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Dalwyn R. Davidson
VICE PRESIDENT
SYSTEM ENGINEERING AND CONSTRUCTION

June 8, 1982

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Schwencer:

Perry Nuclear Power Plant
Docket Nos. 50-440; 50-441
SER Confirmatory Issues -
Containment Systems

This letter provides revised responses to Containment Systems Branch Questions 480.48 and TMI Action Item II.E.4.2. These items were discussed in our May 21, 1982, meeting with the NRC Containment Systems Branch reviewer.

It is expected that these revised responses which will be incorporated in a future FSAR amendment, should resolve these issues.

Very truly yours,

Dalwyn R. Davidson

Dalwyn R. Davidson
Vice President
System Engineering and Construction

DRD: mb

cc: Jay Silberg, Esq.
John Stefano
Max Gildner

B001

480.48 With regard to your containment leakage testing program, we will require that:

a) all isolation valves listed in Table 6.2-40 be Type C tested;
b) the feedwater lines(items 9 and 10) be vented and drained for Type C test, tested with air and leakage included in 0.60 La; and
c) HPCS pump discharge to RPV(item 32), and LPCS pump discharge to RPV(item 35) be tested with air and leakage included in 0.60 La.

Response

a) All containment isolation valves listed in Table 6.2-40 will be type C tested, except the isolation valves for instrument lines which penetrate the containment and conform to the requirements at Regulatory Guide 1.11. Isolation valves, pressurized by a water seal system, will be Type C tested with water and the leakage rate, consistent with the Type C test acceptance criteria in 10 CFR 50, Appendix J.

Examples of such lines are discussed in b) and c) below and lines that terminate below the water level of the suppression pool. Sufficient pool inventory is available to maintain a 30 day pressure at 1.10 Pa. The piping up to the isolation valve is seismic Category I, safety class 2. Missile and pipe whip are not concerns for this piping.

b) The feedwater lines are Type C tested with water and the leakage is not included in the 0.60 La. This is consistent with 10 CFR 50 Appendix J acceptance criteria since a dedicated Feedwater leakage control system is provided. Refer to response to 480.35(NOTE 10 to Table 6.2-33) and new FSAR Section 6.9.

c) HPCS and LPCS and LPCI pump discharge lines to the reactor vessel will be Type C tested with air and the largest leakage included in 0.60 La. Consistent with 10 CFR 50, Appendix J acceptance criteria, hydrostatic testing may be performed if a liquid inventory to maintain a water seal is demonstrated, assuming single failure of any active component.

Item II.E.4.2

Containment Isolation Dependability

REQUIREMENT

1. Containment isolation system designs shall comply with the recommendations of Standard Review Plan Section 6.2.4 (i.e., that there be diversity in the parameters sensed for the initiation of containment isolation).

2. All plant personnel shall give careful consideration to the definition of essential and nonessential systems; identify each system determined to be essential; identify each system determined to be nonessential; describe the basis for selection of each essential system; modify their containment isolation designs accordingly; and report the results of the reevaluation to the NRC.

3. All nonessential systems shall be automatically isolated by the containment isolation signal.

4. The design of control systems for automatic containment isolation valves shall be such that resetting the isolation signal will not result in the automatic reopening of containment isolation valves. Reopening of containment isolation valves shall require deliberate operator action.

5. The containment setpoint pressure that initiates containment isolation for nonessential penetrations must be reduced to the minimum compatible with normal operating conditions.

6. Containment purge valves that do not satisfy the operability criteria set forth in Branch Technical Position CSB 6-4 or the Staff Interim Position of October 23, 1979, must be sealed closed as defined in SRP 6.2.4, Item II.3.f during operational conditions 1, 2, 3 and 4. Furthermore, these valves must be verified to be closed at least every 31 days.

7. Containment purge and vent isolation valves must close on a high radiation signal.

RESPONSE

The containment isolation system for PNPP has been reviewed in accordance with NUREG-0737. The results of the review are as follows:

1. In order to evaluate the adequacy of the PNPP containment isolation system, FSAR Table 6.2-32 "Containment Isolation Valve Summary" was reviewed for accuracy, completeness and consistency with the NRC Standard Review Plan Section 6.2.4. The most significant changes appear in the columns labeled "Essential (TMI)" and "Isolation Signal."

