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 test. The background radiation level and associated trip setpoints may be adjusted during the test 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 establishing reactor power levels below 20% rated power.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable Actions.

Table 3.2-9

INSTRUMENTATION WHICH INITIATES RECIRCULATION PUMP TRIP

Ref. No. (a)	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System	Trip Setting	Remarks
1.	Reactor Vessel Water Level (ATWS RPT)[c]	Low (Level 2)	2[b][g]	≥ 47 inches H_2O	Power must be reduced and the mode switch placed in a mode other than the RUN Mode.
2.	Reactor Pressure (ATWS RPT)	High	2[b][g]	≤1095 psig	Power must be reduced and the mode switch placed in a mode other than the RUN Mode.
3.	EOC - RPT[d]	1. Turbine Stop Valve Closure 2. Turbine Control Valve Fast Closure	2[e][f]	1. Stop Valve ≤90% Open 2. Control Valve Hydraulic Press Trip Point	Trips recirculation pumps on turbine control valve fast closure or stop valve closure when reactor is > 30%.[e]

(a) The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-9 and items in Table 4.2-9.

(b) Whenever the reactor is in the RUN Mode, there shall be two operable trip systems for each parameter for each operating recirculation pump. If the required number of operable channels cannot be met for one of the trip systems, place the inoperable channel in the tripped condition or take the indicated action within 14 days. If the required number of operable channels cannot be met for both trip systems, take the indicated action within 1 hour.

(c) Anticipated Transients Without Scram - Recirculation Pump Trip

(d) End of Cycle - Recirculation Pump Trip

(e) Either of these two EOC - RPT systems can trip both recirculation pumps. Each EOC - RPT system will trip if 2-out-of-2 fast closure signals or 2-out-of-2 stop valve signals are received.

(f) The requirement for these channels applies from EOC-2000 MWD/t to EOC. The RPT system may be placed in an inoperable status for up to 2 hours to provide the required monthly surveillance. If one EOC-RPT system is inoperable for longer than 72 hours or if both EOC-RPT systems are simultaneously inoperable, an orderly power reduction will be immediately initiated and reactor power will be <30% within the next 6 hours.

(g) Either of these two ATWS-RPT systems can trip both recirculation pumps. Each ATWS-RPT system will trip if 2-out-of-2 reactor low water level signals or 2-out-of-2 reactor high pressure signals are received.

(b) 2. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable Actions.

(f) 2. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable Actions.

Amendment No. 76, 103, 169

Table 3.2-10

INSTRUMENTATION WHICH MONITORS LEAKAGE INTO THE DRYWELL

Ref. No. (a)	Instrument (c)	Required Operable Channels per System	Setting	Remarks
1	Drywell Equipment Drain Sump Flow Integrator	1(b)(d)	Tech Spec 3.6.G.1.	The Limiting Conditions for operation of the Leakage Detection System are provided in Section 3.6.G.
2	Drywell Floor Drain Sump Flow Integrator	1(b)(d)	Tech Spec 3.6.G.1.	
3	Scintillation Detector for Monitoring Air Particulates	1(d)	(e)	
4	Scintillation Detector for Monitoring Radioiodine	1(d)	(e)	
5	GM Tubes for Monitoring Noble Gases	1(d)	(e)	

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-10 and items in Table 4.2-10.

b.1. Whenever the systems are required to be operable, there shall be one operable or tripped system. If this cannot be met, the indicated action shall be taken.

c. The two flow integrators, one for the equipment drain sump and the other for the floor drain sump, comprise one basic instrument system. Two sodium-iodide scintillation detectors, one for monitoring air particulates and one for monitoring radioiodine, comprise two basic instrument systems. A beta sensitive GM detector for monitoring noble gases comprises a fourth basic instrument system. An alternate system to determine the leakage flow is a manual system whereby the time between sump pump starts is monitored. This time interval will determine the leakage flow because the volume of the sump is known.

d. For administrative information; performs no control function.

e. High setpoint alarm will be set three times above background radiation. Failure alarm will be set below background radiation. Specific values will be established during system startup.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable Actions.

NOTES FOR TABLE 3.2-11

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-11 and items in Table 4.2-11.

b. Limiting Conditions for Operation for the Neutron Monitoring System are listed in Table 3.2-7.

c.1. With one or more of the monitoring channels inoperable, either restore the inoperable channel(s) to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours.

Continued operation is permissible for seven days from and after the date that one of these parameters is not indicated in the control room. Surveillance of local panels will be substituted for indication in the control room during the seven days.

d. Drywell and Suppression Chamber Pressure are each recorded on the same recorders. Each output channel has its own recorder.

Drywell and Suppression Chamber air temperature and suppression chamber water temperature are all recorded on the same recorders. Each output channel has its own recorder. Each recorder takes input from several temperature elements.

Hydrogen and Oxygen are indicated on one recorder. The recorder has two pens, one pen for each parameter.

Each channel of the post LOCA radiation monitoring system includes two detectors; one located in the drywell and the other in the suppression chamber. Each detector feeds a signal to a separate log count rate meter. The meter output goes to a two pen recorder. One high radiation level alarm is provided per channel and annunciation of alarm is provided in the control room.

High Range Drywell Pressure and High Range Drywell Radiation are recorded on the same recorders. Each output channel has its own recorder.

e.1. In the event that all indications of this parameter is disabled and such indication cannot be restored in six (6) hours, an orderly shutdown shall be initiated and the reactor shall be in a Hot Shutdown condition in six (6) hours and a Cold Shutdown condition in the following eighteen (18) hours.

f.1. If either the primary or secondary indication is inoperable, the torus temperature will be monitored at least once per shift to observe any unexplained temperature increase which might be indicative of an open SRV. With both the primary and secondary monitoring channels of two or more SRVs inoperable either restore sufficient inoperable channels such that no more than one SRV has both primary and secondary channels inoperable within 7 days or be in at least hot shutdown within the next 12 hours.

c.2
e.2
f.2

One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable Actions.

NOTES FOR TABLE 3.2-11 (Continued)

g.1. With the plant in the power operation, startup, or hot shutdown condition and with the number of operable channels less than the required operable channels, initiate the preplanned alternate method of monitoring the appropriate parameter within 72 hours and:

a1. either restore the inoperable channel(s) to operable status within 7 days of the event, or

b2. prepare and submit a special report to the NRC pursuant to Specification 6.9.2, within 14 days following the event outlining the action taken, the cause of the inoperability, and the plans and schedule for restoring the system to operable status.

h. A channel contains two detectors: one for mid-range noble gas, and one for high range noble gas. Both detectors must be operable to consider the channel operable.

i. Instrumentation shall be operable with continuous sampling capability within 30 minutes of an ECCS actuation during a LOCA. See Section 3.7.A.6.c for the LIMITING CONDITION FOR OPERATION.

g.2. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable Actions.

TABLE 3.2-12

INSTRUMENTATION WHICH INITIATES THE DISCONNECTION OF OFFSITE POWER SOURCES

Ref. No. (a)	Instrument (b)	Required Operable Channels	Channels Required To Trip	Trip Setting	Action to be Taken if the Number of Required Operable Channels Is Not Met
1	4.16 kv Emergency Bus Undervoltage Relay (Loss of Voltage Condition)	2/Bus	2/Bus	greater than or equal to 2800 volts. At 2800 volts time delay will be less than or equal to 6.5 sec.	(c)
2	4.16 kv Emergency Bus Undervoltage Relay (Degraded Voltage Condition)	2/Bus	2/Bus	greater than or equal to 3280 volts. At 3280 volts time delay will be less than or equal to 21.5 sec.	(c)

NOTES FOR TABLE 3.2-12

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-12 and items in Table 4.2-12.

b. This instrumentation is required to be operable during reactor startup, power operation, and hot shutdown.

c.1. With the number of operable channels one less than the required operable channels, operation may proceed until performance of the next required instrument functional test provided a trip signal is placed in the LOSP lock-out relay logic for the applicable inoperable channel.

c.2. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable Actions.

Table 3.2-14

INSTRUMENTATION WHICH ARMS LOW LOW SET S/RV SYSTEM

Ref No.[a]	Instrument	Trip Condition Nomenclature	Required Operable Channels per Trip System	Trip Setting	Remarks
1.	Reactor Vessel Steam Dome Pressure	High	2[b]	≤1054 psig	
2.	Relief/Safety Valve Tailpipe Pressure	High	2/valve	85, +15, -5 psig	The limiting condition of operation of these switches is provided in Specification 3.6.H.1.

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in table 3.2-14 and items in table 4.2-14.

b.1. With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place the inoperable channel in the tripped condition or declare the associated system inoperable within one hour. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, declare the associated system inoperable within one hour.

b.2. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable Actions.

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

Table 4.2-1

~~Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Initiates Reactor Vessel and Primary Containment Isolation~~

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
1	Reactor Vessel Water Level (Levels 1, 2, and 3)	Once/shift	Once/~~month~~ quarter	Once/operating cycle
2	Reactor Vessel Steam Dome Pressure (Shutdown Cooling Mode)	Once/shift	Once/~~month~~ quarter	Once/operating cycle
3	Drywell Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
4	Main Steam Line Radiation	None	Once/week (e)	Every 3 months (f)
5	Main Steam Line Pressure	None	~~(d)~~ N/A	Every 3 months
6	Main Steam Line Flow	Once/shift	Once/~~month~~ quarter	Once/operating cycle
7	Main Steam Line Tunnel Temperature	Once/shift	Once/~~month~~ quarter	Once/operating cycle
8	Reactor Water Cleanup System Differential Flow	None	~~(d)~~ N/A	Every 3 months
9	Reactor Water Cleanup Area Temperature	Once/shift	Once/~~month~~ quarter	Once/operating cycle

Table 4.2-1 (Cont'd)

Ref. No. [a]	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency [b]	Instrument Calibration Minimum Frequency [c]
10	Reactor Water Cleanup Area Ventilation Differential Temperature	Once/shift	Once/~~month~~ quarter	Once/operating cycle
11	Condenser Vacuum	None	~~[d]~~ N/A	Every 3 months
12	Drywell Radiation	Once/~~day~~ shift	Once/~~month~~[e] quarter	Once/operating cycle

Add Insert C →

Notes for Table 4.2-1

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-1 and items in Table 3.2-1.

b. Instrument functional tests are not required when the instruments are not required to be operable or are tripped. However, if functional tests are missed, they shall be performed prior to returning the instrument to an operable status.

c. Calibrations are not required when the instruments are not required to be operable. However, if calibrations are missed, they shall be performed prior to returning the instrument to an operable status.

e. Initially once per month or according to Figure 4.1-1 with an interval of not less than one month nor more than three months. The compilation of instrument failure rate data may include data obtained

d. Deleted.

Insert C (to P. 3.2-25)

13	HPCI Emergency Area Cooler Ambient Temperature	Once/shift	Once/quarter	Once/operating cycle
14	HPCI Steam Supply Pressure	Once/shift	Once/quarter	Once/operating cycle
15	HPCI Steam Line ΔP (Flow)	Once/shift	Once/quarter	Once/operating cycle
16	HPCI Turbine Exhaust Diaphragm Pressure	Once/shift	Once/quarter	Once/operating cycle
17	HPCI Suppression Chamber Area Ambient Temperature	Once/shift	Once/quarter	Once/operating cycle
18	HPCI Suppression Chamber Area Differential Air Temperature	Once/shift	Once/quarter	Once/operating cycle
19	RCIC Emergency Area Cooler Ambient Temperature	Once/shift	Once/quarter	Once/operating cycle
20	RCIC Steam Supply Pressure	Once/shift	Once/quarter	Once/operating cycle
21	RCIC Steam Line ΔP (Flow)	Once/shift	Once/quarter	Once/operating cycle
22	RCIC Turbine Exhaust Diaphragm Pressure	Once/shift	Once/quarter	Once/operating cycle
23	RCIC Suppression Chamber Area Ambient Temperature	Once/shift	Once/quarter	Once/operating cycle
24	RCIC Suppression Chamber Area Differential Air Temperature	Once/shift	Once/quarter	Once/operating cycle

Notes for Table 4.2-1 (Cont'd)

Delete

from other BWR's for which the same design instrument operates in an environment similar to that of HNP-1. The failure rate data must be reviewed and approved by the AEC prior to any change in the once-a-month frequency.

e. This instrumentation is exempted from the instrument functional test definition. This instrument functional test will consist of injecting a simulated electrical signal into the measurement channels.

f. Standard current source used which provides an instrument channel alignment. Calibration using a radiation source shall be made once per operating cycle.

Logic system functional tests and simulated automatic actuation shall be performed once each operating cycle for the following:

1. Main Steam Line Isolation Valves
2. Main Steam Line Drain Valves
3. Reactor Water Sample Valves
4. RHR - Isolation Valve Control
5. Shutdown Cooling Valves
6. Head Spray
7. Drywell Equipment Sump Discharge to Radwaste
8. Reactor Water Cleanup Isolation
9. Drywell Isolation Valves
10. TIP Withdrawal
11. Atmospheric Control Valves
12. Sump Drain Valves
13. Standby Gas Treatment
14. Reactor Building Isolation

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

Table 4.2-2

Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Initiates or Controls HPCI

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
1	Reactor Vessel Water Level (Level 2)	Once/shift	Once/~~month~~ quarter	Once/operating cycle
2	Drywell Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
3	HPCI Turbine Overspeed	None	N/A	Once/operating cycle
4	HPCI Turbine Exhaust Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
5	HPCI Pump Suction Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
6	Reactor Vessel Water Level (Level 8)	Once/shift	Once/~~month~~ quarter	Once/operating cycle
7	HPCI Pump Discharge Flow	Once/shift	Once/~~month~~ quarter	Once/operating cycle
8	HPCI Emergency Area Cooler Ambient Temperature	Once/shift	Once/month	Once/operating cycle
9	HPCI Steam Supply Pressure	Once/shift	Once/month	Once/operating cycle

8. Deleted.
9. Deleted.
10. Deleted.
11. Deleted.
12. Deleted.
13. Deleted.

Table 4.2-2 (Cont'd)

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
10	HPCI Steam Line ΔP (Flow)	Once/shift	Once/month	Once/operating cycle
11	HPCI Turbine Exhaust Diaphragm Pressure	Once/shift	Once/month	Once/operating cycle
12	Suppression Chamber Area Ambient Temperature	Once/shift	Once/month	Once/operating cycle
13	Suppression Chamber Area Differential Air Temperature	Once/shift	Once/month	Once/operating cycle
14	Condensate Storage Tank Level	None	~~(d)~~ N/A	Every 3 months
15	Suppression Chamber Water Level	Once/shift	Once/~~month~~ quarter	Once/operating cycle
16	HPCI Logic Power Failure Monitor	None	Once/operating cycle	None

Notes for Table 4.2-2

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-2 and items in Table 3.2-2.

Notes for Table 4.2-2 (Cont'd)

b. Instrument functional tests are not required when the instruments are not required to be operable or are tripped. However, if functional tests are missed, they shall be performed prior to returning the instrument to an operable status.

c. Calibrations are not required when the instruments are not required to be operable. However, if calibrations are missed, they shall be performed prior to returning the instrument to an operable status.

d. Initially once per month or according to figure 4.1-1 with an interval of not less than one month nor more than three months. The compilation of instrument failure rate data may include data obtained from other BWR's for which the same design instrument operates in an environment similar to that of HNP-1. The failure rate data must be reviewed and approved by the AEC prior to any change in the once-a-month frequency.

d. Deleted.

