TABLE 3.2.B (CONTINUED)

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum No. Of Operable Instrument Channels Per Trip System(1)	Trip Function	Trip Level Setting	Number of Instrument Channels Provided by Design	Remarks
1	Core Spray Sparger to Reactor Pressure Vessel d/p	5 (±1.5) psid	2 Inst. Channels	Alarm to detect core spray sparger pipe break.
2	Condensate Storage Tank Low Level	≥5'above tank bottom	2 Inst. Channels	Provides interlock to HPCI pump suction valves.
2	Suppression Chamber High Level	≤5"above normal water level	2 Inst. Channels	Transfers HPCI pump suction to suppression chamber.
2	Condensate Storage Tank Low Level	≥5' above tank bottom	2 Inst. Channels	Transfer RCIC pump suction to suppression chamber

TABLE 3.2.B (CONTINUED)

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum No. Of Operable Instrument Channels Per Trip System(1)	Trip Function	Trip Level Setting	Number of Instrument Channels Provided by Design	Remarks
1	RCIC Turbine High Flow	$\leq$450" H O(2) 2	2 Inst. Channels	
1	RCIC Turbine High Flow Time Delay	3 $\pm$ 1 seconds	2 Inst. Channels	
2	RCIC Turbine Compartment Wall	$\leq$200 deg. F (2)	4 Inst. }	
6	RCIC Steam Line Area Temp.	$\leq$200 deg. F (2)	12 Inst. } 16 Inst.	
2	RCIC Steam Line Low Pressure	100> p> 50 psig (2)	4 Inst.	
1	HPCI Turbine Steam Line High Flow	$\leq$225" H O (3)	2 Inst. Channels	
1	HPCI Turbine High Flow Time Delay	3 $\pm$ 1 seconds	2 Inst. Channels	

TABLE 3.2.F SURVEILLANCE INSTRUMENTATION

Minimum No. of Operable Instrument Channels	Instrument	Type Indication and Range	Action
2	Reactor Water Level (narrow range)	Recorder 0-60" Indicator 0-60"	(6) (7)
1	Reactor Water Level (wide range)	Recorder -165" to +50"	(8)
1	Reactor Water Level (fuel zone)	Recorder -325" to 0"	(8)
2	Reactor Pressure	Recorder 0-1500 psig Indicator 0-1200 psig	(1) (2) (3)
2	Drywell Pressure	Recorder 0-70 psig	(1) (2) (3)
1	Wide Range Drywell Pressure	Recorder 0-225 psig	(8)
1	Subatmospheric Drywell Pressure	Recorder 5-25 psia	(8)
2	Drywell Temperature	Recorder 0-400°F Indicator 0-400°F	(1) (2) (3)
2	Suppression Chamber Water Temperature	Recorder 0-600°F Indicator 0-400°F	(1) (2) (3)
2	Suppression Chamber Water Level	Recorder 0-2 ft. Indicator 0-2 ft.	(1) (5)
1	Wide Range Suppression Chamber Water Level	Recorder 1-21 ft.	(8)

TABLE 3.2.F (Cont'd) - SURVEILLANCE INSTRUMENTS

Minimum No. of Operable Instrument Channels	Instrument	Type Indication and Range	Action
1	Control Rod Position	28 Volt Indicating Lights	(1) (2) (3) (4)
1	Neutron Monitoring	SRM, IRM, LPRM 0-100%	
1	Safety-Relief Valve Position Indication	Acoustic or thermocouple	(8)
1	Containment High Range Radiation Monitors	Recorder $1\text{-}10^8$ R/hr	(8)

TABLE 4.2.B

MINIMUM TEST AND CALIBRATION FREQUENCY FOR CSCS

Instrument Channel	Instrument Functional Test	Calibration Frequency	Instrument Check
1) Reactor Water Level (7)	(1) (3)	Once/operating cycle	Once/day
2) Drywell Pressure (7)	(1) (3)	Once/operating cycle	Once/day
3) Reactor Pressure (7)	(1) (3)	Once/operating cycle	Once/day
4) Auto Sequencing Timers	NA	Once/operating cycle	None
5) ADS - LPCI or CS Pump Disch. Pressure Interlocks	(1)	Once/3 months	None
6) Trip System Bus Power Monitors	(1)	NA	None
7) Core Spray Sparger d/p	(1)	Once/6 months	Once/day
8) Steam Line High Flow (HPCI & RCIC)	(1)	Once/3 months	None
9) Steam Line High Flow Timers (HPCI and RCIC)	NA	Once/operating cycle	None
10) Steam Line High Temp. (HPCI & RCIC)	(1) (3)	Once/operating cycle	Once/day
11) Safeguards Area High Temp.	(1)	Once/3 months	None
12) HPCI and RCIC Steam Line Low Pressure	(1)	Once/3 months	None