2. Because the definition of essential and non-essential systems has been altered since the TMI-2 incident, the containment penetrations were re-evaluated as to their importance in post-accident situations. This re-evaluation was done using Table 6.2-32 (marked-up copy attached). This table provides an assessment of the PNPP systems which can be considered "Essential" or "Non-Essential" for isolation conditions consistent with NUREG-0578, Requirement 2.1.4. As used in this assessment, those systems identified as essential are ESF systems, are regarded as indispensable or are back-up systems in the event of a loss-of-coolant accident. The non-essential systems have been judged to be not required in loss-of-coolant accident situations. In addition, it may be desirable to utilize a non-essential system to mitigate the consequences of an accident. For such circumstances, these systems have been indicated as Essential(*) but they are non-ESF systems which isolate on a containment isolation signal.

3. All non-essential systems and non-ESF/Essential(*) systems isolate on a containment isolation signal.

4. Systems, once isolated, should be capable of being quickly returned to service as the need arises. The review of the FSAR Table 6.2-32 also included examining the effect of resetting the containment isolation signal.

   All automatic isolation valves, with the possible exception of the main steam isolation valves, will remain in the "as is" position when the containment isolation signal(s) is reset.

   After further investigation into the control function of the main steam isolation valves, modification(s), if required, will be made to keep the valve closed after resetting the containment isolation signal. Also, those valves that are identified with a RM_C* in Table 6.2-32, may require a separate remote manual switch in the control room.

5. An evaluation is underway to determine the minimum containment pressure setpoint. This setpoint pressure will be the minimum compatibility with normal operating conditions and will be reflected in technical specification.

6. The containment purge system is designed to achieve the objectives stated in Branch Technical Position CSB 6-4. Purge system containment isolation valves are capable of isolating containment within 5 seconds. The containment purge system is described in FSAR Section 6.5.1.

7. PNPP containment purge and vent valves are to close on high radiation signals. Those that do not isolate on high radiation signals are to be "sealed closed" valves.

TABLE 6.2-32

CONTAINMENT ISOLATION VALVE SUMMARY [1][2]