Logic system functional tests and simulated automatic actuation shall be performed once each operating cycle for the following:

1. HPCI Subsystem
2. HPCI Subsystem Auto Isolation
3. Diesel Generator Initiation
4. Area Cooling for Engineered Safeguard Systems

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

Table 4.2-3

Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Initiates or Controls RCIC

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
1	Reactor Vessel Water Level (Level 2)	Once/shift	Once/~~month~~ quarter	Once/operating cycle
2	RCIC Turbine Overspeed Electrical/ Mechanical	None None	N/A N/A	Once/operating cycle Once/operating cycle
3	RCIC Turbine Exhaust Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
4	RCIC Pump Suction Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
5	Reactor Vessel Water Level (Level 8)	Once/shift	Once/~~month~~ quarter	Once/operating cycle
6	RCIC Pump Discharge Flow	Once/shift	Once/~~month~~ quarter	Once/operating cycle
7	RCIC Emergency Area Cooler AmbientTemperature	Once/shift	Once/month	Once/operating cycle
8	RCIC Steam Supply Pressure	Once/shift	Once/month	Once/operating cycle

Delete.

7. Deleted.

8 Deleted.

9 Deleted.

10 Deleted.

11 Deleted.

12 Deleted.

TABLE 4.2-3 (Continued)

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
9	RCIC Steam Line ΔP (Flow)	Once/shift	Once/month	Once/operating cycle
10	RCIC Turbine Exhaust Diaphragm Pressure	Once/shift	Once/month	Once/operating cycle
11	Suppression Chamber Area Ambient Temperature	Once/shift	Once/month	Once/operating cycle
12	Suppression Chamber Area Differential Air Temperature	Once/shift	Once/month	Once/operating cycle
13	RCIC Logic Power Failure Monitor	None	Once/operating cycle	None
14	Condensate Storage Tank Level	None	~~Monthly~~ Once/quarter	Every 3 months
15	Suppression Pool Water Level	None	~~Monthly~~ Once/quarter	Every 3 months

Notes for Table 4.2-3

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-3 and items in Table 3.2-3.

b. Instrument functional tests are not required when the instruments are not required to be operable or are tripped. However, if functional tests are missed, they shall be performed prior to returning the instrument to an operable status.

Table 4.2-4

Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Initiates or Controls ADS

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
1	Reactor Vessel Water Level (Level 3)	Once/shift	Once/~~month~~ quarter	Once/operating cycle
	Reactor Vessel Water Level (Level 1)	Once/shift	Once/~~month~~ quarter	Once/operating cycle
2	Drywell Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
3	RHR Pump Discharge Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
4	CS Pump Discharge Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
5	Auto Depressurization Low Water Level Timer	None	N/A	Once/operating cycle
6	Auto Depressurization Timer	None	N/A	Once/operating cycle
7	Automatic Blowdown Control Power Failure Monitor	None	Once/operating cycle	None

Notes for Table 4.2-4

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-4 and items in Table 3.2-4.

Table 4.2-5

Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Initiates or Controls the LPCI Mode of RHR

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
1	Reactor Vessel Water Level (Level 1)	Once/shift	Once/~~month~~ quarter	Once/operating cycle
2	Drywell Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
3	a. Reactor Vessel Steam Dome Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
4	Reactor Shroud Water Level (Level 0)	Once/shift	Once/~~month~~ quarter	Once/operating cycle
5	LPCI Cross Connect Valve Open Annunciator	None	Once/Operating cycle	None
6	RHR (LPCI) Pump Flow	Once/shift	Once/~~month~~ quarter	Once/operating cycle
7	RHR (LPCI) Pump Start Timers	None	N/A	Once/operating cycle
8	Valve Selection Timers	None	N/A	Once/operating cycle
9	RHR Relay Logic Power Failure Monitor	None	Once/operating cycle	None
	b. Reactor Vessel Steam Dome Pressure	Once/shift	Once/quarter	Once/operating cycle

Table 4.2-6

Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Initiates or Controls Core Spray

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency (b)	Instrument Calibration Minimum Frequency (c)
1	Reactor Vessel Water Level (Level 1)	Once/shift	Once/~~month~~ quarter	Once/operating cycle
2	Drywell Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
3	Reactor Vessel Steam Dome Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
4	Core Spray Sparger Differential Pressure	Once/day	N/A	Once/operating cycle
5	CS Pump Discharge Flow	Once/shift	Once/~~month~~ quarter	Once/operating cycle
6	Core Spray Logic Power Failure Monitor	None	Once/operating cycle	None

Notes for Table 4.2-6

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-6 and items in Table 3.2-6.

Table 4.2-7

Check, Functional Test, and Calibration Minimum Frequency for Neutron Monitoring Instrumentation Which Initiates Control Rod Blocks

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency (b)	Instrument Functional Test Minimum Frequency (c)	Instrument Calibration Minimum Frequency (d)
1	SOURCE RANGE MONITORS			
	a. Detector not full in	NA	S/U(f), W	NA
	b. Upscale	NA	S/U(f), W	R
	c. Inoperative	NA	S/U(f), W	NA
	d. Downscale	NA	S/U(f), W	R
2	INTERMEDIATE RANGE MONITORS			
	a. Detector not full in	NA	S/U(f), W(e)	NA
	b. Upscale	NA	S/U(f), W(e)	R
	c. Inoperative	NA	S/U(f), W(e)	NA
	d. Downscale	NA	S/U(f), W(e)	R
3	APRM			
	a. Flow Referenced Simulated Thermal Power-Upscale	NA	S/U(f), Q	R
	b. Inoperative	NA	S/U(f), Q	NA
	c. Downscale	NA	S/U(f), ~~M~~ Q	R
	d. Neutron Flux - High, 12%	NA	S/U(f), Q	R
4	ROD BLOCK MONITOR			
	a. Upscale	NA	S/U(f), Q	R
	b. Inoperative	NA	S/U(f), Q	NA
	c. Downscale	NA	S/U(f), Q	R
5	SCRAM DISCHARGE VOLUME			
	a. Water Level-High	NA	Q	R

Notes for Table 4.2-7

a. The column titled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-7 and items in Table 3.2-7.

b. Deleted.

Table 4.2-8

Check, Functional Test, and Calibration Minimum Frequency for Radiation Monitoring Systems Which Limit Radioactivity Release

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency (b)	Instrument Functional Test Minimum Frequency (c)	Instrument Calibration Minimum Frequency (d)
1	Off-gas Post Treatment Radiation Monitors	Once/day	Once/month (e) (f)	Every 3 months
2	Refueling Floor Exhaust Vent Radiation Monitors	Once/day	Once/quarter (e) (f)	Every 3 months
3	Reactor Building Exhaust Vent Radiation Monitors	Once/day	Once/quarter (e) (f)	Every 3 months
4	Control Room Intake Radiation Monitors	Once/day	Once/quarter (e) (f)	Every 3 months
5	Main Steam Line Radiation Monitors	None	Once/week (f)	Every 3 months (g)

Notes for Table 4.2-8

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-8 and items in Table 3.2-8.

b. Instrument checks are not required when these instruments are not required to be operable or are tripped. However, if instrument checks are missed, they shall be performed prior to returning the instrument to an operable status.

Notes for Table 4.2-8 (Cont'd)

c. Instrument functional tests are not required when the instruments are not required to be operable or are tripped. However, if instrument functional tests are missed, they shall be performed prior to returning the instrument to an operable status.

d. Instrument calibrations are not required when the instruments are not required to be operable or are tripped. However, if instrument calibrations are missed, they shall be performed prior to returning the instrument to an operable status.

e. Initially once per month or according to figure 4.1-1 with an interval of not less than one month nor more than three months. The compilation of instrument failure rate data may include data obtained from other BWR's for which the same design instrument operates in an environment similar to that of HNP-1. The failure rate date must be reviewed and approved by the AEC prior to any change in the once-a-month frequency.

e. Deleted.

f. This instrumentation is exempted from the instrument functional test definition. This instrument functional test will consist of injecting a simulated electrical signal into the measurement channels.

g. Standard current source used which provides an instrument channel alignment. Calibration using a radiation source shall be made once per operating cycle.

Logic system functional tests and simulated automatic actuation shall be performed once each operating cycle for the following:

1. Secondary Containment Actuation

Table 4.2-9

CHECK AND CALIBRATION MINIMUM FREQUENCY FOR INSTRUMENTATION WHICH INITIATES RECIRCULATION PUMP TRIP

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency	Instrument Calibration Minimum Frequency
1	Reactor Vessel Water Level (ATWS RPT)(b)	Once/shift	~~Once/month~~ quarter	Once/operating cycle
2	Reactor Pressure (ATWS RPT)	Once/shift	~~Once/month~~ quarter	Once/operating cycle
3	EOC - RPT Trip			
	a) Initiating Logic	None	~~Once/month~~ quarter	None
	b) Breakers	None	Once/operating cycle	None
	c) Response Time RPT logic + Breakers(c)	None	None	Once/operating cycle

Notes for Table 4.2-9

(a) The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-9 and items in Table 4.2-9

(b) An ATWS recirculation pump trip logic system functional test shall be performed once per operating cycle.

(c) The EOC-RPT System Response Time shall be the time interval from initial signal generation by the associated turbine stop valve limit switch or from when the turbine control valve hydraulic control oil pressure drops below the pressure switch setpoint to complete suppression of the electric arc between the fully-open contacts of the recirculation pump circuit breaker. The response time may be measured by any series of sequential, overlapping, or total steps such that the entire response time is measured. Each test shall include at least the logic of one type of channel input, turbine control valve fast closure or turbine stop valve closure, such that both types of channel inputs are tested at least once per 36 months. The EOC-RPT System Response Time acceptance criteria associated with turbine stop valve closure shall be ≤ 155 milliseconds; the EOC-RPT System Response Time acceptance criteria associated with the turbine control valve fast closure shall be ≤ 175 milliseconds.

Table 4.2-10

Check, Functional Test, and Calibration Minimum Frequency for Instrumentation Which Monitors Leakage into the Drywell

Ref. No. (a)	Instrument	Instrument Check Minimum Frequency (b)	Instrument Functional Test Minimum Frequency (c)	Instrument Calibration Minimum Frequency (d)
1	Drywell Equipment Drain Sump Flow Integrator	Once/day	(e) Once/month	Every 3 months
2	Drywell Floor Drain Sump Flow Integrator	Once/day	(e) Once/month	Every 3 months
3	Scintillation Detector for Monitoring Air Particulates	Once/day	(e) Once/month	Every 6 months
4	Scintillation Detector for monitoring Radioiodine	Once/day	(e) Once/month	Every 6 months
5	GM Tubes for Monitoring Noble Gases	Once/day	(e) Once/month	Every 6 months

Notes for Table 4.2-10

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 4.2-10 and items in Table 3.2-10.

b. Instrument checks are not required when these instruments are not required to be operable or are tripped. However, if instrument checks are missed, they shall be performed prior to returning the instrument to an operable status.

c. Instrument functional tests are not required when the instruments are not required to be operable or are tripped. However, if instrument functional tests are missed, they shall be performed prior to returning the instrument to an operable status.

Notes for Table 4.2-10 (Cont'd)

d. Instrument calibrations are not required when the instruments are not required to be operable or are tripped. However, if instrument calibrations are missed, they shall be performed prior to returning the instrument to an operable status.

e. Initially once per month or according to Figure 4.1-1 with an interval of not less than one month nor more than three months. The compilation of instrument failure rate data may include data obtained from other BWR's for which the same design instrument operates in an environment similar to that of HNP-1. The failure rate data must be reviewed and approved by the AEC prior to any change in the once-a-month frequency.

e. Deleted.

Table 4.2-14

CHECK, FUNCTIONAL TEST, AND CALIBRATION MINIMUM FREQUENCY FOR INSTRUMENTATION WHICH ARMS THE LOW LOW SET S/RV SYSTEM

Ref. No.[a]	Instrument	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency[b]	Instrument Calibration Minimum Frequency[c]
1	Reactor Vessel Steam Dome Pressure	Once/shift	Once/~~month~~ quarter	Once/operating cycle
2	Relief/Safety Valve Tailpipe Pressure	N/A	Once/~~month~~[d] quarter	Once/operating cycle[e]

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in table 4.2-14 and items in table 4.2-14.

b. Instrument functional tests are not required when the instruments are not required to be operable or are tripped. However, if functional tests are missed, they shall be performed prior to returning the instrument to an operable status.

c. Calibrations are not required when the instruments are not required to be operable. However, if calibrations are missed, they shall be performed prior to returning the instrument to an operable status.

d. See section 4.6.H.1.e.1 for exceptions to this pressure switch functional test frequency.

e. See section 4.6.H.1.e.2.

3.2 PROTECTION INSTRUMENTATION

In addition to the Reactor Protection System (RPS) instrumentation which initiates a reactor scram, protective instrumentation has been provided which initiates action to mitigate the consequences of accidents which are beyond the operators ability to control, or terminates operator errors before they result in serious consequences. This set of Specifications provides the limiting conditions for operation of the instrumentation: (a) which initiates ~~reactor vessel and primary containment~~ isolation, (b) which initiates or controls the core and containment cooling systems, (c) which initiates control rod blocks, (d) which initiates protective action, (e) which monitors leakage into the drywell and (f) which provides surveillance information. The objectives of these specifications are (i) to assure the effectiveness of the protective instrumentation when required by preserving its capability to tolerate a single failure of any component of such systems even during periods when portions of such systems are out of service for maintenance, and (ii) to prescribe the trip settings required to assure adequate performance. When necessary, one channel may be ~~made~~ inoperable for brief intervals to conduct required functional tests and calibrations.

Footnotes are provided in each LCO table (Tables 3.2-1 through 3.2-9) which dictate the allowable time interval. One instrument channel may be considered inoperable for up to 6 hours in order to perform required surveillances for this instrumentation prior to entering other applicable Actions.

removed from service

Isolation Actuation Instrumentation

A. Instrumentation Which Initiates Reactor Vessel & Primary Containment Isolation (Table 3.2-1)

Isolation valves are installed in those lines which penetrate the primary containment and must be isolated during a ~~loss of coolant~~ accident ~~so that the radiation dose limits are not exceeded during an accident condition~~. Actuation of these valves is initiated by ~~protective~~ instrumentation shown in Table 3.2-1 which senses the conditions for which isolation is required. Such instrumentation must be available whenever primary containment integrity is required. The objective is to isolate the primary containment so that the guidelines of 10 CFR 100 are not exceeded during an accident. ~~The events when isolation is required are discussed in Appendix G of the FSAR. The instrumentation which initiates primary system isolation is connected in a dual bus arrangement.~~

1. Reactor Vessel Water Level

a. Reactor Vessel Water Level Low (Level 3) (Narrow Range)

The reactor water level instrumentation is set to trip when reactor water level is approximately 14 feet above the top of the active fuel. This level is referred to as Level 3 in the Technical Specifications and corresponds to a reading of 0.0 inches on the Narrow Range scale. This trip initiates Group 2 and 6 isolation but does not trip the recirculation pumps.

b. Reactor Vessel Water Level Low Low (Level 2)

The reactor water level instrumentation is set to trip when reactor water level is approximately 9 feet above the top of the active fuel. This level is referred to as Level 2 in the Technical Specifications and corresponds to a reading of -47 inches. This trip initiates Group 5 isolation, starts the standby gas treatment system, and initiates secondary containment isolation.

