Bases

3.2 PROTECTIVE INSTRUMENTATION

In addition to reactor protection instrumentation which initiates a reactor scram, station protective instrumentation has been provided which initiates action to mitigate the consequences of accidents which are beyond the reactor operator's ability to control, or terminate a single operator error before it results in serious consequences. This set of Specifications provides the limiting conditions of operation for the primary system isolation function and initiation of the core standby cooling and standby gas treatment systems. The objectives of the Specifications are (i) to assure the effectiveness of any component of such systems even during periods when portions of such systems are out of service for maintenance, testing, or calibration; and (ii) to prescribe the trip settings required to assure adequate performance. This set of Specifications also provides the limiting conditions of operation for the control rod block system and surveillance instrumentation.

Isolation valves (Note 1) are installed in those lines that 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 3.2.2 wh. h senses the condition 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 limits of 10CFR100 are not exceeded during an accident. The objective of the low turbine condenser vacuum trip is to minimize the radioactive effluent releases to as low as practical in case of a main condenser failure. Subsequent releases would continue until operator action was taken to isolate the main condenser unless the main steam line isolation valves were closed automatically on low condenser vacuum. The manual bypass is required to permit initial startup of the reactor during low power operation.

The instrumentation which initiates primary system isolation is connected in a dual-channel arrangement. Thus, the discussion given in the bases for Specification 3.1 is applicable here.

The low reactor water level instrumentation is set to trip when reactor water level is 127" above the top of the enriched fuel. This trip initiates closure of Groups 2 and 3 primary containment isolation valves. For a trip setting of 127" a one the top of the enriched fuel, the valves will be closed before perforation of the clad occurs even for the maximum break and, therefore, the setting is adequate.

The top of the enriched fuel (351.5" from vessel bottom) is designated as a common reference level for all reactor water level instrumentation. The intent is to minimize the potential for operator confusion which may result from different scale references.

Note - Isolation valves are grouped as listed in Table 4.7.2.

3.7 LIMITING CONDITIONS FOR OPERATION	4.7 SURVEILLANCE REQUIREMENTS
e. Minimum Water Volume - 68,000 cubic feet	
f. Maximum Water Volume - 70,000 cubic feet	4.7 STATION CONTAINMENT SYSTEMS
2. Primary containment integrity shall be maintained at all times 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 Mw(t).	2. The primary containment integrity shall be demonstrated as required by Appendix J to 10 CFR Part 50 except where specific written relief has been granted by the NRC persuant to 10CFR50, Sectiin 50.12.

4.7 LIMITING CONDITIONS FOR OPERATION	4.7 SURVEILLANCE REQUIREMENTS
3. Whenever primary containment is required, the total primary containment leakage rate shall not exceed 0.8 weight percent per day (La) at a pressure of 44 psig (Pa).	
4. Whenever primary containment is required, the combined leakage rate for all penetrations and valves, except for MSIVs, shall be less then or equal to 0.6LA. The leakage from any one main steam line isolation valve shall not exceed 15.5 scf/hr at 44 psig (Pa).	
5. Pressure Suppression Chamber - Reactor Building Vacuum Breakers	5. Pressure Suppression Chamber - Reactor Building Vacuum Breakers
a. Two of two pressure suppression chamber-Reactor Building vacuum breaker systems shall be operable at all times when the primary containment integrity is required. The setpoint of the differential pressure instrumentation which actuates the pressure suppression chamber-Reactor Building air-operated vacuum breakers shall be $\leq$ 0.5 psid. The self actuating vacuum breakers shall open fully when subjected to a force equivalent to or less than 0.5 psid acting on the valve disk.	a. The pressure suppression chamber-Reactor Building vacuum breaker systems and associated instrumentation including setpoint shall be checked for proper operator every three months.
b. From and after the date that one of the pressure suppression chamber-Reactor Building vacuum breaker systems is made or found inoperable for any reason, the vacuum breaker shall be locked closed and reactor operation is permissible only during the succeeding seven (7) days unless such vacuum breaker system is soon made operable provided that the procedure does not violate containment integrity.	b. During each refueling outage, each vacuum breaker shall be tested to determine that the force required to open the vacuum breaker does not exceed the force specified in Specification 3.4.A.5.a and each vacuum breaker shall be inspected and verified to meet design requirements.