TABLE 4.2.B (CONTINUED)
MINIMUM TEST AND CALIBRATION FREQUENCY FOR CSCS

Instrument Channel	Instrument Functional Test	Calibration Frequency	Instrument Check
13) HPCI Suction Source Levels	(1)	Once/3 months	None
14) 4KV Emergency Power System Voltage Relays	Once/operating cycle	Once/5 years	None
15) ADS Relief Valves Bellows Pressure Switches	Once/operating cycle	Once/operating cycle	None
16) LPCI/Cross Connect Valve Position	Once/refueling cycle	N/A	N/A
17) Condensate Storage Tank Level (RCIC)(7)	Once/3 months	Once/operating cycle	None

TABLE 4.2.F UNIT

MINIMUM TEST AND CALIBRATION FREQUENCY FOR SURVEILLANCE INSTRUMENTATION

Instrument Channel	Calibration Frequency	Instrument Check
1) Reactor Water Level (narrow range)	Once/operating cycle	Once Each Shift
2) Reactor Water Level (wide range)	Once/operating cycle	Once/day
3) Reactor Water Level (fuel zone)	Once/operating cycle	Once/day
4) Reactor Pressure	Once/6 months	Once Each Shift
5) Drywell Pressure	Once/6 months	Once Each Shift
6) Wide Range Drywell Pressure	Once/operating cycle	Once/day
7) Subatmospheric Drywell Pressure	Once/operating cycle	Once/day
8) Drywell Temperature	Once/6 months	Once Each Shift
9) Suppression Chamber Temperature	Once/6 months	Once Each Shift
10) Suppression Chamber Water Level	Once/6 months	Once Each Shift
11) Wide Range Suppression Chamber Water Level	Once/operating cycle	Once/day
12) Control Rod Position	NA	Once Each Shift
13) Neutron Monitoring (APRM)	Twice Per Week	Once Each Shift
14) Safety/Relief Valve Position Indicator (acoustics)	Once/operating cycle	Once/month
15) Safety/Relief Valve Position Indicator (thermocouple)	NA*	Once/month
16) Safety Valve Position Indicator (acoustics)	Once/operating cycle	Once/month
17) Safety Valve Position Indicator	NA*	Once/month

TABLE 4.2.F UNIT

MINIMUM TEST AND CALIBRATION FREQUENCY FOR SURVEILLANCE INSTRUMENTATION

Instrument Channel	Calibration Frequency	Instrument Check
(thermocouple)		
18) Containment Radiation Monitors	Once/operating cycle	Once/day

* Perform instrument functional check once per operating cycle.

3.2 BASES (Cont'd)

trip and the other a downscale trip. There is a fifteen minute delay before the air ejector off-gas isolation valve is closed. This delay is accounted for by the 30-minute holdup time of the off-gas before it is released to the stack during reactor power operation when the recombiner system is not operating.

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

Four sets of two radiation monitors are provided which initiate the Reactor Building Isolation function and operation of the standby gas treatment system. Four instrument channels monitor the radiation from the refueling area ventilation exhaust ducts and four instrument channels monitor the building ventilation below the refueling floor. Each set of instrument channels is arranged in a 1 out of 2 twice trip logic.

Trip settings of <16 mr/hr for the monitors in the refueling area ventilation exhaust ducts are based upon initiating normal ventilation isolation and standby gas treatment system operation so that none of the activity released during the refueling accident leaves the Reactor Building via the normal ventilation path but rather all the activity is processed by the standby gas treatment system.

Flow integrators are used to record the integrated flow of liquid from the drywell sumps. The alarm unit in each integrator is set to annunciate before the values specified in Specification 3.6.C are exceeded. An air sampling system is also provided to detect leakage inside the primary containment.

For each parameter monitored, as listed in Table 3.2.F, there are at least two (2) channels of instrumentation. By comparing readings between the channels, a near continuous surveillance of instrument performance is available. Any deviation in readings will initiate an early recalibration, thereby maintaining the quality of the instrument readings.