3.2.A.7. Main Steam Line Tunnel Temperature High (Continued)

With the [illegible] int small release of radioactivity, gives isolation before the guidel[illegible] of 10 CFR 100 are exceeded.

8. Reactor Water Cleanup System Differential Flow High

Gross leakage (pipe break) from the reactor water cleanup system is detected by measuring the difference of flow entering and leaving the system. The set point is low enough to ensure prompt isolation of the cleanup system in the event of such a break but, not so low that spurious isolation can occur due to normal system flow fluctuations and instrument noise. Time delay relays are used to prevent the isolation signal which might be generated from the initial flow surge when the cleanup system is started or when operational system adjustments are made which produce short term transients.

9. Reactor Water Cleanup Area Temperature High and

10. Reactor Water Cleanup Area Ventilation Differential Temperature High

Leakage in the high temperature process flow of the reactor water cleanup system external to the primary containment will be detected by temperature sensing elements. Temperature sensors are located in the inlet and outlet ventilation ducts to measure the temperature difference. Local ambient temperature sensors are located in the compartment containing equipment and piping for this system. An alarm in the main control room will be set to annunciate a temperature rise corresponding to a leakage within the identified limit. In addition to annunciation, a high cleanup room temperature will actuate automatic isolation of the cleanup system.

11. Condenser Vacuum Low

The Bases for Condenser Vacuum Low are discussed in the Bases for Specification 2.1.A.7.

Add "Insert D" →

B. Instrumentation Which Initiates or Controls HPCI (Table 3.2-2)

1. Reactor Vessel Water Level Low Low (Level 2)

The reactor vessel water level instrumentation setpoint which initiates HPCI is $\geq$ -47 inches. This level is approximately 9 feet above the top of the active fuel and in the Technical Specifications is referred to as Level 2. The reactor vessel low water level setting for HPCI system initiation is selected high enough above the active fuel to start the HPCI system in time both to prevent excessive fuel clad temperatures and to prevent more than a small fraction of the core from reaching the temperature at which gross fuel failure occurs. The water level setting is far enough below normal levels that spurious HPCI system startups are avoided.

2. Drywell Pressure High

The drywell pressure which initiates HPCI is $\leq$ 2 psig. High drywell pressure could indicate a failure of the nuclear system process barrier. This pressure is selected to be as low as possible without inducing spurious HPCI system startups. This instrumentation serves as a backup to the water level instrumentation described above.

"INSERT D"

12. Drywell Radiation

When drywell radiation reaches the setpoint (≤ 130 R/hr), the purge and vent valves are automatically closed, thus isolating the containment atmosphere from the outside environment.

18 8. MPCI Emergency Area Cooler Ambient Temperature High

High ambient temperature in the MPCI equipment room near the emergency area cooler could indicate a break in the MPCI system turbine steam line. The automatic closure of the MPCI steam line valves prevents the excessive loss of reactor coolant and the release of significant amounts of radioactive material from the nuclear system process barrier. The high temperature setting ≤ 169°F was selected to be far enough above anticipated normal MPCI system operational levels to avoid spurious isolation but low enough to provide timely detection of MPCI turbine steam line break.

14 9. MPCI Steam Supply Pressure Low

Low pressure in the MPCI steam line could indicate a break in the MPCI steam line. Therefore, the MPCI steam line isolation valves are automatically closed. The steam line low pressure function is provided so in the event that a gross rupture of the MPCI steam line occurred upstream from the high flow sensing location, thus negating the high flow indicating function, isolation would be effected on low pressure. The allowable value of ≥ 100 psig is selected at a pressure sufficiently high enough to prevent turbine stall.

15 10. MPCI Steam Line ΔP (Flow) High

MPCI steam line high flow could indicate a break in the MPCI turbine steam line. The automatic closure of the MPCI steam line isolation valves prevents the excessive loss of reactor coolant and the release of significant amount of radioactive materials from the nuclear system process barrier. Upon detection of MPCI steam line high flow the MPCI turbine steam line is isolated. The high steam flow trip setting of 303% flow was selected high enough to avoid spurious isolation, i.e., above the high steam flow rate encountered during turbine starts. The setting was selected low enough to provide timely detection of an MPCI turbine steam line break.

16 11. MPCI Turbine Exhaust Diaphragm Pressure High

High pressure in the MPCI turbine exhaust could indicate that the turbine rotor is not turning, thus allowing reactor pressure to act on the turbine exhaust line. The MPCI steam line isolation valves are automatically closed to prevent overpressurization of the turbine exhaust line. The turbine exhaust diaphragm pressure trip setting of ≤ 20 psig is selected high enough to avoid isolation of the MPCI if the turbine is operating, yet low enough to effect isolation before the turbine exhaust line is unduly pressurized.

HPCI 17 22. Suppression Chamber Area Ambient Temperature High

A temperature of 169°F will initiate a timer to isolate the MPCI turbine steam line.

"INSERT B" (cont.)

3.2.B.15. (HPCI) Suppression Chamber Area Differential Air Temperature High

A differential air temperature greater than the trip setting of ≤ 42°F between the inlet and outlet ducts which ventilate the suppression chamber area will initiate a timer to isolate the HPCI turbine steam line.

19. RCIC Emergency Area Cooler Ambient Temperature High

High ambient temperature in the RCIC equipment room near the emergency area cooler could indicate a break in the RCIC system turbine steam line. The automatic closure of the RCIC steam line valves prevents the excessive loss of reactor coolant and the release of significant amounts of radioactive material from the nuclear system process barrier. The high temperature setting of ≤ 169°F was selected to be far enough above anticipated normal RCIC system operational levels to avoid spurious isolation but low enough to provide timely detection of a RCIC turbine steam line break.

20. RCIC Steam Supply Pressure Low

Low pressure in the RCIC steam supply could indicate a break in the RCIC steam line. Therefore, the RCIC steam supply isolation valves are automatically closed. The steam line low pressure function is provided so that in the event a gross rupture of the RCIC steam line occurred upstream from the high flow sensing location, thus negating the high flow indicating function, isolation would be effected on low pressure. The isolation setpoint of ≥ 60 psig is chosen at a pressure below that at which the RCIC turbine can effectively operate.

21. RCIC Steam Line (ΔP) Flow High

RCIC turbine high steam flow could indicate a break in the RCIC turbine steam line. The automatic closure of the RCIC steam line isolation valves prevents the excessive loss of reactor coolant and the release of significant amounts of radioactive materials from the nuclear system process barrier. Upon detection of RCIC turbine high steam flow the RCIC turbine steam line is isolated. The high steam flow trip setting of 306% flow was selected high enough to avoid spurious isolation, i.e., above the high steam flow rate encountered during turbine starts. The setting was selected low enough to provide timely detection of an RCIC turbine steam line break.

22. RCIC Turbine Exhaust Diaphragm Pressure High

High pressure in the RCIC turbine exhaust could indicate that the turbine rotor is not turning, thus allowing reactor pressure to act on the turbine exhaust line. The RCIC steam line isolation valves are automatically closed to prevent overpressurization of the turbine exhaust line. The turbine exhaust diaphragm pressure trip setting of ≤ 20 psig is selected high enough to avoid isolation of the RCIC if the turbine is operating, yet low enough to effect isolation before the turbine exhaust line is unduly pressurized.

(RCIC) 23. Suppression Chamber Area Ambient Temperature High

As in the RCIC equipment room, and for the same reason, a temperature of ≤ 159°F will initiate a timer to isolate the RCIC turbine steam line.

24. Suppression Chamber Area Differential Air Temperature High

A high differential air temperature between the inlet and outlet ducts which ventilate the suppression chamber area will initate a timer to isolate the RCIC turbine steam line.

3.2.B.3. HPCI Turbine Overspeed

The HPCI turbine is automatically shut down by tripping the HPCI turbine stop valve closed when the 5000 rpm setpoint on the mechanical governor is reached. A turbine overspeed trip is required to protect the physical integrity of the turbine.

4. HPCI Turbine Exhaust Pressure High

When HPCI turbine exhaust pressure reaches the setpoint (≤ 146 psig) the HPCI turbine is automatically shut down by tripping the HPCI stop valve closed. HPCI turbine exhaust high pressure is indicative of a condition which threatens the physical integrity of the exhaust line.

5. HPCI Pump Suction Pressure Low

The pressure switch is used to detect low HPCI system pump suction pressure and is set to trip the HPCI turbine at ≤ 12.6 inches of mercury vacuum. This setpoint is chosen to prevent pump damage by cavitation.

6. Reactor Vessel Water Level High (Level 8)

A reactor water level of +56.5 inches is indicative that the HPCI system has performed satisfactorily in providing makeup water to the reactor vessel. The reactor vessel high water level setting which trips the HPCI turbine is near the top of the steam separators and is sufficient to prevent gross moisture carryover to the HPCI turbine. Two analog differential pressure transmitters trip to initiate a HPCI turbine shutdown.

7. HPCI Pump Discharge Flow High

To prevent damage by overheating at reduced HPCI system pump flow, a pump discharge minimum flow bypass is provided. The bypass is controlled by an automatic, D. C. motor-operated valve. A high flow signal from a flow meter downstream of the pump on the main HPCI line will cause the bypass valve to close. Two signals are required to open the valve: A HPCI pump discharge pressure transmitter high differential pressure signal must be received to act as a permissive to open the bypass valve in the presence of a low flow signal from the differential pressure transmitter.

NOTE:

Because the steam supply line to the HPCI turbine is part of the nuclear system process barrier, the following conditions (B-13) automatically isolate this line, causing shutdown of the HPCI system turbine.

Deleted.

8. ~~HPCI Emergency Area Cooler Ambient Temperature High~~

~~High ambient temperature in the HPCI equipment room near the emergency area cooler could indicate a break in the HPCI system turbine steam line. The automatic closure of the HPCI steam line valves prevents the excessive loss of reactor coolant and the release of significant amounts of radioactive material from the nuclear system process barrier. The high~~

3.2.B.8. Deleted. ~~HPCI Emergency Area Cooler Ambient Temperature High (Continued)~~

~~temperature setting ≤ 169°F was selected to be far enough above anticipated normal HPCI system operational levels to avoid spurious isolation but low enough to provide timely detection of HPCI turbine steam line break.~~

9. Deleted. ~~HPCI Steam Supply Pressure Low~~

~~Low pressure in the HPCI steam line could indicate a break in the HPCI steam line. Therefore, the HPCI steam line isolation valves are automatically closed. The steam line low pressure function is provided so in the event that a gross rupture of the HPCI steam line occurred upstream from the high flow sensing location, thus negating the high flow indicating function, isolation would be effected on low pressure. The allowable value of ≥ 100 psig is selected at a pressure sufficiently high enough to prevent turbine stall.~~

10. Deleted. ~~HPCI Steam Line ΔP (Flow) High~~

~~HPCI steam line high flow could indicate a break in the HPCI turbine steam line. The automatic closure of the HPCI steam line isolation valves prevents the excessive loss of reactor coolant and the release of significant amount of radioactive materials from the nuclear system process barrier. Upon detection of HPCI steam line high flow the HPCI turbine steam line is isolated. The high steam flow trip setting of 303% flow was selected high enough to avoid spurious isolation, i.e., above the high steam flow rate encountered during turbine starts. The setting was selected low enough to provide timely detection of an HPCI turbine steam line break.~~

11. Deleted. ~~HPCI Turbine Exhaust Diaphragm Pressure High~~

~~High pressure in the HPCI turbine exhaust could indicate that the turbine rotor is not turning, thus allowing reactor pressure to act on the turbine exhaust line. The HPCI steam line isolation valves are automatically closed to prevent overpressurization of the turbine exhaust line. The turbine exhaust diaphragm pressure trip setting of ≤ 20 psig is selected high enough to avoid isolation of the HPCI if the turbine is operating, yet low enough to effect isolation before the turbine exhaust line is unduly pressurized.~~

12. Deleted. ~~Suppression Chamber Area Ambient Temperature High~~

~~A temperature of 160°F will initiate a timer to isolate the HPCI turbine steam line.~~

3.2.B.13. ~~Suppression Chamber Area Differential Air Temperature High~~ Deleted.

~~A differential air temperature greater than the trip setting of ≤ 42°F between the inlet and outlet ducts which ventilate the suppression chamber area will initiate a timer to isolate the HPCI turbine steam line.~~

14. Condensate Storage Tank Level Low

The CST is the preferred source of suction for HPCI. In order to provide an adequate water supply, an indication of low level in the CST automatically switches the suction to the suppression chamber. A trip setting of 0 inches corresponds to 10,000 gallons of water remaining in the tank.

15. Suppression Chamber Water Level High

A high water level in the suppression chamber automatically switches HPCI suction to the suppression chamber from the CST.

16. HPCI Logic Power Failure Monitor

The HPCI Logic Power Failure Monitor monitors the availability of power to the logic system. In the event of loss of availability of power to the logic system, an alarm is annunciated in the control room.

C. Instrumentation Which Initiates or Controls RCIC (Table 3.2-3)

1. Reactor Vessel Water Level Low Low (Level 2)

The reactor vessel water level instrumentation setpoint which initiates RCIC is ≥ -47 inches. This level is approximately 9 feet above the top of the active fuel and is referred to as Level 2. This setpoint insures that RCIC is started in time to preclude conditions which lead to inadequate core cooling.

2. RCIC Turbine Overspeed

The RCIC turbine is automatically shutdown by tripping the RCIC turbine stop valve closed when the 125% speed at rated flow setpoint on the mechanical governor is reached. Turbine overspeed is indicative of a condition which threatens the physical integrity of the system. An electrical tachometer trip setpoint of 110% also will trip the RCIC turbine stop valve closed.

3. RCIC Turbine Exhaust Pressure High

When RCIC turbine exhaust pressure reaches the setpoint (≤ 45 psig), the RCIC turbine is automatically shut down by tripping the RCIC turbine stop valve closed. RCIC turbine exhaust high pressure is indicative of a condition which threatens the physical integrity of the exhaust line.

4. RCIC Pump Suction Pressure Low

One differential pressure transmitter is used to detect low RCIC system pump suction pressure and is set to trip the RCIC turbine at ≤ 12.6 inches of mercury vacuum.

3.2.C.5. Reactor Vessel Water Level High (Level 8)

A high reactor water level trip is indicative that the RCIC system has performed satisfactorily in providing makeup water to the reactor vessel. The reactor vessel high water level setting which trips the RCIC turbine is near the top of the steam separators and sufficiently low to prevent gross moisture carryover to the RCIC turbine. Two differential pressure transmitters trip to initiate a RCIC turbine shutdown. Once tripped the system is capable of automatic reset after the water level drops below Level 8. This automatic reset eliminates the need for manual reset of the system before the operator can take manual control to avoid fluctuating water levels.

6. RCIC Pump Discharge Flow

To prevent damage by overheating at reduced RCIC system pump flow, a pump discharge minimum flow bypass is provided. The bypass is controlled by an automatic, D. C. motor-operated valve. A high flow signal from a flow meter downstream of the pump on the main RCIC line will cause the bypass valve to close. Two signals are required to open the valve: A RCIC pump discharge pressure transmitter high differential pressure signal must be received to act as a permissive to open the bypass valve in the presence of a low flow signal from the differential pressure transmitter.