Penetration Number [3] Unit 1	Unit 2	GDC/ Reg. Guide	System Name	Fluid	Line Size (in)	Pen. Size (in) [4]	Fig. 6.2-40 Arr. No.	Sys. and Valve Number	Loc [5]	Type C Test	Pipe Length [6]	Valve Type	Valve Oper	Actuation Mode Pri.	Actuation Mode Sec.	Valve Position Norm	Valve Position Shut down	Valve Position Post Acc.	Valve Position Pwr Fail [7]	Isolation Signal [8]	Closure Time (sec) [9]	Pen Source 1E Sub [10]	Norm. Flow Dir
P101	P101	GDC56	RCIC Pump Suction	Water	6	Yes	21	E51F031	O	No	20'-8"	Gate	BH	E	M	CL	OP	OP or CL	AI	BH_B,T,J,E,N,F	30	1	Out
P102	P102	GDC56, RG1.11	RCS A Pump Suction Suppression Pool Makeup	Water	24	Yes	13	E12F004A	O	No	18'-4"	Gate	BH	E	M	OP	CL	OP	AI	BH_B	Std.	1	Out
				Water	3/4	Yes	55	GA3F050A	O	Yes	< 10'	Globe	S	E	-	OP	OP	OP	AI	BH_B	<0.25	1	-
P103	P103	GDC56	LPCS Pump Suction	Water	24	Yes	6	E21F001	O	No	14'-7"	Gate	BH	E	M	OP	OP	OP	AI	BH_C	Std.	1	Out
P104	P107	GDC56	RCIC Pump Discharge	Water	2	Yes	18	E51F019	O	No	NA	Globe	BH	E	M	CL	OP	OP or CL	AI	BH_B	5	1	In
			Min. Flow to Sup. Pool	Water	2	Yes	18	E51F021	O	No	19'-0"	Chk	P	P	-	CL	CL	OP or CL	-	Rev. Flow	-	-	In
P105	P106	GDC56	RHR A Min. Flow & Test;	Water	18	Yes	15	E12F024A	O	No	15'-9"	Gate	BH	E	M	CL	CL	CL or OP	AI	C,G,BH_B	90	1	In
			LPCS Pump Min. Flow & Test;	Water	6	Yes	15	E12F046A	O	No	NA	Chk	P	P	-	CL	CL	CL	-	Rev. Flow	-	-	In
			RHR Steam Cond. Mode	Water	4	Yes	15	E12F011A	O	No	18'-9"	Globe	BH	E	M	CL	CL	CL	AI	C,G,BH_B	Std.	1	In
			Bypass Lines	Water	12	Yes	15	E21F012	O	No	21'-9"	Globe	BH	E	M	CL	CL	CL	AI	C,G,AH_B	Std.	1	In
				Water	4	Yes	15	E21F011	O	No	24'-0"	Globe	BH	E	M	OP	OP	OP	AI	BH_C	Std.	1	In
				Water	6	Yes	15	E12F064A	O	No	77'-7"	Gate	BH	E	M	OP	OP	OP	AI	BH_B	<8	1	In
P106	P108	GDC56	RCIC Turbine Exhaust	Steam	12	Yes	10(b)	E51F068	O	No	NA	Gate	BH	E	M	OP	OP	OP	AI	BH_B	30	1	In
				Steam	12	Yes	10(b)	E51F040	O	No	27'-10"	Chk	I	P	-	OP	CL	CL	-	Rev. Flow	-	-	In
P107	P109	GDC56	RHR A Loop Relief Line	Water	6	Yes	37	E12F055A	O	No	77'-3"	Rel	P	P	-	CL	CL	CL	-	-	-	-	In