The recirculation pump trip has been added at the suggestion of ACRS as a means of limiting the consequences of the unlikely occurrence of a failure to scram during an anticipated transient. The response of the plant to this postulated event fall within the envelope of study events given in General Electric Company Topical Report, NEDO-10349, dated March, 1971.

TABLE 3.7.1 (Cont'd.)

PRIMARY CONTAINMENT ISOLATION VALVES

Group	Valve Indentification	No. of Power Operated Valves		Maximum Operating Time (sec.)	Normal Position	Action on Initiating Signal
		Inboard	Outboard			
2D	Drywell equipment drain discharge isolation valves		2	5	O	GC
2D	Drywell floor drain discharge isolation valves		2	5	O	GC
2D	Traveling in-core probe		5	NA	C	SC
4A	HPCI steam line drains		2	NA	O	GC
5A	RCIC steam line drains		2	NA	O	GC
5A	RCIC condensate pump drain		2	NA	O	GC
4A	HPCI condensate pump drain		2	NA	C	SC
2D	Torus water filter pumps suction isolation valves		2	NA	O	CC
4B	HPCI Turbine Exhaust Vacuum Breaker Isolation Valve	1		15	O	GC
5B	RCIC Turbine Exhaust Vacuum Breaker Isolation Valve	1		15	O	GC
4	HPCI steam line exhaust drain		2	NA	O	GC
4	HPCI steam line warm-up*		1	NA	C	SC
6	Nitrogen supply to ADS valves		1	NA	C	SC

1. Reactor vessel low water level.
2. High drywell pressure.
3. Reactor building ventilation exhaust high radiation.
4. Refuel floor ventilation exhaust high radiation.

GROUP 4 : The valves in Group 4 are actuated by any one of the following conditions:

1. HPCI steam line high flow.
2. HPCI steam line space high temperature.
3. HPCI steam line low pressure.

GROUP 4A: The valves in Group 4A are actuated by either of the following conditions:

1. Reactor vessel low-low water level.
2. High drywell pressure.

GROUP 4B: The valve in Group 4B is actuated when both of the following conditions are present:

1. High drywell pressure.
2. HPCI steam line low pressure.

GROUP 5 : The valves in Group 5 are actuated by any one of the following conditions:

1. RCIC steam line high flow.
2. RCIC steam line space high temperature.
3. RCIC steam line low pressure.

GROUP 5A: The valves in Group 5A are actuated by the following condition:

1. Reactor vessel low-low water level.

GROUP 5B: The valve in Group 5B is actuated when both of the following conditions are present:

1. High drywell pressure.
2. RCIC steam line low pressure.

GROUP 6 : The valves in Group 6 are actuated by either of the following conditions:

1. Drywell pressure exceeds nitrogen supply pressure.
2. High nitrogen supply gas flow.

TABLE 3.7.4 (Cont'd.)

PRIMARY CONTAINMENT TESTABLE ISOLATION VALVES

Pen No.		Notes
22	AO-2969A; Check Valve	(1)(2)(4)(5)(10)
25	AO-2520; AO-2505; AO-2519; AO-2521A; AO-2521B	(1)(2)(4)(5)(9)
25	AO-2523; Check Valves	(1)(2)(4)(5)
26	AO-2506; AO-2507	(1)(2)(4)(5)(9)
26	SV-2671G; SV-2978G	(1)(2)(4)(5)
26	AO-2509; AO-2510; AO-4235	(1)(2)(4)(5)(9)
26	SV-4960B; SV-4961B; SV-4966B	(1)(2)(4)(5)
26	SV-8100*	(1)(2)(4)(5)
26, 51C 203, 219	SV-8101*	(1)(2)(4)(5)
39A	MO-10-31B; MO-10-26B	(1)(2)(4)(5)(9)
39A	SV-4949B; SV-4948B	(1)(2)(4)(5)
39B	MO-10-31A; MO-10-26A	(1)(2)(4)(5)(9)
39B	SV-4949A; SV-4948A	(1)(2)(4)(5)
41	AO-2-39; AO-2-40	(1)(2)(4)(5)(9)
42	Check Valve 11-16, XV-14A, XV-14B	(1)(2)(4)(5)(10)
47	SV-8130A, Check Valve	(1)(2)(4)(5)
51A	SV-2671E; SV-2978E	(1)(2)(4)(5)
51B	SV-2671D; SV-2978D	"
51C	SV-2671C; SV-2978C	"
51C	SV-4960C; SV-4961C; SV-4966C	"
51D	SV-2980; Check Valve	"
52F	AO-2969B; Check Valve	(1)(2)(4)(5)(10)
57	AO-2-316; AO-2-317	(1)(2)(4)(5)(9)
102B	Breathing Air System-2 Gate Valves*	(1)(2)(4)(5)(9)
102B	SV-8130B, Check Valve	(1)(2)(4)(5)
203	SV-2671B; SV2978B	(1)(2)(4)(5)