Note:

Because the steam supply line to the RCIC turbine is part of the nuclear system process barrier, the following conditions (7 - 13) automatically isolate this line, causing shutdown of the RCIC system turbine.

Deleted.

7. ~~RCIC Emergency Area Cooler Ambient Temperature High~~

~~High ambient temperature in the RCIC equipment room near the emergency area cooler could indicate a break in the RCIC system turbine steam line. The automatic closure of the RCIC steam line valves prevents the excessive loss of reactor coolant and the release of significant amounts of radioactive material from the nuclear system process barrier. The high temperature setting of $\leq$ 169°F was selected to be far enough above anticipated normal RCIC system operational levels to avoid spurious isolation but low enough to provide timely detection of a RCIC turbine steam line break.~~

Deleted.

8. ~~RCIC Steam Supply Pressure Low~~

~~Low pressure in the RCIC steam supply could indicate a break in the RCIC steam line. Therefore, the RCIC steam supply isolation valves are automatically closed. The steam line low pressure function is provided so that in the event a gross rupture of the RCIC steam line occurred upstream from the high flow sensing location, thus negating the high flow indicating function, isolation would be effected on low pressure. The isolation setpoint of $\geq$ 60 psig is chosen at a pressure below that at which the RCIC turbine can effectively operate.~~

3.2.C.9. ~~RCIC Steam Line (ΔP) Flow High~~ Deleted.

~~RCIC turbine high steam flow could indicate a break in the RCIC turbine steam line. The automatic closure of the RCIC steam line isolation valves prevents the excessive loss of reactor coolant and the release of significant amounts of radioactive materials from the nuclear system process barrier. Upon detection of RCIC turbine high steam flow the RCIC turbine steam line is isolated. The high steam flow trip setting of 306% flow was selected high enough to avoid spurious isolation, i.e., above the high steam flow rate encountered during turbine starts. The setting was selected low enough to provide timely detection of an RCIC turbine steam line break.~~

10. ~~RCIC Turbine Exhaust Diaphragm Pressure High~~ Deleted.

~~High pressure in the RCIC turbine exhaust could indicate that the turbine rotor is not turning, thus allowing reactor pressure to act on the turbine exhaust line. The RCIC steam line isolation valves are automatically closed to prevent overpressurization of the turbine exhaust line. The turbine exhaust diaphragm pressure trip setting of ≤ 20 psig is selected high enough to avoid isolation of the RCIC if the turbine is operating, yet low enough to effect isolation before the turbine exhaust line is unduly pressurized.~~

11. ~~Suppression Chamber Area Ambient Temperature High~~ Deleted.

~~As in the RCIC equipment room, and for the same reason, a temperature of ≤ 169°F will initiate a timer to isolate the RCIC turbine steam line.~~

12. ~~Suppression Chamber Area Differential Air Temperature High~~ Deleted.

~~A high differential air temperature between the inlet and outlet ducts which ventilate the suppression chamber area will initiate a timer to isolate the RCIC turbine steam line.~~

13. RCIC Logic Power Failure Monitor

The RCIC Logic Power Failure Monitor monitors the availability of power to the logic system. In the event of loss of availability of power to the logic system, an alarm is annunciated in the control room.

14. Condensate Storage Tank Level Low

The low CST level signal transfers RCIC suction from the CST to the suppression pool. The setpoint was chosen to ensure an uninterrupted supply of water during suction transfer.

15. Suppression Pool Water Level High

A high water level in the suppression chamber automatically switches RCIC suction from the CST to the suppression pool.

2. Drywell Pressure High

Primary containment high pressure could indicate a break in the nuclear system process barrier inside the drywell. The high drywell pressure setpoint is selected to be high enough to avoid spurious starts but low enough to allow timely system initiation.

3. Reactor Vessel Steam Dome Pressure Low

~~The Bases for Reactor Pressure (Shutdown Cooling Mode) are discussed in the Bases for Specification 3.2.A.2.~~

With an analytical limit of $\geq$ 300 psig and a nominal trip setpoint of 370 psig, the recirculation discharge valve will close successfully during a LOCA condition.

Once the LPCI system is initiated, a reactor low pressure setpoint of 460 psig produces a signal which is used as a permissive to open the LPCI injection valves. The valves do not open, however, until reactor pressure falls below the discharge head of LPCI.

4.2 PROTECTIVE INSTRUMENTATION

ADD "INSERT E"

The instrumentation listed in Tables 4.2-1 thru 4.2-13 will be functionally tested and calibrated at regularly scheduled intervals. ~~The same design reliability goal as the Reactor Protection System of 0.99999 is generally applied~~ for all applications of one-out-of-two-taken-twice logic. Therefore, on-off sensors are tested once every three months, and bi-stable trips associated with analog sensors and amplifiers are tested once per week. The ATTS instruments are tested once per month per NEDO-21617-A.

Those instruments which, when tripped, result in a rod block have their contacts arranged in a one-out-of-n logic, and all are capable of being bypassed. For such a tripping arrangement with bypass capability provided, there is an optimum test interval that should be maintained in order to maximize the reliability of a given channel (Reference 1). This takes account of the fact that testing degrades reliability and the optimum interval between tests is approximately given by:

$$i = \sqrt{\frac{2t}{r}}$$

Where: i = the optimum interval between tests.

t = the time the trip contacts are disabled from performing their function while the test is in progress.

r = the expected failure rate of the relays.

To test the trip relays requires that the channel be bypassed, the test made, and the system returned to its initial state. It is assumed this task requires an estimated 30 minutes to complete in a thorough and workmanlike manner and that the relays have a failure rate of 10^{-6} failures per hour. Using this data and the above operation, the optimum test interval is:

$$i = \sqrt{\frac{2(0.5)}{10^{-6}}} = 10^{3} \text{ hours}$$

$$\approx 42 \text{ days}$$

A test interval of once-per-month will be used initially.

The sensors and electronic apparatus have not been included here as these are analog devices with readouts in the control room and the sensors and electronic apparatus can be checked by comparison with other like instruments. The checks which are made on a daily or once per shift basis are adequate to assure operability of the sensors and electronic apparatus, and the test interval given above provides for optimum testing of the relay circuits.

The above calculated test interval optimizes each individual channel, considering it to be independent of all others. As an example, assume that there are two channels with an individual technician assigned to each. Each technician tests his channel at the optimum frequency, but the two technicians are not allowed to communicate so that one can advise the other that his channel is under test. Under these conditions, it is possible for both channels to be under test simultaneously. ~~Now, assume that the technicians are required to communicate and that two~~

Insert E (to P. 3.2-69)

The minimum functional test frequencies and allowable outage times for selected instrumentation related to isolation actuation, ECCS and RCIC actuation, and control rod block have been revised.

The NRC-approved reliability-based methodology in References 1 through 4 provides a basis for these changes and is consistent with similar changes to RPS instrumentation. The frequency of functional testing and calibration for other instrumentation is based on historical methodology (Reference 5).

A. References

1. NEDC-30851P-A, "BWR Owners' Group Technical Specification Improvement Analysis for BWR Reactor Protection System," March 1988.

2. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.

3. NEDC-30936P-A, "BWR Owners' Group Technical Specification Improvement Methodology (with Demonstration for BWR ECCS Actuation Instrumentation) Part 2," June 1987.

4. NEDC-30851P-A, Supplement 1, "Technical Specification Improvement Analysis for BWR Control Rod Block Instrumentation," October 1988.

5. UCRL-50451, "Improving Availability and Readiness of Field Equipment Through Periodic Inspection," Benjamin Epstein, Albert Shiff, July 16, 1968, page 10, Equation (24), Lawerence Radiation Laboratory.

(Delete)

4.2 PROTECTIVE INSTRUMENTATION (Continued)

channels are never tested at the same time.

Forbidding simultaneous testing improves the availability of the system over that which would be achieved by testing each channel independently. These one out of n trip systems will be tested one at a time in order to take advantage of this inherent improvement in availability.

Optimizing each channel independently may not truly optimize the system considering the overall rules of system operation. However, true system optimization is a complex problem. The optimums are broad, not sharp, and optimizing the individual channels is generally adequate for the system.

The formula given above minimizes the unavailability of a single channel which must be bypassed during testing. The minimization of the unavailability is illustrated by Curve No. 1 of Figure 4.2-1 which assumes that a channel has a failure rate of 0.1×10^{-4}/hour and that 0.5 hours is required to test it. The unavailability is a minimum at a test interval i, of 3.16×10^{2} hours.

If two similar channels are used in one-out-of-two configuration, test interval for minimum unavailability changes as a function of the rules for testing. The simplest case is to test each one independent of the other. In this case, there is assumed to be a finite probability that both may be bypassed at one time. This case is shown by Curve No. 2. Note that the unavailability is lower as expected for a redundant system and the minimum occurs at the same test interval. Thus, if the two channels are tested independently, the equation on the preceding page yields the test interval for minimum unavailability.

A more usual case is that the testing is not done independently. If both channels are bypassed and tested at the same time, the result is shown in Curve No. 3. Note that the minimum occurs at about 40,000 hours, much longer than for Cases 1 and 2. Also, the minimum is not nearly as low as Case 2 which indicates that this method of testing does not take full advantage of the redundant channel. Bypassing both channels for simultaneous testing should be avoided.

The most likely case would be to stipulate that one channel by bypassed, tested, and restored, and then immediately following, the second channel be bypassed, tested, and restored. This is shown by Curve No. 4. Note that there is no true minimum. The curve does have a definite knee and very little reduction in system unavailability is achieved by testing at a shorter interval than computed by the equation for a single channel.

The best test procedure of all those examined is to perfectly stagger the tests. That is, if the test interval is four months, test one or the other channel every two months. This is shown in Curve No. 5. The difference between Cases 4 and 5 is negligible. There may be other arguments, however, that more strongly support the perfectly staggered tests, including reductions in human error.

The conclusions to be drawn are these:

i. A one-out-of-n system may be treated the same as a single channel in terms of choosing a test interval; and

ii. More than one channel should not be bypassed for testing at any one time.

(Delete)

4.2 PROTECTIVE INSTRUMENTATION (Continued)

The radiation monitors in the refueling floor exhaust ventilation duct which initiate building isolation and standby gas treatment operation are arranged in two one-out-of-two logic systems. The bases given for the rod blocks apply here also and were used to arrive at the functional testing frequency. The offgas post treatment monitors are connected in a two-out-of-two logic arrangement. Based on experience with instruments of similar design, a testing interval of once every three months has been found adequate.

The automatic pressure relief instrumentation can be considered to be a one-out-of-two logic system and the discussion above applies also.

A. References

1. UCRL-50451, Improving Availability and Readiness of Field Equipment Through Periodic Inspection, Benjamin Epstein, Albert Shiff, July 16, 1968, page 10, Equation (24), Lawerence Radiation Laboratory.

(Delete)

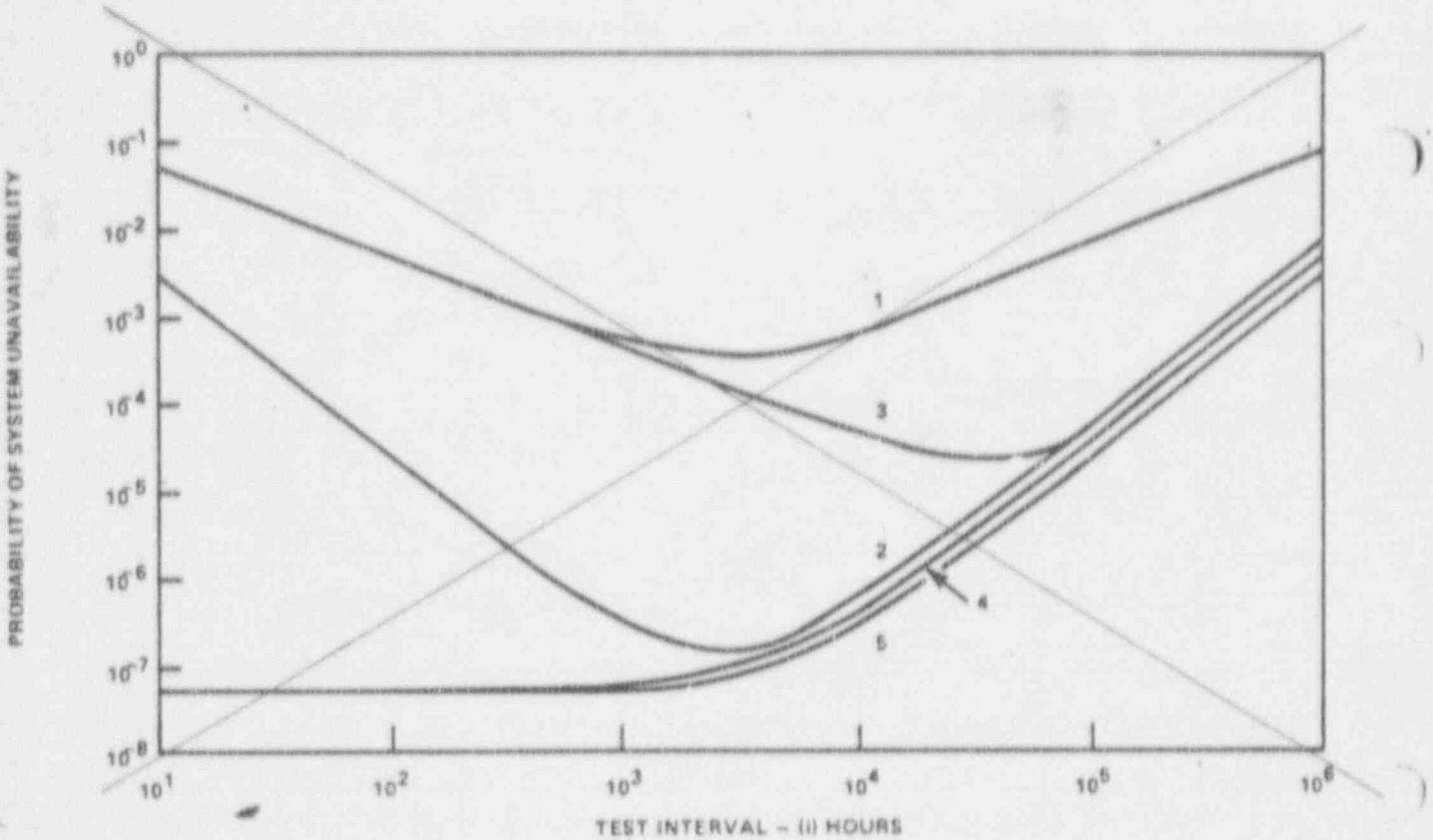

FIGURE 4.2-1. SYSTEM UNAVAILABILITY

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.5.H. Maintenance of Filled Discharge Pipes	4.5.H. Maintenance of Filled Discharge Pipes
Whenever the CS system, LPCI, HPCI, or RCIC are required to be operable, the discharge piping from the pump discharge of these systems to the last block valve shall be filled. The suction of the HPCI pumps shall be aligned to the condensate storage tank.	The following surveillance requirements shall be performed to assure that the discharge piping of the CS system, LPCI, HPCI, and RCIC are filled when required:
	1. Every month, the discharge piping of the LPCI and CS systems shall be vented from the high point and water flow observed.
	2. Following any period where the LPCI or CS systems have not been required to be operable, or have been inoperable, the discharge piping of the system or systems being returned to service shall be vented from the high point prior to return of the system to service.
	3. Whenever the HPCI or RCIC system is lined up to take suction from the condensate storage tank, the discharge piping of the HPCI and RCIC shall be vented from the high point of the system and water flow observed on a monthly basis.
	4. The level switches which monitor the discharge lines shall be ~~functionally tested every month and~~ calibrated every 3 months.
1. Minimum River Level	1. Minimum River Level
1. If the water level, as measured in the pump well, is less than 61.2 ft MSL, the discharge from each plant service water (PSW) pump will be throttled such that each pump does not exceed 7000 gpm.	The water level as, measured in the pump well, and the level in the river* shall be verified with the following frequencies:
2. If the water level, as measured in the pump well, decreases to less than 60.7 ft MSL, or if the level in the river* drops to a level equivalent to less	Level (MSL) — Frequency 1. > 61.7 ft — Biweekly. 2. ≤ 61.7 ft — Every 12 hrs.