			to Sup. Pool	Water	2	Yes	37	E12F025A	O	No	29'-6"	Rel	P	P	-	CL	CL	CL	-	-	-	-	In
				Water	1-1/2	Yes	37	E12F103A	O	No	42'-3"	Chk	P	P	-	CL	CL	CL	-	Rev. Flow	-	-	In
				Water	2	Yes	37	E21F018	O	No	37'-0"	Rel	P	P	-	CL	CL	CL	-	-	-	-	In
P108	P424	GDC56	Condensate Supply	Cond.	12	No 465*	27(a)	P11-F060	O	Yes	10'-9"	B'fly	EH	E	M	OP	OP	CL	AI	B,C,BH_C	30	1	In
					12	No 465*	27(a)	P11-F545	I	Yes	NA	Chk	P	P	-	OP	OP	CL	-	Rev. Flow	-	-	In
P109	P428	GDC56	Containment Leak Rate	Cont. Atmos.	8	No	35(b)	Spect. Flange	O	Yes	-	-	-	-	-	-	-	-	-	-	-	-	Out
			Test Connection Blowdown	Cont. Atmos.	8	No	35(b)	Spect. Flange	I	Yes	-	-	-	-	-	-	-	-	-	-	-	-	Out
			Line																				
P111	P426	GDC56	Condensate Return	Water	10	No	27(b)	P11F080	O	Yes	13'-0"	B'fly	EH	E	M	OP	OP	CL	AI	B,C,BH_C	30	1	Out
			(Containment Pool Drain	Water	10	No	27(b)	P11F090	I	Yes	NA	B'fly	EH	E	M	CL	CL	CL	AI	B,C,BH_C	30	2	Out
			Line)																				
P112	P113	GDC55	LPCS Pump Discharge to	Water	12	Yes	7	E21F005	O	No	29'-0"	Gate	EH	E	M	CL	CL	OP	AI	BH_C	27	1	In
			Reactor Pressure Vessel	Water	12	Yes	7	E21F006	I	No	NA	Chk	P	(11)	-	CL	CL	OP	-	Rev. Flow	-	-	In
P113	P114	GDC55	LPCI A to Reactor and RHR	Water	12	Yes	11	E12F027A	O	No	25'-9"	Gate	EH	E	M	OP	OP	OP	AI	BH_B	Std.	1	In
			to Containment Spray and	Water	12	Yes	11	E12F042A	I	No	NA	Gate	EH	E	M	CL	CL	OP	AI	BH_B	27	1	In
			Containment Pool Cooling	Water	12	Yes	11	E12F041A	I	No	NA	Chk	P	(11)	-	CL	CL	OP	-	Rev. Flow	-	-	In
					12	Yes	11	E12F017A	I	No	NA	Globe	EH	E	M	CL	OP	OP or CL	AI	A,J,BH_B	Std.	1	In
					12	Yes	11	E12F024A	I	No	NA	Gate	EH	E	M	CL	CL	OP	AI	BH_B	60	1	In
P114	P121	GDC56	Containment Vacuum	Cont. Atmos.	24	Yes	19	M17F015	O	Yes	2'-6"	B'fly	EH	E	M	OP	OP	CL	AI	B,C,E,BH_C	5	1	In
			Relief	Cont. Atmos.	24	Yes	19	M17F010	I	Yes	NA	Chk	P	Y	-	CL	CL	CL	-	Rev. Flow	-	-	In
P115	P111	GDC56	RCIC Turbine Exhaust	Cont. Atmos.	2	Yes 465	10(a)	E51F078	O	Yes	NA	Globe	EH	E	M	OP	OP	OP	AI	C & J, BH_B	Std.	1	Out
			Vacuum Relief	Cont. Atmos.	2	No 465	10(a)	E51F077	O	Yes	27'-3"	Globe	EH	E	M	OP	OP	OP	AI	C & J, BH_B	7.5	2	Out