TABLE 3.7.4 (Cont'd.)

PRIMARY CONTAINMENT TESTABLE ISOLATION VALVES

Pen No.		Notes
22	AO-3969A; Check Valve	(1)(2)(4)(5)(10)
25	AO-3520; AO-3505; AO-3519; AO-3521A; AO-3521B	(1)(2)(4)(5)(9)
25	AO-3523; Check Valves	(1)(2)(4)(5)
26	AO-3506; AO-3507	(1)(2)(4)(5)(9)
26	SV-3671G; SV-3978G	(1)(2)(4)(5)
26	AO-3509; AO-3510; AO-5235	(1)(2)(4)(5)(9)
26	SV-5960B; SV-5961B; SV-5966B	(1)(2)(4)(5)
26	SV-9100*	"
26, 51C 203, 219	SV-9101*	"
39A	MO-10-31B; MO-10-26B	(1)(2)(4)(5)(9)
39A	SV-5949B; SV-5948B	(1)(2)(4)(5)
39B	MO-10-31A; MO-10-26A	(1)(2)(4)(5)(9)
39B	SV-5959A; SV-5948A	(1)(2)(4)(5)
41	AO-2-39; AO-2-40	(1)(2)(4)(5)(9)
42	Check Valve 11-16, XV-14A, XV-14B	(1)(2)(4)(5)(10)
47	SV-9130A, Check Valve	(1)(2)(4)(5)
51A	SV-3671E; SV-3978E	(1)(2)(4)(5)
51B	SV-3671D; SV-3978D	"
51C	SV-3671C; SV-3978C	"
51C	SV-5960C; SV-5961C; SV-5966C	
51D	SV-3980; Check Valve	"
52F	AO-3969B; Check Valve	(1)(2)(4)(5)(10)
57	AO-2-316; AO-2-317	(1)(2)(4)(5)(9)
102B	Breathing Air System-2 Gate Valves*	"
102B	SV-9130B, Check Valve	(1)(2)(4)(5)
203	SV-3671B; SV-3978B	(1)(2)(4)(5)

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.8.D Mechanical Vacuum Pump	4.8.D Mechanical Vacuum Pump
1. The mechanical vacuum pump shall be capable of being isolated and secured on a signal of high radioactivity in the steam lines whenever the main steam isolation valves are open.	At least once during each operating cycle verify automatic securing and isolation of the mechanical vacuum pump.
2. If the limits of 3.8.D.1 are not met the vacuum pump shall be isolated.	
3.8.E High Range Radiation Monitoring Systems	4.8.E High Range Radiation Monitoring Systems
1. The high range (10^4 Ci/cc) effluent gas monitors shall be operable on the following release paths: a. Unit 2 reactor building exhaust b. Unit 3 reactor building exhaust c. Plant stack	1. The high range effluent gas monitors shall have an instrument check at least daily, an instrument functional test at least monthly, and calibration at least every fuel cycle with a known radioactive source.
2. The post accident sampling station and associated analytical equipment shall be capable of sampling and analyzing the reactor coolant and containment atmosphere.	2. The operability of the post-accident sampling station and associated analytical equipment shall be verified at least once every six months.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.8.E (Cont'd)	4.8.E (Cont'd)

3. If the requirement of specification 3.8.E.1 cannot be satisfied, either restore the equipment to an operable status within 30 days or be in at least hot shutdown within the next 12 hours.

4. If the requirement of specification 3.8.E.2 cannot be satisfied, confirm within 30 days that alternate arrangements for sampling and analysis of the required samples can be made available within 24 hours in the event that such an analysis is needed or be in at least Hot Shutdown within the next 12 hours, then restore the complete sampling and analysis capability within 90 days or be in at least Hot Shutdown within the next 12 hours.