*Only pump well monitoring is required if a temporary weir is not in place.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.6.H.1. Relief/Safety Valves	4.6.H.1. Relief/Safety Valves
a. When one or more relief/safety valve(s) is known to be failed*** an orderly shutdown shall be initiated and the reactor depressurized to less than 113 psig within 24 hours. Prior to reactor startup from a cold condition all relief/safety valves shall be operable.**	a. End of Operating Cycle Approximately one-half of all relief/safety valves shall be benchchecked or replaced with a benchchecked valve each refueling outage. All 11 valves will have been checked or replaced upon the completion of every second operating cycle.
b. With one or more relief/safety valve(s) stuck open, place the reactor mode switch in the shutdown position.	b. Each Operating Cycle Once during each operating cycle, at a reactor pressure > 100 psig each relief valve shall be manually opened until thermocouples downstream of the valve indicate steam is flowing from the valve.
c. With one or more safety/relief valve tailpipe pressure switches of a safety/relief valve declared inoperable and the associated safety/relief valve(s) otherwise indicated to be open, place the reactor mode switch in the Shutdown position.	c. Integrity of Relief Valve Bellows* The integrity of the relief valve bellows shall be continuously monitored and the pressure switch calibrated once per operating cycle and the accumulators and air piping shall be inspected for leakage once per operating cycle.
d. With one safety/relief valve tailpipe pressure switch of a safety/relief valve declared inoperable and the associated safety/relief valve(s) otherwise indicated to be closed, plant operation may continue. Remove the function of that pressure switch from the low low set logic circuitry until the next COLD SHUTDOWN. Upon COLD SHUTDOWN, restore the pressure switch(es) to OPERABLE status before STARTUP.	d. Relief Valve Maintenance At least one relief valve shall be disassembled and inspected each operating cycle.
e. With both safety/relief valve tailpipe pressure switches of a safety/relief valve declared inoperable and the associated safety/relief valve(s) otherwise indicated to be closed, restore at least one inoperable switch to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.	e. Operability of Tailpipe Pressure Switches The tailpipe pressure switch of each relief/safety valve shall be demonstrated operable**** by performance of a: 1. Functional Test: a. At least once per ~~31~~ 92 days, except that all portions of instrumentation inside the primary containment may be excluded from the functional test, and

*Does not apply to two-stage Target Rock SRVs

Relief

**The ~~Relief~~/Safety valves are not required to be operable for performance of inservice hydrostatic or pressure testing with reactor pressure greater than 113 psig and all control rods inserted. Overpressure protection will be provided as required by ASME Code.

***The failure or malfunction of any safety/relief valve shall be reported by telephone within 24 hours; confirmed by telegraph, mailgram, or facsimile transmission to the Director of the Regional Office or his designee no later than the first working day following the event; and a written followup report within 30 days. The written followup report should be completed in accordance with 10 CFR 50.73 or other applicable requirements.

**** One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable Actions.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS

4.6.H.1. Relief/Safety Valves (Continued)

e. Operability of Tail Pipe Pressure Switches

1. Functional Test:

b. At each scheduled outage greater than 72 hours during which entry is made into the primary containment, if not performed within the previous ~~31~~ 92 days.

2. Calibration and verifying the setpoint to be 85, +15, -5 psig at least once per 18 months.

3.6.H.2. Relief/Safety Valves Low Low Set Function

During power operation startup, and hot standby, the relief valve function and the low low set function of the following reactor coolant system safety/relief valves shall be OPERABLE with the following low low set function lift settings:

Low Low Set Valve Function	Allowable Value (psig)* Open	Close
Low	≤ 1005	≤ 857
Medium	≤ 1020	≤ 872
Medium High	≤ 1035	≤ 887
High	≤ 1045	≤ 897

a. With the relief valve function and/or the low low set function of one of the above required reactor coolant system safety/relief valves inoperable, restore the relief valve function and the low low set function to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and COLD SHUTDOWN within the following 24 hours.

4.6.H.2. Relief/Safety Valves Low Low Set Function

The low low set relief valve function and the low low set function pressure actuation instrumentation shall be demonstrated OPERABLE*** by performance of a:

a. CHANNEL FUNCTIONAL TEST, including calibration of the trip unit and the dedicated high steam dome pressure channels**, at least once per ~~month~~ quarter

b. CHANNEL CALIBRATION, Logic System Function Test, and simulated automatic operation of the entire system at least once per 18 months.

* The lift setting pressure shall correspond to ambient conditions of the valves at nominal operating temperatures and pressures.

**The setpoint for dedicated high steam dome pressure channels is ≤ 1054 psig.

*** One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable Actions.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
	4.9.A.6. Emergency 250 Volt DC to 600 Volt AC Inverters (Continued)
	b. Once every scheduled refueling outage, the emergency 250 volt DC/600 volt AC inverters shall be subjected to a load test to demonstrate operational readiness.
3.9.A.7. Logic Systems	4.9.A.7. Logic Systems
The following logic systems shall be operable:	The logic systems shall be tested in the manner and frequency as follows:
a. The common accident signal logic system is operable.	a. Each division of the common accident signal logic system shall be tested every scheduled refueling outage to demonstrate that it will function on actuation of the core spray system to provide an automatic start signal to all 3 diesel generators.
b. The undervoltage relays and supporting system are operable.	b.1. Once every scheduled refueling outage, the conditions under which the undervoltage logic system is required shall be simulated with an undervoltage on each start bus to demonstrate that the diesel generators will start. The testing of the undervoltage logic shall demonstrate the operability of the 4160 volt load shedding and auto bus transfer circuits. The simulations shall test both the degraded voltage and the loss of off-site power relays. Deleted.
	2. Once per month, the relays which initiate energization of the emergency buses by the Diesel Generators when voltage is lost on the emergency buses and start-up transformer 1C, will be functionally tested.
c. The common accident signal logic system, and undervoltage relays and supporting system are operable.	c.1. Once per operating cycle each diesel generator shall be demonstrated operable by simulating both a loss of off-site power and a degraded voltage condition in conjunction with an accident test signal and verifying:

INSTRUMENTATION

RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.14.1 The radioactive liquid effluent monitoring instrumentation channels shown in table 3.14.1-1 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.15.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined in accordance with the OFFSITE DOSE CALCULATION MANUAL (ODCM).

APPLICABILITY

As shown in table 3.14.1-1.

ACTION

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

b. With the number of channels OPERABLE* less than the minimum channels required by table 3.14.1-1, take the ACTION shown in table 3.14.1-1.

c. The provisions of Specification 6.9.1.13(b) are not applicable.

d. When the ACTION statement or other requirements of this LCO cannot be met, steps need not be taken to change the Operational Mode of the Unit. Entry into an Operational Mode or other specified condition may be made if, as a minimum, the requirements of the ACTION statement are satisfied.

SURVEILLANCE REQUIREMENTS

4.14.1 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST operations at the frequencies shown in table 4.14.1-1.

*One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable Actions.

TABLE 3.14.2-1 (SHEET 3 OF 4)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Table Notations

+Monitor must be capable of responding to a Lower Limit of Detection of 1×10^{-4} µCi/ml.

*During releases via this pathway.

**During main condenser offgas treatment system operation.

***During operation of the main condenser air ejector.

ACTION 104 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue, provided the flowrate is estimated at least once per 4 hours.

If the number of channels OPERABLE remains less than required by the Minimum Channels OPERABLE requirement for over 30 days, an explanation of the circumstances shall be included in the next semi-annual effluent release report.

Add "Insert F" (See Bottom of Next Page)

ACTION 105 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue, provided grab samples are taken daily and analyzed daily for gross activity within 24 hours. With the number of main stack monitoring system channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, without delay suspend drywell purge.

If the number of channels OPERABLE remains less than required by the Minimum Channels OPERABLE requirement for over 30 days, an explanation of the circumstances shall be included in the next semi-annual effluent release report.

Add "Insert F"

ACTION 106 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, operation of the main condenser offgas treatment system may continue provided:

(a) Gas samples are collected once per 4 hours and analyzed within the ensuing 4 hours, or

(b) Using a temporary hydrogen analyzer installed in the offgas system line downstream of the recombiner, hydrogen concentration readings are taken and logged every 4 hours.

TABLE 3.14.2-1 (SHEET 4 OF 4)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Table Notations (Continued)

If the number of channels OPERABLE remains less than required by the Minimum Channels OPERABLE requirement for over 30 days, an explanation of the circumstances shall be included in the next semi-annual effluent release report.

Add "Insert F" →

ACTION 107 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue, provided samples are continuously collected with auxiliary sampling equipment for periods on the order of 7 days and analyzed within 48 hours after the end of the sampling period.

If the number of channels OPERABLE remains less than required by the Minimum Channels OPERABLE requirement for over 30 days, an explanation of the circumstances shall be included in the next semi-annual effluent release report.

Add Insert F" →

ACTION 108 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, release to the environment may continue for up to 72 hours provided:

a. The offgas system is not bypassed, and

b. The offgas post-treatment monitor (D11-K615) or the main stack monitor (D11-K600) is OPERABLE.

Otherwise, be in at least HOT STANDBY within 12 hours.

If the number of channels OPERABLE remains less than required by the Minimum Channels OPERABLE requirement for over 30 days, an explanation of the circumstances shall be included in the next semi-annual effluent release report.

Add "Insert F' →

Insert F: One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable Actions.

CONTROL ROD SCRAM ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.1.3.5 All control rod scram accumulators shall be OPERABLE.

APPLICABILITY: CONDITIONS 1, 2 and 5*.

ACTION:

a. In CONDITION 1 or 2 with one control rod scram accumulator inoperable, the provisions of Specification 3.0.4 are not applicable and operation may continue, provided that within 8 hours:

1. The inoperable accumulator is restored to OPERABLE status, or

2. The control rod associated with the inoperable accumulator is declared inoperable and the requirements of Specification 3.1.3.1 are satisfied.

Otherwise, be in at least HOT SHUTDOWN within the next 12 hours.

b. In CONDITION 5* with a withdrawn control rod scram accumulator inoperable, fully insert the affected control rod and electrically disarm the directional control valves or close the withdraw isolation valve within one hour. The provisions of Specification 3.0.3 are not applicable.

c. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.1.3.5 The control rod scram accumulators shall be determined OPERABLE:

a. At least once per 7 days by verifying that the pressure and leak detectors are not in the alarmed condition, and

b. At least once per 18 months by performance of a:

1. CHANNEL FUNCTIONAL TEST of the leak detectors, and

2. CHANNEL CALIBRATION of the pressure detectors to alarm at ≥ 940 psig.

*At least the accumulator associated with each withdrawn control rod. Not applicable to control rods removed per Specification 3.9.11.1 or 3.9.11.2.

ROD BLOCK MONITOR

LIMITING CONDITION FOR OPERATION

3.1.4.3 Both Rod Block Monitor (RBM) channels shall be OPERABLE.

APPLICABILITY: CONDITION 1, when THERMAL POWER is greater than or equal to 30% of RATED THERMAL POWER and when the MCPR is less than the value provided in the CORE OPERATING LIMITS REPORT.

ACTION:

a. With one RBM channel inoperable, POWER OPERATION may continue provided that the inoperable RBM channel is restored to OPERABLE status within 24 hours; otherwise, trip at least one rod block monitor channel within the next hour.

b. With both RBM channels inoperable, trip at least one rod block monitor channel within one hour.

a. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.1.4.3 a. With both RBM channels OPERABLE, surveillance requirements are given in Specification 4.3.5.

b. With one RBM channel INOPERABLE, the other channel shall be demonstrated OPERABLE by performance of a CHANNEL FUNCTIONAL TEST prior to withdrawal of control rods.

c. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS, provided at least one OPERABLE channel in the same trip system is monitoring that parameter.

3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the reactor protection system instrumentation channels shown in Table 3.3.1-1 shall be OPERABLE with the REACTOR PROTECTION SYSTEM RESPONSE TIME as shown in Table 3.3.1-2. Set points and interlocks are given in Table 2.2.1-1.

APPLICABILITY: As shown in Table 3.3.1-1.

ACTION:

a. With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place at least one inoperable channel in the tripped condition within 12 hours.

b. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, place at least one inoperable channel in at least one trip system* in the tripped condition within 1 hour and take the ACTION required by Table 3.3.1-1.

d.c. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.1.1 Each reactor protection system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.1-1.

AL

4.3.1.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

4.3.1.3 The REACTOR PROTECTION SYSTEM RESPONSE TIME of each reactor trip function of Table 3.3.1-2 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 ~~were~~ where N is the total number of redundant channels in a specific reactor trip function.

*If both channels are inoperable in one trip system, select at least one inoperable channel in that trip system to place in the tripped condition, except when this could cause the Trip Function to occur.

TABLE 3.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION

ACTION 9 - In OPERATIONAL CONDITION 1 or 2, be in at least HOT SHUTDOWN within 6 hours.

In OPERATIONAL CONDITION 3 or 4, lock the reactor mode switch in the Shutdown position within 1 hour.

In OPERATIONAL CONDITION 5, suspend all operations involving CORE ALTERATIONS or positive reactivity changes and fully insert all insertable control rods within 1 hour.

TABLE NOTATIONS

Deleted.

a. ~~A 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.~~

b. The "shorting links" shall be removed from the RPS circuitry during CORE ALTERATIONS and shutdown margin demonstrations performed in accordance with Specification 3.10.3.

c. The IRM scrams are automatically bypassed when the reactor vessel mode switch is in the Run position and all APRM channels are OPERABLE and on scale.

d. An APRM channel is inoperable if there are less than 2 LPRM inputs per level or less than 11 LPRM inputs to an APRM channel.

e. These functions are not required to be OPERABLE when the reactor pressure vessel head is unbolted or removed.

f. This function is automatically bypassed when the reactor mode switch is in other than the Run position.

g. This function is not required to be OPERABLE when PRIMARY CONTAINMENT INTEGRITY is not required.

h. With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.11.1 or 3.9.11.2.

i. These functions are bypassed when turbine first stage pressure is ≤250* psig, equivalent to THERMAL POWER less than 30% of RATED THERMAL POWER.

j. Within 24 hours prior to the planned start of the hydrogen injection test 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 test. The background radiation level and associated trip setpoints may be adjusted during the test 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 establishing reactor power levels below 20% rated power.