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TABLE 4.7.2

PRIMARY CONTAINMENT ISOLATION VALVES

Isolation Group (Note 1)	Valve Identification	Number of Power Operated Valves Inboard	Number of Power Operated Valves Outboard	Maximum Operating Time (sec)	Normal Position	Action on Initiating Signal (GC=Goes Closed) (SC=Stays Closed)
1	Main Steam Line Isolation (2-80A, D & 2-86A, D)	4	4	5(note 2)	Open	GC
1	Main Steam Line Drain (2-74, 2-77)	1	1	35	Closed	SC
1	Recirculation Loop Sample Line (2-39, 2-40)	1	1	5	Closed	SC
2	Drywell Floor Drain (20-82, 20-83)		2	20	Open	GC
2	Drywell Equipment Drain (20-94, 20-95)		2	20	Open	GC
3	Drywell Air Purge Inlet (16-19-9)		1	10	Closed	SC
3	Drywell Air Purge Inlet (16-19-8)		1	10	Open	GC
3	Drywell Purge & Vent Outlet (16-19-7A)		1	10	Closed	SC
3	Drywell Purge & Vent Outlet Bypass (16-19-6A)		1	10	Closed	SC
3	Drywell & Suppression Chamber Main Exhaust (16-19-7)		1	10	Closed	SC
3	Suppression Chamber Purge Supply (16-19-10)		1	10	Closed	SC
3	Suppression Chamaber Purge & Vent Outlet (16-19-7B)		1	10	Closed	SC
3	Suppression Chamber Purge & Vent Outlet Bypass (16-19-6B)		1	10	Open	GC
3	Exhaust to Standby Gas Treatment System (16-19-6)		1	10	Open	GC
3	Containment Purge Supply (16-19-23)		1	10	Open	GC
3	Containment Purge Makeup (16-20-20, 16-20-22A, 16-20-22b)		3	NA	Closed	SC
5	Reactor Cleanup System (12-15, 12-18)	1	1	25	Open	GC
6	HPCI (23-15, 23-16)	1	1	55	Open	GC
6	RCIC (13-15, 13-16)	1	1	20	Open	GC
	Primary/Secondary Vacuum Relief (16-19-11A, 16-19-11B)		2	NA	Closed	SC
	Primary/Secondary Vacuum Relief (16-19-12A, 16-19-12B)		2	NA	Closed	Process
3	Containment Air Sampling (VG 23, VG 26, 109-76A&B)		4	5	Open	GC

TABLE 4.7.2 (Continued)

PRIMARY CONTAINMENT ISOLATION VALVES

Isolation Group (Note 1)	Valve Identification	Number of Power Operated Valves Inboard	Number of Power Operated Valves Outboard	Maximum Operating Time (sec)	Normal Position	Action on Initiating Signal (GC = Goes Closed) (SC = Stays Closed)
7	RHR Return to Suppression Pool (10-39A,B)		2	70	Closed	SC
7	RHR Return to Suppression Pool (10-34A,B)		2	120	Closed	SC
7	RHR Drywell Spray (10-26A, B & 10-31A,B)		4	70	Closed	SC
7	RHR Suppression Chamber Spray (10-38A,B)		2	45	Closed	SC
3	Containment Air Compressor Suction (72-38A,B)		2	20	Open	GC
4	RHR Shutdown Cooling Supply (10-18, 10-17)	1	1	28	Closed	SC
4	RHR Reactor Head Cooling (10-32, 10-33)	1	1	25	Closed	SC
	Feedwater Check Valves (2-28A,B,27A,96A)	2	2	NA	Open	Proc.
	Reactor Head Cooling Check Valve (10-29)	1		NA	Closed	Proc.
	Standby Liquid Control Check Valves (11-16, 11-17)	1	1	NA	Closed	Proc.

NOTE: Additional manual valves, which are considered primary containment isolation valves, are identified in the Vermont Yankee Primary Containment Leak Rate Testing Program.

Table 4.7.2 Notes

1. Isolation Signals are as follows:

Group 1: The valve in Group 1 are closed upon any one of the following conditions:

1. Low-low reactor water level
2. High main steam line radiation
3. High main steam line flow
4. High main steam line tunnel temperature
5. Low main steam line pressure (run mode only)
6. Condenser low vacuum

Group 2: The valves in Group 2 are closed upon any one of the following conditions:

1. Low reactor water level
2. High drywell pressure

Group 3: The valves in Group 3 are closed upon any one of the following conditions:

1. Low reactor water level
2. High drywell pressure
3. High/low radiation - Reactor Building ventilation exhaust plenum or refueling floor

Group 4: The valves in Group 4 are closed upon any one of the following conditions:

1. Low reactor water level
2. High drywell pressure
3. High reactor pressure

Table 4.7.2 Notes (Continued)

Group 5: The valves in Group 5 are closed upon low reactor water level.

Group 6: The valves in Group 6 are closed upon any signal representing a steam line break in the HPCI system's or RCIC system's respective steam line. The signals indicating a steam line break for the respective steam line are as follows:

1. High steam line space temperature
2. High steam line flow
3. Low steam line pressure
4. High tempeature in the main steam line tunnel (30 minute delay for the HPCI and the RCIC)

Group 7: The valves in Group 7 are closed upon any one of the following conditions:

1. High drywell pressure
2. Low-low reactor water level and low reactor pressure

2. The closure time shall not be less than 3 seconds.