TABLE 6.2-32 (Continued)

Penetration Number[3] Unit 1	Unit 2	GDC/ Reg. Guide	System Name	Fluid	Line Size (in)	ESF Sys. [4]	Fig. 6.2-60 Arr. No.	Sys. and Valve Number	Loc. [5]	Type C Test	Pipe Length[6]	Valve Type	Valve Oper.	Actuation Mode Pri.	Actuation Mode Sec.	Valve Position Norm	Valve Position Shut down	Valve Position Post Acc.	Valve Position Pwr. Fail[7]	Isolation Signal[8]	Closure Time(sec)[9]	Pwr Source 1E Bus[10]	Norm. Flow Dir.
P116	P135	GDC57	Air Supply to ADS Accumulator	Air	1	Yes	33	P57F020A	I	Yes	NA	Globe	EM	E	M	OP	OP	CL	AI	RM_C	Std.	1	In
				Air	1	Yes	33	P57F015A	O	Yes	16'-9"	Globe	EM	E	M	OP	OP	CL	AI	RM_C	Std.	1	In
P117	P123	GDC57	Nitrogen Supply to Control Rod Drive	Nitrogen	2	No	41	P86F002	O	Yes	< 20'	Globe	EM	E	M	CL	CL	CL	AI	B,C,RM_C	Std.	1	In
				Nitrogen	2	No	41	P86F528	I	Yes	NA	Chk	P	P	-	CL	CL	CL	-	Rev. Flow	-	-	In
P118	P133	GDC56	RHR Heat Exchanger Vent to Suppression Pool	Noncondens.	1	Yes	45	E12F073A	O	No	12'-9"	Globe	EM	E	M	CL	CL	CL	AI	RM_C	Std.	1	In
				Noncondens.	1	Yes	45	E12F558A	I	No	NA	Chk	P	P	-	CL	CL	CL	-	Rev. Flow	-	-	In
P119	P110	GDC56	Containment Leak Rate Test PI	Cont. Atmos.	1/2	No	35	Spect. Flange	O	Yes	NA	-	-	-	-	-	-	-	-	-	-	-	Out
				Cont. Atmos.	1/2	No	35	Spect. Flange	I	Yes	NA	-	-	-	-	-	-	-	-	-	-	-	Out
P120	P627	GDC56	Containment Leak Rate - Pressurization Line	Air	8	No	35(b)	Spect. Flange	O	Yes	NA	-	-	-	-	-	-	-	-	-	-	-	In
				Air	8	No	35(b)	Spect. Flange	I	Yes	NA	-	-	-	-	-	-	-	-	-	-	-	In
P121	P112	GDC55	Feedwater A, RHR, and RCIC Return to Reactor Pressure Vessel	Water	20	Yes	2	B21F065A	O	Yes	38'-5-3/4"	Gate	EM	E	M	OP	CL	OP or CL	AI	RM_C	Std.	1	In
				Water	20	Yes	2	B21F032A	O	Yes	NA	Chk	P	A[12]	P	OP	CL	OP or CL	FC	RM_C	-	-	In
				Water	20	Yes	2	N27F559A	I	Yes	NA	Chk	P	P	-	O	CL	CL	-	Rev. Flow	-	-	In
				Water	12	Yes	2	E12F050A	O	Yes	NA	Chk	P	P	-	CL	CL	CL	-	Rev. Flow	-	-	In
				Water	12	Yes	2	E12F051A	O	Yes	81'-11-3/4"	Globe	EM	E	M	CL	CL	CL	AI	A,O,M,RM_B	Std.	1	In