*Initial setpoint. Final setpoint to be determined during startup testing.

INSTRUMENTATION

3/4.3.2 ISOLATION ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.2 The isolation actuation instrumentation channels shown in Table 3.3.2-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.2-2 and with ISOLATION SYSTEM RESPONSE TIME as shown in Table 3.3.2-3.

APPLICABILITY: As shown in Table 3.3.2-1.

ACTION:

a. With an isolation actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.2-2, declare the channel inoperable and place the inoperable channel in the tripped condition* until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

Delete; add "Insert A"

b. With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place at least one inoperable channel in the tripped condition* within one hour.

c. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, place at least one inoperable channel in at least one trip system** in the tripped condition within one hour and take the ACTION required by Table 3.3.2-1.

d. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

e. d. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.2.1 Each isolation actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST AND CHANNEL CALIBRATION operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.2-1.

* With a design providing only one channel per trip system, an inoperable channel need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, the inoperable channel shall be restored to OPERABLE status within 2 hours or the ACTION required by Table 3.3.2-1 for that Trip Function shall be taken.

**If both channels are inoperable in one trip system, select at least one inoperable channel in that trip system to place in the tripped condition, except when that would cause the Trip Function to occur.

Insert A (to p. 3/4 3-9)

With the number of OPERABLE channels less than required by the minimum OPERABLE channels per trip system requirement for one trip system, either:

1. Place the inoperable channel(s) in the tripped condition* within 12 hours

   OR

2. Take the ACTION required by Table 3.3.2-1.

The provisions of Specification 3.0.4 are not applicable.

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

ACTION

ACTION 20 - Be in at least HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within the next 30 hours.

ACTION 21 - Be in at least STARTUP with the main steam line isolation valves closed within 2 hours or be in at least HOT SHUTDOWN within 6 hours and in COLD SHUTDOWN within the next 30 hours.

ACTION 22 - Be in at least STARTUP within 2 hours

ACTION 23 - Be in at least STARTUP with the Group 1 isolation valves closed within 2 hours or in at least HOT SHUTDOWN within 6 hours.

ACTION 24 - Establish SECONDARY CONTAINMENT INTEGRITY with the standby gas treatment system operating within one hour.

ACTION 25 - Isolate the reactor water cleanup system.

ACTION 26 - Close the affected system isolation valves and declare the affected system inoperable.

ACTION 27 - Verify power availability to the bus at least once per 12 hours or close the affected system isolation valves and declare the affected system inoperable.

ACTION 28 - Close the shutdown cooling supply and reactor vessel head spray isolation valves unless reactor steam dome pressure ≤ 145 psig.

ACTION 29 - Either close the affected isolation valves within 24 hours or be in HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the next 30 hours.

NOTES

Actuates the standby gas treatment system.

** When handling irradiated fuel in the secondary containment.

*** When performing inservice hydrostatic or leak testing with the reactor coolant temperature above 212° F.

a. See Specification 3.6.3, Table 3.6.3-1 for valves in each valve group.

Deleted.

b. A channel may be placed in inoperable status for up to 2 hours for required surveillance without placing the trip system in the tripped condition provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.

c. With a design providing only one channel per trip system, an inoperable channel need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, the inoperable channel shall be restored to OPERABLE status within 2 hours or the ACTION required by Table 3.3.2-1 for that Trip Function shall be taken.

d. Trips the mechanical vacuum pumps.

e. A channel is OPERABLE if 2 of 4 instruments in that channel are OPERABLE.

f. May be bypassed with all turbine stop valves closed.

g. Closes only RWCU outlet isolation valve 2G31-F004.

h. Alarm only.

i. Adjustable up to 50 minutes.

j. Isolates containment purge and vent valves.

k. Within 24 hours prior to the planned start of the hydrogen injection test 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 test. The background radiation level and associated trip setpoints may be adjusted during the test 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 establishing reactor power levels below 20% rated power.

TABLE 4.3.2-1

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. PRIMARY CONTAINMENT ISOLATION				
a. Reactor Vessel Water Level				
1. Low (Level 3)	S	~~M~~ Q	R	1, 2, 3
2. Low Low (Level 2)	S	~~M~~ Q	R	1, 2, 3
3. Low Low Low (Level 1)	S	~~M~~ Q	R	1, 2, 3
b. Drywell Pressure - High	S	~~M~~ Q	R	1, 2, 3
c. Main Steam Line				
1. Radiation - High	~~D~~ S	W(a)	R	1, 2, 3
2. Pressure - Low	A	~~M~~ NA	Q	1
3. Flow - High	S	~~M~~ Q	R	1, 2, 3
d. Main Steam Line Tunnel Temperature - High	S	~~M~~ Q	R	1, 2, 3
e. Condenser Vacuum - Low	NA	~~M~~ NA	Q	1, 2#, 3#
f. Turbine Building Area Temp. - High	NA	~~M~~ Q	R	1, 2, 3
g. Drywell Radiation - High	~~D~~ S	~~M~~ Q	R	1, 2, 3
2. SECONDARY CONTAINMENT ISOLATION				
a. Reactor Building Exhaust Radiation - High	~~D~~ S	~~M~~ Q(a)	R	1, 2, 3, 5 and *
b. Drywell Pressure - High	S	~~M~~ Q	R	1, 2, 3
c. Reactor Vessel Water Level - Low Low (Level 2)	S	~~M~~ Q	R	1, 2, 3
d. Refueling Floor Exhaust Radiation - High	~~D~~ S	~~M~~ NA	Q	1, 2, 3, 5 and *

*When handling irradiated fuel in the secondary containment.
#May be bypassed with all turbine stop valves closed.
(a)Instrument alignment using a standard current source.

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
3. REACTOR WATER CLEANUP SYSTEM ISOLATION				
a. Δ Flow - High	~~D~~	~~M~~ Q	R	1, 2, 3
b. Area Temperature - High	S	~~M~~ Q	R	1, 2, 3
c. Area Ventilation Δ Temperature - High	S	~~M~~ Q	R	1, 2, 3
d. SLCS Initiation	NA	R	NA	1, 2, 3
e. Reactor Vessel Water Level - Low Low (Level 2)	S	~~M~~ Q	R	1, 2, 3
4. HIGH PRESSURE COOLANT INJECTION SYSTEM ISOLATION				
a. HPCI Steam Line Flow-High	S	~~M~~ Q	R	1, 2, 3
b. HPCI Steam Supply Pressure-Low	S	~~M~~ Q	R	1, 2, 3
c. HPCI Turbine Exhaust Diaphragm Pressure - High	S	~~M~~ Q	R	1, 2, 3
d. HPCI Pipe Penetration Room Temperature - High	S	~~M~~ Q	R	1, 2, 3
e. Suppression Pool Area Ambient Temp. - High	S	~~M~~ Q	R	1, 2, 3
f. Suppression Pool Area ΔT - High	S	~~M~~ Q	R	1, 2, 3
g. Suppression Pool Area Temp. Timer Relays	NA	SA	R	1, 2, 3
h. Emergency Area Cooler Temp. - High	S	~~M~~ Q	R	1, 2, 3
i. Drywell Pressure - High	S	~~M~~ Q	R	1, 2, 3
j. Logic Power Monitor	NA	R	NA	1, 2, 3

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED	
5. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION					
a. RCIC Steam Line Flow-High	S	~~M~~ Q	R	1, 2, 3	
b. RCIC Steam Supply Pressure-Low	S	~~M~~ Q	R	1, 2, 3	
c. RCIC Turbine Exhaust Diaphragm Pressure-High	S	~~M~~ Q	R	1, 2, 3	
d. Emergency Area Cooler Temperature - High	S	~~M~~ Q	R	1, 2, 3	
e. Suppression Pool Area Ambient Temperature-High	S	~~M~~ Q	R	1, 2, 3	
f. Suppression Pool Area ΔT - High	S	~~M~~ Q	R	1, 2, 3	
g. Suppression Pool Area Temp. Timer Relays	NA	SA	R	1, 2, 3	
h. Drywell Pressure - High	S	~~M~~ Q	R	1, 2, 3	
i. Logic Power Monitor	NA	R	NA	1, 2, 3	
6. SHUTDOWN COOLING SYSTEM ISOLATION					
a. Reactor Vessel Water Level - Low (Level 3)	S	~~M~~ Q	R	3, 4, 5	
b. Reactor Steam Dome Pressure - High	S	~~M~~ Q	R	1, 2, 3	

3/4.3.3 EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3 The emergency core cooling system (ECCS) actuation instrumentation shown in Table 3.3.3-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.3-2 and with EMERGENCY CORE COOLING SYSTEM RESPONSE TIME as shown in Table 3.3.3-3.

APPLICABILITY: As shown in Table 3.3.3-1.

ACTION:

a. With an ECCS actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.3-2, declare the channel inoperable and place the inoperable channel in the tripped condition until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

b. With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place the inoperable channel in the tripped condition or declare the associated ECCS inoperable within ~~one hour~~ 12 hours.

c. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, declare the associated ECCS inoperable within one hour.

d. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

e.d. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.3.1 Each ECCS actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.3-1.

4.3.3.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

TABLE 4.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. CORE SPRAY SYSTEM				
a. Reactor Vessel Water Level - Low Low Low (Level 1)	S	~~M~~ Q	R	1, 2, 3, 4, 5
b. Drywell Pressure - High	S	~~M~~ Q	R	1, 2, 3
c. Reactor Steam Dome Pressure - Low	S	~~M~~ Q	R	1, 2, 3, 4, 5
d. Logic Power Monitor	NA	R	NA	1, 2, 3, 4, 5
2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM				
a. Drywell Pressure - High	S	~~M~~ Q	R	1, 2, 3
b. Reactor Vessel Water Level - Low Low Low (Level 1)	S	~~M~~ Q	R	1, 2, 3, 4*, 5*
c. Reactor Vessel Shroud Level (Level 0)	S	~~M~~ Q	R	1, 2, 3, 4*, 5*
d. Reactor Steam Dome Pressure - Low	S	~~M~~ Q	R	1, 2, 3, 4*, 5*
e. Reactor Steam Dome Pressure - Low	S	~~M~~ Q	R	1, 2, 3, 4*, 5*
f. RHR Pump Start-Time Delay Relay	NA	NA	R	1, 2, 3, 4*, 5*
g. Logic Power Monitor	NA	R	NA	1, 2, 3, 4*, 5*

*Not applicable when two core spray subsystems are OPERABLE per Specification 3.5.3.1.

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED#
3. HIGH PRESSURE COOLANT INJECTION SYSTEM				
a. Reactor Vessel Water Level - Low Low (Level 2)	S	M Q	R	1, 2, 3
b. Drywell Pressure-High	S	M Q	R	1, 2, 3
c. Condensate Storage Tank Level - Low	NA	M NA	Q	1, 2, 3
d. Suppression Chamber Water Level - High	S	M Q	R	1, 2, 3
e. Logic Power Monitor	NA	R	NA	1, 2, 3
f. Reactor Vessel Water Level-High (Level 8)	S	M Q	R	1, 2, 3
4. AUTOMATIC DEPRESSURIZATION SYSTEM				
a. Drywell Pressure-High	S	M Q	R	1, 2, 3
b. Reactor Vessel Water Level - Low Low Low (Level 1)	S	M Q	R	1, 2, 3
c. ADS Timer	NA	NA	R	1, 2, 3
d. ADS Low Water Level Actuation Timer	NA	NA	R	1, 2, 3
e. Reactor Vessel Water Level - Low (Level 3)	S	M Q	R	1, 2, 3
f. Core Spray Pump Discharge Pressure - High	S	M Q	R	1, 2, 3
g. RHR (LPCI MODE) Pump Discharge Pressure - High	S	M Q	R	1, 2, 3
h. Control Power Monitor	NA	R	NA	1, 2, 3
5. LOW LOW SET S/RV SYSTEM				
a. Reactor Steam Dome Pressure - High	S	M	R	1, 2, 3

HPCI and ADS are not required to be OPERABLE with reactor steam dome pressure ≤ 150 psig.

INSTRUMENTATION

3/4.3.4 REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.4 The reactor core isolation cooling (RCIC) system actuation instrumentation shown in Table 3.3.4-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.4-2.

APPLICABILITY: CONDITIONS 1, 2 and 3 with reactor steam dome pressure > 150 psig.

ACTION:

a. With a RCIC system actuation instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.4-2, declare the channel inoperable and place the inoperable channel in the tripped condition until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

b. With the requirements for the minimum number of OPERABLE channels not satisfied for one trip system, place the inoperable channel in the tripped condition or declare the RCIC system inoperable within ~~one hour~~ 12 hours.

c. With the requirements for the minimum number of OPERABLE channels not satisfied for both trip systems, declare the RCIC system inoperable within one hour.

d. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.3.4.1 Each RCIC system actuation instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION at the frequencies shown in Table 4.3.4-1.

4.3.4.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months and shall include calibration of time delay relays and timers necessary for proper functioning of the trip system.

TABLE 3.3.4-1

REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION

FUNCTIONAL UNITS	MINIMUM NUMBER OF OPERABLE CHANNELS PER TRIP SYSTEM
a. Reactor Vessel Water Level - Low Low (Level 2) (2B21-N692 A, B, C, D)	2
b. Condensate Storage Tank Water Level - Low (2E51-N060, 2E51-N061)	2(a)
c. Suppression Pool Water Level-High (2E51-N062A, B)	2(a)

(a) Provides Signal to RCIC Pump Suction Valves Only

TABLE 4.3.4-1

REACTOR CORE ISOLATION COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNITS	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION
a. Reactor Vessel Water Level- Low Low (Level 2)	S	~~M~~ Q	R
b. Condensate Storage Tank Level- Low	NA	~~M~~ NA	Q
c. Suppression Pool Water Level- High	NA	~~M~~ NA	Q

3/4.3.5 CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.5 The control rod withdrawal block instrumentation shown in Table 3.3.5-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.5-2.

APPLICABILITY: As shown in Table 3.3.5-1.

ACTION:

a. With a control rod withdrawal block instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.5-2, declare the channel inoperable until the channel is restored to OPERABLE status with its trip setpoint adjusted consistent with the Trip Setpoint value.

b. With the requirements for the minimum number of OPERABLE channels not satisfied for any trip function, place that trip function in the tripped condition within one hour.

d.c. The provisions of Specification 3.0.3 are not applicable in OPERATIONAL CONDITION 5.

SURVEILLANCE REQUIREMENTS

4.3.5 Each of the above required control rod withdrawal block instrumentation channels shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.5-1.

a. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

TABLE 3.3.5-1

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

TRIP FUNCTION	MINIMUM NUMBER OF OPERABLE CHANNELS PER TRIP FUNCTION	APPLICABLE OPERATIONAL CONDITIONS
1. APRM (2C51-K605 A, B, C, D, E, F)		
a. Flow Referenced Simulated Thermal Power - Upscale	4	1
b. Inoperative	4	1, 2, 5
c. Downscale	4	1
d. Neutron Flux - High, 12%	4	2, 5
2. ROD BLOCK MONITOR (2C51-K605 RBM A and B)		
a. Upscale	1	1[a]
b. Inoperative	1	1[a]
c. Downscale	1	1[a]
3. SOURCE RANGE MONITORS (2C51-K600 A, B, C, D)		
a. Detector not full in[b]	3	2
	2	5
b. Upscale[c]	3	2
	2	5
c. Inoperative[c]	3	2
	2	5
d. Downscale[b]	3	2
	2	5
4. INTERMEDIATE RANGE MONITORS[d] (2C51-K601 A, B, C, D, E, F, G, H)		
a. Detector not full in[e]	6	2, 5
b. Upscale	6	2, 5
c. Inoperative	6	2, 5
d. Downscale[e]	6	2
5. SCRAM DISCHARGE VOLUME (2C41-N013E)		
a Water Level-High	1 (g)	1, 2, 5[f]

TABLE 3.3.5-1 (Continued)

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

NOTE

a. When the limiting condition defined in section 3.1.4.3 exists.

b. This function is bypassed if detector is reading > 100 cps or the IRM channels are on range 3 or higher.

c. This function is bypassed when the associated IRM channels are on range 8 or higher.

d. A total of 6 IRM instruments must be OPERABLE.

e. This function is bypassed when the IRM channels are on range 1.

f. With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.11.1 or 3.9.11.2.

g. Withdrawal of control rods is not permitted during required surveillance testing.

TABLE 4.3.5-1

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION(a)	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. APRM:				
a. Flow Referenced Simulated Thermal Power-Upscale	NA	S/U(b),Q	R	1
b. Inoperative	NA	S/U(b),Q	NA	1, 2, 5
c. Downscale	NA	S/U(b),Q	R	1
d. Neutron Flux - High, 12%	NA	S/U(b),Q	R	2, 5
2. Rod Block Monitor:				
a. Upscale	NA	S/U(b),Q	R	1(d)
b. Inoperative	NA	S/U(b),Q	NA	1(d)
c. Downscale	NA	S/U(b),Q	R	1(d)
3. Source Range Monitors:				
a. Detector not full in	NA	S/U(b),W	NA	2, 5
b. Upscale	NA	S/U(b),W	R	2, 5
c. Inoperative	NA	S/U(b),W	NA	2, 5
d. Downscale	NA	S/U(b),W	R	2, 5
4. Intermediate Range Monitors:				
a. Detector not full in	NA	S/U(b),W(c)	NA	2, 5
b. Upscale	NA	S/U(b),W(c)	R	2, 5
c. Inoperative	NA	S/U(b),W(c)	NA	2, 5
d. Downscale	NA	S/U(b),W(c)	R	2, 5
5. Scram Discharge Volume:				
a. Water Level-High	NA	Q	R	1, 2, 5(c)

INSTRUMENTATION

3/4.3.6 MONITORING INSTRUMENTATION

RADIATION MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.1 The radiation monitoring instrumentation channels shown in Table 3.3.6.1-1 shall be OPERABLE with their alarm/trip setpoints within the specified limits.

APPLICABILITY: As shown in Table 3.3.6.1-1.

ACTION:

a. With a radiation monitoring instrumentation channel alarm/trip setpoint exceeding the value shown in Table 3.3.6.1-1, adjust the setpoint to within the limit within 4 hours or declare the channel inoperable.

b. With one or more of the above required radiation monitoring instrumentation channels inoperable, take the ACTION required by Table 3.3.6.1-1.

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

c. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.3.6.1 Each of the above required radiation monitoring instrumentation channels shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations during the OPERATIONAL CONDITIONS and at the frequencies shown in Table 4.3.6.1-1.

INSTRUMENTATION

SEISMIC MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.2 The seismic monitoring instrumentation shown in Table 3.3.6.2-1 shall be OPERABLE.

APPLICABILITY: At all times.

ACTION:

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

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

b. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.3.6.2.1 Each of the above required seismic monitoring instruments shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3.6.2-1.

4.3.6.2.2 Each of the above required seismic monitoring instruments actuated during a seismic event shall be restored to OPERABLE status within 24 hours and a CHANNEL CALIBRATION performed within 30 days following the seismic event. Data shall be retrieved from actuated instruments and analyzed to determine the magnitude of the vibratory ground motion. A Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 10 days describing the magnitude, frequency spectrum and resultant effect upon facility features important to safety.

INSTRUMENTATION

REMOTE SHUTDOWN MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.3 The remote shutdown monitoring instrumentation channels shown in Table 3.3.6.3-1 shall be OPERABLE with readouts displayed external to the control room.

APPLICABILITY: CONDITIONS 1, 2 and 3.

ACTION:

a. With one or more of the above required remote shutdown monitoring instrumentation channels inoperable, either restore the inoperable channel(s) to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

c. b. The provisions of Specification 3.0.4 are not applicable.

b. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.3.6.3 Each of the above required remote shutdown monitoring instrumentation channels shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3.6.3-1.

INSTRUMENTATION

POST-ACCIDENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.4 The post-accident monitoring instrumentation channels shown in Table 3.3.6.4-1 shall be OPERABLE.

APPLICABILITY: CONDITIONS 1, 2, and 3*.

ACTION:

a. With one or more of the above required post-accident monitoring channels inoperable, either restore the inoperable channel(s) to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours.

~~a~~b. The provisions of Specification 3.0.4 are not applicable.

b. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.3.6.4 Each of the above required post-accident monitoring instrumentation channels shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3.6.4-1.

*Condition 3 is applicable only to Items 12, 13, and 14 of Table 3.3.6.4-1.

TABLE 3.3.6.4-1

POST-ACCIDENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE
1. Reactor Vessel Pressure (2B21-R623 A, B)	2
2. Reactor Vessel Shroud Water Level (2B21-R610, 2B21-R615)	2
3. Suppression Chamber Water Level (2T48-R622 A, B)	2
4. Suppression Chamber Water Temperature (2T47-R626, 2T47-R627)	2
5. Suppression Chamber Pressure (2T48-R608, 2T48-R609)	2
6. Drywell Pressure (2T48-R608, 2T48-R609)	2
7. Drywell Temperature (2T47-R626, 2T47-R627)	2
8. Post-LOCA Gamma Radiation (2D11-K622 A, B, C, D)	2
9. Drywell H_2-O_2 Analyzer (2P33-R601 A, B)	2*
10.a) Safety/Relief Valve Position Primary Indicator (2B21-N301 A-H and K-M)	(a)
b) Safety/Relief Valve Position Secondary Indicator (2B21-N004 A-H and K-M)	(a)
11. Drywell High Range Pressure (2T48-R601 A, B)	2
12. Drywell High Range Radiation (2D11-K621 A, B, 2T48-R601A, B)	2(b)
13. Main Stack Post-Accident Effluent Monitor (D11-R631)	1 (b)(c)
14. Reactor Building Vent Plenum Post-Accident Effluent Monitor (2D11-R631)	1 (b)(c)

*The Drywell H_2O_2 Analyzers shall be operable with continuous sampling capability within 30 minutes of an ECCS actuation during a LOCA.

INSTRUMENTATION

SOURCE RANGE MONITORS

LIMITING CONDITION FOR OPERATION

3.3.6.5 Three source range monitors shall be OPERABLE.

APPLICABILITY: CONDITIONS 2*, 3 and 4.

ACTION:

a. In CONDITION 2* with one of the above required source range monitors inoperable, restore 3 source range monitors to OPERABLE status within 4 hours or be in at least HOT SHUTDOWN within the next 6 hours.

b. In CONDITION 3 or 4, with two or more of the above required source range monitors inoperable, verify all control rods to be fully inserted in the core and lock the reactor mode switch in the Shutdown position within one hour.

c. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.3.6.5 Each of the above required source range monitors shall be demonstrated OPERABLE by:

a. Performance of a:

1. CHANNEL CHECK at least once per:

(a) 12 hours in CONDITION 2*, and
(b) 24 hours in CONDITION 3 or 4.

2. CHANNEL CALIBRATION** at least once per 18 months.

b. Performance of a CHANNEL FUNCTIONAL TEST:

1. Within 24 hours prior to moving the reactor mode switch from the Shutdown position if not performed within the previous 7 days, and

2. At least once per 31 days.

c. Verifying, prior to withdrawal of control rods, that the SRM count rate is at least 3 cps with the detector fully inserted.

*With IRMs on range 2 or below.

**May exclude neutron detectors.

MAIN CONTROL ROOM ENVIRONMENTAL CONTROL SYSTEM (MCRECS) ACTUATION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.7 The MCRECS actuation instrumentation channels shown in Table 3.3.6.7-1 shall be OPERABLE, with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.6.7-2.

APPLICABILITY: As shown in Table 3.3.6.7-1.

ACTION: a. As shown in Table 3.3.6.7-1.

b. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.3.6.7 Each MCRECS actuation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION operations during the OPERATIONAL CONDITION and at the frequencies shown in Table 4.3.6 7-1.

TABLE 3.3.6.7-1 (SHEET 2 OF 2)

MCRECS ACTUATION INSTRUMENTATION

ACTION

ACTION 52 - Take the ACTION required by Specification 3.3.3.

ACTION 53 - Take the ACTION required by Specification 3.3.2.

ACTION 54 -

a. With one of the required radiation monitors inoperable, restore the monitor to OPERABLE status within 7 days or, within the next 6 hours, initiate and maintain operation of the MCRECS in the pressurization mode of operation.

b. With no radiation monitors OPERABLE, within 1 hour initiate and maintain operation of the MCRECS in the pressurization mode of operation.

c. The provisions of Specification 3.0.4 are not applicable.

NOTES

* When handling irradiated fuel in secondary containment.

a. Deleted. A channel may be placed in an inoperable status for up to 2 hours for required surveillance without placing the trip system in the tripped condition, provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.

b. With a design providing only one channel per trip system, an inoperable channel need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, the inoperable channel shall be restored to OPERABLE status within 12 hours or the ACTION required by Table 3.3.6.7-1 for that Trip Function shall be taken.

c. Actuates the MCRECS in the control room pressurization mode.

d. (Deleted)

e. Within 24 hours prior to the planned start of the hydrogen injection test with the reactor power at greater than 20-percent 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 test. The background radiation level and associated trip setpoints may be adjusted during the test 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 establishing reactor power levels below 20-percent rated power.

TABLE 4.3.6.7-1

MCRECS ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	TRIP FUNCTION	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1.	Reactor Vessel Water Level - Low Low Low (Level 1)	S	~~M~~ Q	R	1, 2, 3
2.	Drywell Pressure - High	S	~~M~~ Q	R	1, 2, 3
3.	Main Steam Line Radiation - High	~~B~~ S	W(*)	R	1, 2, 3
4.	Main Steam Line Flow - High	S	~~M~~ Q	R	1, 2, 3
5.	Refueling Floor Area Radiation - High	~~B~~ S	~~M~~ Q(a)	Q	1, 2, 3, 5 *
6.	Control Room Air Inlet Radiation - High	NA	~~M~~ Q(a)	R	1, 2, 3, 5, *

* When handling irradiated fuel in the secondary containment.

a. Instrument alignment using a standard current source.

INSTRUMENTATION

RADIOACTIVE LIQUID EFFLUENT INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.9 The radioactive liquid effluent monitoring instrumentation channels shown in table 3.3.6.9-1 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.1.1 are not exceeded. The alarm/trip setpoints of these channels shall be determined in accordance with the OFFSITE DOSE CALCULATION MANUAL (ODCM).

APPLICABILITY

As shown in table 3.3.6.9-1.

ACTION

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

b. With the number of channels OPERABLE less than the minimum channels required by table 3.3.6.9-1, take the ACTION shown in table 3.3.6.9-1.

d. c. The provisions of Specifications 3.0.3, 3.0.4, and 6.9.1.13(b) are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.6.9 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST operations at the frequencies shown in table 4.3.6.9-1.

c. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

INSTRUMENTATION

RADIOACTIVE GASEOUS EFFLUENT INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.6.10 The radioactive gaseous effluent monitoring instrumentation channels shown in table 3.3.6.10-1 shall be OPERABLE with their alarm/trip setpoints set to ensure that the limits of Specification 3.11.2.1(a) are not exceeded. The alarm/trip setpoints of these channels shall be determined in accordance with the ODCM.

APPLICABILITY

As shown in table 3.3.6.10-1.

ACTION

a. With a radioactive gaseous effluent monitoring instrumentation channel alarm/trip setpoint less conservative than a value that will ensure that the limits of 3.11.2.1(a) are met, without delay restore the setpoint to a value that will ensure that the limits of Specification 3.11.2.1(a) are met or declare the channel inoperable.

b. With the number of channels OPERABLE less than the minimum channels required by table 3.3.6.10-1, take the ACTION shown in table 3.3.6.10-1.

c. The provisions of Specifications 3.0.3, 3.0.4, and 6.9.1.13(b) are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.6.10 Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION, and CHANNEL FUNCTIONAL TEST operations at the frequencies shown in table 4.3.6.10-1.

c. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

INSTRUMENTATION

3/4.3.8 DEGRADED STATION VOLTAGE PROTECTION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.8 The degraded station voltage relay channels shown in Table 3.3 8-1 shall be OPERABLE.

APPLICABILITY: CONDITIONS 1, 2, and 3.

ACTION:

a. With the number of OPERABLE channels one less than the required OPERABLE channels, operation may proceed until performance of the next scheduled instrument functional test provided a trip signal is placed in the LOSP lock-out relay logic for the applicable inoperable channel.

SURVEILLANCE REQUIREMENTS

4.3.8 Each of the above required degraded station voltage relay channels shall be demonstrated OPERABLE by performance of the CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operation at the frequencies shown in Table 4.3.8-1.

b. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

INSTRUMENTATION

3/4.3.9 RECIRCULATION PUMP TRIP ACTUATION INSTRUMENTATION

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.9.1 The anticipated transient without scram recirculation pump trip (ATWS-RPT) system instrumentation channels shown in Table 3.3.9.1-1 shall be OPERABLE with their trip setpoints set consistent with values shown in the Trip Setpoint column of Table 3.3.9.1-2.

APPLICABILITY: OPERATIONAL CONDITION 1.

ACTION:

a. With an ATWS recirculation pump trip system instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.9.1-2, declare the channel inoperable until the channel is restored to OPERABLE status with the channel trip setpoint adjusted consistent with the Trip Setpoint value.

b. With the number of OPERABLE channels one less than required by the Minimum OPERABLE Channels per Trip System requirement for one or both trip systems, place the inoperable channel in the tripped condition within ~~1 hour~~ 12 hours.

c. With the number of OPERABLE channels two less than required by the Minimum OPERABLE Channels per Trip System requirement for one trip system and,

   1. If the inoperable channels consist of one reactor vessel water level channel and one reactor vessel pressure channel, place both inoperable channels in the tripped condition within ~~1 hour~~ 12 hours.

   2. If the inoperable channels include two reactor vessel water level channels or two reactor vessel pressure channels, declare the trip system inoperable.

d. With one trip system inoperable, restore the inoperable trip system to OPERABLE status within 14 days or be in at least STARTUP within the next 6 hours.

e. With both trip systems inoperable, restore at least one trip system to OPERABLE status within 1 hour or be in at least STARTUP within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.3.9.1.1 Each ATWS recirculation pump trip system instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3.9.1-1.