				Water	6	Yes	2	G33F052A	O	Yes	NA	Chk	P	P	-	OP	OP	CL	-	Rev. Flow	-	-	In
				Water	6	Yes	2	G33F039	O	Yes	19'-11-3/4"	Gate	EM	E	M	OP	OP	CL	AI	B,F,H,W,T,RM_C	15	1	In
P122	P113	GDC55	Main Steam Line C	Steam	2[14]	Yes	1(a)	B21F028C	O	Yes	17'-2-3/4"	Globe	A	A	SP	OP	CL	CL	FC	C,D,E,F,S,M,P,RM_C	(13)	-	Out
				Steam	26	Yes	1(a)	B21F022C	I	Yes	NA	Globe	A	A	SP	OP	CL	CL	FC	C,D,E,F,S,M,P,RM_C	(13)	-	Out
				Steam	1-1/2	No	1(a)	B21F067C	O	Yes	25'-2-3/4"	Globe	EM	E	M	OP	CL	CL	AI	C,D,E,F,S,M,P,RM_C	Std.	1	Out
				Steam	1-1/2	No	1(a)	E32F001J	O	Yes	21'-2-3/4"	Gate	EM	E	M	CL	CL	CL	AI	RM_C*,U	Std.	1	Out
P123	P117	GDC55	RCIC Pump Discharge and RHR Head Spray	Water	6	Yes	5	E51F066	I	Yes	NA	Chk	P	(11)	-	CL	CL	OP or CL	-	Rev. Flow	-	-	In
				Water	6	Yes	5	E51F065	O	Yes	NA	Chk	P	(11)	-	CL	CL	OP or CL	-	Rev. Flow	-	-	In
				Water	6	Yes	5	E51F013	O	Yes	43'-6"	Gate	EM	E	M	CL	CL	OP or CL	AI	RM_B	15	1	In
				Water	6	Yes	5	E12F023	O	Yes	50'-5"	Globe	EM	E	M	CL	CL	OP or CL	AI	A,M,V,RM_B	Std.	1	In
				Water	6	Yes	5	E12F019	O	Yes	NA	Chk	P	P	-	CL	CL	OP or CL	-	Rev. Flow	-	-	In
P124	P116	GDC55	Main Steam Line A	Steam	26	Yes	1(a)	B21F028A	O	Yes	16'-5-7/8"	Globe	A	A	SP	OP	CL	CL	FC	C,D,E,F,S,M,P,RM_C	(13)	-	Out
				Steam	26	Yes	1(a)	B21F022A	I	Yes	NA	Globe	A	A	SP	OP	CL	CL	FC	C,D,E,F,S,M,P,RM_C	(13)	-	Out
				Steam	1-1/2	No	1(a)	B21F067A	O	Yes	23'-5-7/8"	Globe	EM	E	M	OP	CL	CL	AI	C,D,E,F,S,M,P,RM_C	Std.	1	Out
				Steam	1-1/2	No	1(a)	E32F001A	O	Yes	20'-5-7/8"	Gate	EM	E	M	CL	CL	CL	AI	RM_C*,U	Std.	1	Out
P131	P132	GDC55	RWCU Pump Suction	Water	6	Yes	49	G33F001	I	Yes	NA	Gate	EM	E	M	OP	OP	CL	AI	B,F,H,W,T,RM_C	15	2	Out
				Water	6	Yes	49	G33F004	O	Yes	14'-0"	Gate	EM	E	M	OP	OP	CL	AI	B,F,H,W,T,RM_C	15	1	Out
P132	2408	GDC55	RWCU Line from Regenerative Heat Exchanger to Feedwater	Water	6	Yes	44	G33F040	I	Yes	NA	Gate	EM	E	M	OP	OP	CL	AI	B,F,H,W,T,RM_C	15	2	Out
				Water	6	Yes	44	G33F039	O	Yes	10'-9"	Gate	EM	E	M	OP	OP	CL	AI	B,F,H,L,W,T,RM_C	15	1	Out