4.3.9.1.2 LOGIC SYSTEM FUNCTIONAL TESTS and simulated automatic operation of all channels shall be performed at least once per 18 months.

f. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

INSTRUMENTATION

END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.9.2 The end-of-cycle recirculation pump trip (EOC-RPT) system instrumentation channels shown in Table 3.3.9.2-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.9.2-2 and with the END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM RESPONSE TIME as shown in Table 3.3.9.2-3.

APPLICABILITY: OPERATIONAL CONDITION 1, when THERMAL POWER is greater than or equal to 30% of RATED THERMAL POWER.

ACTION:

a. With an end-of-cycle recirculation pump trip system instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.9.2-2, declare the channel inoperable until the channel is restored to OPERABLE status with the channel setpoint adjusted consistent with the Trip Setpoint value.

b. With the number of OPERABLE channels one less than required by the Minimum OPERABLE Channels per Trip System requirement for one or both trip systems, place the inoperable channel(s) in the tripped condition within ~~one hour~~ 12 hours.

c. With the number of OPERABLE channels two or more less than required by the Minimum OPERABLE Channels per Trip System requirement for one trip system and:

   1. If the inoperable channels consist of one turbine control valve channel and one turbine stop valve channel, place both inoperable channels in the tripped condition within ~~one hour~~ 12 hours.

   2. If the inoperable channels include two turbine control valve channels or two turbine stop valve channels, declare the trip system inoperable.

d. With one trip system inoperable, restore the inoperable trip system to OPERABLE status within 72 hours or reduce THERMAL POWER to less than 30% of RATED THERMAL POWER within the next 6 hours.

e. With both trip systems inoperable, restore at least one trip system to OPERABLE status within one hour or reduce THERMAL POWER to less than 30% of RATED THERMAL POWER within the next 6 hours.

f. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

TABLE 3.3.9.2-1

END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

TRIP FUNCTION	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM(a)
1. Turbine Stop Valve - Closure	2(b)
2. Turbine Control Valve - Fast Closure	2(b)

Deleted.

(a) A trip system may be placed in an inoperable status for up to 2 hours for required surveillance provided that the other trip system is OPERABLE.

(b) This function shall be automatically bypassed when turbine first stage pressure is less than or equal to 250 psig, equivalent to THERMAL POWER less than 30 % of RATED THERMAL POWER.

TABLE 4.3.9.2.1-1

END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM SURVEILLANCE REQUIREMENTS

TRIP FUNCTION	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION
1. Turbine Stop Valve - Closure	Q M*	R
2. Turbine Control Valve - Fast Closure	Q M*	R

*The Recirculation Pump Breakers need not be tripped on part of the Channel Functional Test. All channel alarm functions and only that portion of the trip functions which can be tested without causing a trip of the Breakers (and Recirculation Pumps) need be tested during the Channel Functional Test.

REACTOR COOLANT SYSTEM

3/4.4.2 SAFETY/RELIEF VALVES

LIMITING CONDITION FOR OPERATION

3.4.2.1 The safety valve function of the following reactor coolant system safety/relief valves shall be OPERABLE with the mechanical lift settings within ± 1% of the indicated pressures*.

4 Safety-relief valves @ 1090 psig.
4 Safety-relief valves @ 1100 psig**.
3 Safety-relief valves @ 1110 psig**.

APPLICABILITY: CONDITIONS 1, 2 and 3.

ACTION:

a. For low-low set valves, take the action required by Specification 3.4.2.2. For ADS valves, take the action required by Specification 3.5.2.
b. With one or more safety/relief valves stuck open, place the reactor mode switch in the Shutdown position.
c. With one or more S/RV tailpipe pressure switches of an S/RV declared inoperable and the associated S/RV(s) otherwise indicated to be open, place the reactor mode switch in the shutdown position.
d. With one S/RV tailpipe pressure switch of an S/RV declared inoperable and the associated S/RV(s) otherwise indicated to be closed, plant operation may continue. Remove the function of that pressure switch from the low low set logic circuitry until the next COLD SHUTDOWN. Upon COLD SHUTDOWN, restore the pressure switch(s) to OPERABLE status before STARTUP.
e. With both S/RV tailpipe pressure switches of an S/RV declared inoperable and the associated S/RV(s) otherwise indicated to be closed, restore at least one inoperable switch to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
f. The failure or malfunction of any safety/relief valve shall be reported by telephone within 24 hours; confirmed by telegraph, mailgram, or facsimile transmission to the Director of the Regional Office, or his designee no later than the first working day following the event; and a written followup report within 30 days. The written followup report should be completed in accordance with 10 CFR 50.73 or other applicable requirements.

g. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.4.2.1 The tail-pipe pressure switches of each safety/relief valve shall be demonstrated OPERABLE by performance of:

a. CHANNEL FUNCTIONAL TEST:
   1. At least once per ~~31 days~~ quarter, except that all portions of the channel inside the primary containment may be excluded from the CHANNEL FUNCTIONAL TEST, and
   2. At each scheduled outage of greater than 72 hours during which entry is made into the primary containment, if not performed within the previous ~~31 days~~ quarter.
b. CHANNEL CALIBRATION and verifying the setpoint to be 85 psig, with an allowable tolerance of +15 psig and -5 psig, at least once per 18 months.

* The lift setting pressure shall correspond to ambient conditions of the valves at nominal operating temperature and pressure.
** Up to two inoperable valves may be replaced with spare OPERABLE valves with lower setpoints of 1090 and 1100 psig, respectively, until the next refueling outage.

REACTOR COOLANT SYSTEM

SAFETY/RELIEF VALVES LOW-LOW SET FUNCTION

LIMITING CONDITION FOR OPERATION

3.4.2.2 The relief valve function and the low-low set function of the following reactor coolant system safety/relief valves shall be OPERABLE with the following low-low set function lift settings:

Low Low Set Valve Function	Allowable Value (psig)* Open	Close
Low	≤ 1010	≤ 860
Medium Low	≤ 1025	≤ 875
Medium High	≤ 1040	≤ 890
High	≤ 1050	≤ 900

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 3

ACTION:

a. With the relief valve function and/or the low-low set function of one of the above required reactor coolant system safety/relief valves inoperable, restore the inoperable relief valve function and low-low set function to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. With the relief valve function and/or the low-low set function of more than one of the above required reactor coolant system safety/relief valves inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

c. One instrument channel may be inoperable for up to 12 hours to perform required Surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.4.2.2 The low-low set relief valve function and the low-low set function pressure actuation instrumentation shall be demonstrated OPERABLE by performance of a:

a. CHANNEL FUNCTIONAL TEST, including calibration of the trip unit and the dedicated high steam dome pressure channels**, at least once per ~~month~~ quarter.

b. CHANNEL CALIBRATION, LOGIC SYSTEM FUNCTIONAL TEST and simulated automatic operation of the entire system at least once per refueling outage.

*The lift setting pressure of the valves is defined in subsection 3/4 3.4.2.1. The accuracy of the low-low set setpoints is defined to be the accuracy of the instrumentation controlling the setpoints of the low-low set valves.

**The setpoint for dedicated high steam dome pressure channels is less than or equal to 1054 psig.

REACTOR COOLANT SYSTEM

3/4.4.3 REACTOR COOLANT SYSTEM LEAKAGE

LEAKAGE DETECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

3.4.3.1 The following reactor coolant system leakage detection systems shall be OPERABLE:

a. The primary containment atmosphere particulate radioactivity monitoring system,

b. The primary containment floor drain and equipment sump level and flow monitoring systems, and

c. The primary containment gaseous radioactivity monitoring system.

APPLICABILITY: CONDITIONS 1, 2 and 3.

ACTION:

a. With either the primary containment atmosphere particulate radioactivity monitoring system or the primary containment gaseous radioactivity monitoring system inoperable, operation may continue for 30 days provided grab samples of the containment atmosphere are obtained and analyzed at least once per 8 hours;

b. With at least one leakage monitoring instrument OPERABLE for both the primary containment floor drain sump and the equipment sump, operation may continue for 30 days;

c. Otherwise, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.4.3.1 The leakage detection systems shall be demonstrated OPERABLE by:

a. Primary containment atmosphere gaseous and particulate monitoring system-performance of a CHANNEL CHECK at least once per 8 hours, a CHANNEL FUNCTIONAL TEST at least once per 31 days and a CHANNEL CALIBRATION at least once per 18 months.

b. Primary containment sump level and flow monitoring system-performance of a sensor check at least once per 8 hours, CHANNEL FUNCTIONAL TEST at least once per 31 days and a CHANNEL CALIBRATION at least once per 18 months.

d. One instrument channel may be inoperable for up to 2 hours to perform required surveillances prior to entering other applicable ACTIONS.

3/4.5.3 LOW PRESSURE CORE COOLING SYSTEMS

CORE SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.5.3.1 Two independent Core Spray System (CSS) subsystems shall be OPERABLE with each subsystem comprised of:

a. One OPERABLE CSS pump, and

b. An OPERABLE flow path capable of taking suction from at least one of the following OPERABLE sources and transferring the water through the spray sparger to the reactor vessel;

1. In CONDITION 1, 2 or 3, from the suppression pool.

2. In CONDITION 4 or 5*;

a) From the suppression pool, or

b) When the suppression pool is being drained, from the condensate storage tank containing at least 150,000 gallons of water.

APPLICABILITY: CONDITIONS 1, 2, 3, 4, and 5*.

ACTION

a. In CONDITION 1, 2 or 3;

1. With one CSS subsystem inoperable, POWER OPERATION may continue provided both LPCI subsystems are OPERABLE; restore the inoperable CSS subsystem to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

2. With both CSS subsystems inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

3. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

* The core spray system and the suppression chamber are not required to be OPERABLE provided that the reactor vessel head is removed and the cavity is flooded, the spent fuel pool gates are removed, and the water level is maintained within the limits of Specification 3.9.9 and 3.9.10.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

c. With one suppression chamber water level instrumentation channel inoperable, restore the inoperable channel to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours and verify the suppression chamber water level to be ≥ 12'2" at least once per 12 hours.

d. With both suppression chamber water level instrumentation channels inoperable, restore at least one inoperable channel to OPERABLE status within 6 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours and verify the suppression chamber water level to be ≥ 12'2" at least once per hour.

SURVEILLANCE REQUIREMENTS

4.5.4.1 The suppression chamber shall be determined OPERABLE by verifying:

a. The water level to be ≥ 12'2" at least once per 24 hours.

b. Two suppression chamber water level instrumentation channels (2T48-R607A,B) OPERABLE by performance of a:

1. CHANNEL CHECK at least once per 24 hours,

2. CHANNEL FUNCTIONAL TEST at least once per 31 days, and

3. CHANNEL CALIBRATION at least once per 6 months.

4.5.4.2 The conditions of Specification 3.5.4.b.2 shall be verified to be satisfied prior to draining the suppression pool and at least once per 12 hours thereafter while the suppression pool is drained.

e. One instrument channel may be inoperable for up to 6 hours to perform required Surveillances prior to entering other applicable ACTIONS.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

d. In OPERATIONAL CONDITION 1 or 2 with THERMAL POWER > 1 percent of RATED THERMAL POWER and the average suppression chamber water temperature > 110°F, place the reactor mode switch in the Shutdown position.

e. With the average suppression chamber water temperature > 120°F and the main steam isolation valves closed following a scram from OPERATIONAL CONDITION 1 or 2, depressurize the reactor pressure vessel to < 200 psig at normal cooldown rates.

f. With one suppression chamber water level instrumentation channel inoperable, restore the inoperable channel to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

g. With both suppression chamber water level instrumentation channels inoperable, restore at least one inoperable channel to OPERABLE status within 6 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 The suppression chamber shall be demonstrated OPERABLE:

a. By verifying the suppression chamber water volume to be between 12 ft 2 in. and 12 ft 6 in. at least once per 24 hours

b. At least once per 24 hours in OPERATIONAL CONDITION 1 or 2 by verifying the average* suppression chamber water temperature to be ≤ 100°F.

c. At least once per 5 minutes in OPERATIONAL CONDITION 1 or 2 during testing which adds heat to the suppression chamber, by verifying the average* suppression chamber water temperature ≤ 105°F.

d. At least once per 60 minutes when THERMAL POWER > 1 percent of RATED THERMAL POWER and average* suppression chamber water temperature > 100°F, by verifying average* suppression chamber water temperature < 110°F.

*The average suppression chamber water temperature shall be determined using a weighted average of the suppression pool temperature sensors, as described in BASES subsection 3/4.6.2.

h. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

3/4.9.2 INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.9.2 At least 2 source range monitor* (SRM) channels shall be OPERABLE and inserted to the normal operating level:

a. Each with continuous visual indication in the control room,

b. At least one with an audible alarm in the control room,

c. One of the SRM detectors located in the quadrant where CORE ALTERATIONS are being performed and the other SRM detector located in an adjacent quadrant, and

d. The "shorting links" removed from the RPS circuity during CORE ALTERATIONS and shutdown margin demonstrations.

APPLICABILITY: CONDITION 5.

ACTION:

a. With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS** or positive reactivity changes and actuate the manual scram. The provisions of Specification 3.0.3 are not applicable.

b. One instrument channel may be inoperable for up to 6 hours to perform required surveillances prior to entering other applicable ACTIONS.

SURVEILLANCE REQUIREMENTS

4.9.2 Each of the above required SRM channels shall be demonstrated OPERABLE by:

a. At least once per 12 hours;

1. Performance of a CHANNEL CHECK,

2. Verifying the detectors are inserted to the normal operating level,

3. During CORE ALTERATIONS, verifying that the detector of an OPERABLE SRM channel is located in the core quadrant where CORE ALTERATIONS are being performed and one is located in the adjacent quadrant.

*The use of special movable detectors during CORE ALTERATIONS in place of the normal SRM nuclear detectors is permissible as long as these special detectors are connected to the normal SRM circuits.

**Except movement of SRM or special movable detectors.

3/4.3 INSTRUMENTATION

BASES

Add "Insert B"

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

The reactor protection system automatically initiates a reactor scram to:

a. Preserve the integrity of the fuel cladding.

b. Preserve the integrity of the reactor coolant system.

c. Minimize the energy which must be adsorbed following a loss-of-coolant accident, and

d. Prevent inadvertent criticality.

This specification provides the limiting conditions for operation necessary to preserve the ability of the system to perform its intended function even during periods when instrument channels may be out of service because of maintenance. When necessary, one channel may be made inoperable for brief intervals to conduct the required surveillance tests.

The reactor protection system is made up of two independent trip systems. There are usually four channels to monitor each parameter with two channels in each trip system. The outputs of the channels in a trip system are combined in a logic so that either channel will trip that trip system. The tripping of both trip systems will produce a reactor scram. The system meets the intent of IEEE-279 for nuclear power plant protection systems. The bases for the trip settings of the RPS are discussed in the bases for Specification 2.2.1.

The measurement of response time at the specified frequencies provides assurance that the protective functions associated with each channel are completed within the time limit assumed in the accident analysis. No credit was taken 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 such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either: (1) inplace, onsite or offsite test measurements, or (2) utilizing replacement sensors with certified response times.

Insert B (to P. B 3/4 3-1)

It is permissible to remove a channel from service for a brief interval to conduct required surveillance testing. Notes that dictate the allowable time interval are provided in each ACTION section. An instrument channel that is removed from service for required surveillance testing may be considered inoperable for up to 6 hours in order to perform the required surveillances, prior to entering other applicable ACTIONS.