TABLE 6.2-32 (Continued)

Penetration Number[3] Unit 1	Unit 2	GDC Reg. Guide	System Name	Fluid	Line Size (in)	ESF Sys. [4]	Fig. 6.2-63 Arr. No.	Sys. and Valve Number	Loc. [5]	Type C Test	Pipe Length [6]	Valve Type	Oper	Actuation Mode Pri.	Actuation Mode Sec.	Valve Position Norm	Valve Position Shut down	Valve Position Post Acc.	Valve Position Per. Fail[7]	Isolation Signal [8]	Closure Time(sec)[9]	Pwr. Source If Bus[13]	Norm. Flow Dir.
P201	P218	GDC56	Drywell Atmosphere Radiation Monitor Line	Drywell Atm.	1	No	52	D17F079A	O	Yes	< 10'	Globe	S	E	-	OP	OP	CL	CL	A,C,RM_C	< 0.25	1	In
				Drywell Atm.	1	No	52	D17F079B	I	Yes	< 10'	Globe	S	E	-	OP	OP	CL	CL	A,C,RM_C	< 0.25	2	In
				Drywell Atm.	1	No	52	D17F071A	O	Yes	< 10'	Ball	EM	E	M	OP	OP	CL	AI	A,C,RM_C	< 1.0	1	Out
				Drywell Atm.	1	No	52	D17F071B	I	Yes	< 10'	Ball	EM	E	M	OP	OP	CL	AI	A,C,RM_C	< 1.0	2	Out
P203 ✓	P301	GDC56	Fuel Pool Cooling Supply	Water	8	No	26(a)	C41F100	O	Yes	10'-9"	B'fly	EM	E	M	OP	OP	CL	AI	A,C,RM_C	30	1	In
				Water	8	No	26(a)	C41F522	I	Yes	NA	Chk	P	P	-	OP	OP	CL	-	Rev. Flow	-	-	In
P204	P302	GDC55	Control Rod Drive to Reactor Pressure Vessel	Condensate	2-1/2	Yes	3	C11F083	O	Yes	18'-0"	Gate	EM	E	M	OP	OP	CL	AI	RM_C	Std.	1	In
				Condensate	2-1/2	Yes	3	C11F122	I	Yes	NA	Chk	P	P	-	OP	OP	CL	-	Rev. Flow	-	-	In
P205	P304	GDC56	Fuel Transfer Tube [15]	Water	36	No	36	F42F004	O	No	34'-0"	Gate	M	M	M	CL OP or CL		CL	NA	-	< 60	-	In or Out
				Water	36	No	36	F42F002	I	No	NA	Gate	M	M	-	CL OP or CL		CL	NA	-	-	-	In or Out
P208	P122	GDC56	Containment Vacuum Relief	Cont. Atmos.	24	Yes	19	1 7F025	O	Yes	"'-6"	B'fly	EM	E	M	OP	OP	CL	AI	B,G,X,RM_C	5	1	In
				Cont. Atmos.	24	Yes	19	7F020	I	Yes	NA	Chk	P	V	-	CL	CL	CL	-	Rev. Flow	-	-	In
P210	P206	GDC57	Carbon Dioxide to Fire Protection System	CO_2	4	No	42	P54F340	O	Yes	12'-6"	Gate	EM	E	M	CL	CL	CL	AI	B,G,RM_C	20	1	In
				CO_2	4	No	42	P54F395	I	Yes	NA	Gate	EM	E	M	CL	CL	CL	AI	B,G,RM_C	20	1	In
P101 ✓	P222	GDC56	Fuel Pool Cooling Return	Water	10	No	26(b)	C41F145	O	Yes	13'-0"	B'fly	EM	E	M	OP	OP	CL	AI	B,G,RM_C	30	1	Out
				Water	10	No	76(b)	C41F140	I	Yes	NA	B'fly	EM	E	M	OP	OP	CL	AI	B,G,RM_C	30	2	Out
P102	P211	GDC56	Backup Hydrogen Purge System	Drywell Atm.	2	Yes	19(b)	M51F110	O	Yes	18'-0"	Globe	EM	E	M	CL	OP or CL	CL	AI	RM_C	Std.	1	Out
				Drywell Atm.	2	Yes	19(b)	M51F090	I	Yes	NA	Globe	EM	E	M	CL	OP or CL	CL	AI	RM_C	Std.	2	Out
P104 ✓	P303	GDC57	Air Supply to ADS Accumulators	Air	1	Yes	33	P57F015B	O	Yes	14'-6"	Globe	EM	E	M	OP	OP	CL	AI	RM_C	Std.	2	In
				Air	1	Yes	33	P57F020B	I	Yes	NA	Globe	EM	E	M	OP	OP	CL	AI	RM_C	Std.	2	In
P305 ✓	P205	GDC56	Instrument Air	Air	3/4	Yes	56	P53F030	O	Yes	< 10'	Globe	S	E	-	OP	OP	CL	AI	B,G,RM_C	< 0.25	1	In
				Air	3/4	Yes	56	P53F035	O	Yes	< 10'	Globe	S	E	-	OP	OP	CL	AI	B,G,RM_C	< 0.25	1	In
				Air	3/4	Yes	56	P53F050	I[14]	Yes	NA	Globe	S	E	-	OP	OP	CL	AI	B,G,RM_C	< 0.25	1	In
				Air	3/4	Yes	56	P53F055	I[14]	Yes	NA	Globe	S	E	-	OP	OP	CL	AI	B,G,RM_C			In
				Air	3/4	Yes		P52F160	O	Yes		Globe	S	E	-	OP	OP	CL	AI	B,G,RM_C	Std.	1	In
P306 ✓	P204	GDC57	Instrument Air	Air	2	Yes	34	P52F200	O	Yes	24'-6"	Globe	EM	E	M	OP	OP	CL	AI	B,G,RM_C			In
				Air	2	Yes	34	P52F550	I	Yes	NA	Chk	P	P	-	OP	OP	CL	-	Rev. Flow	-	-	In
P308 ✓	P203	GDC57	Service Air	Air	2-1/2	No	32	P51F150	O	Yes	11'-3"	Globe	A	A	M	OP	OP	CL	FC	B,G,RM_C	15	1	In
				Air	2-1/2	No	32	P51F530	I	Yes	NA	Chk	P	P	-	OP	OP	CL	-	Rev. Flow	-	-	In

TABLE 6.2-32 (Continued)

Penetration Number[3] Unit 1	Unit 2	GDC/ Reg. Guide	System Name	Fluid	Line Size (in)	ESF Sys[4]	Fig. 6.2-60 Arr. No.	Sys. and Valve Number	Loc.[5]	Type C Test	Pipe Length[6]	Valve Type	Oper	Actuation Mode Pri	Actuation Mode Sec.	Valve Position Norm	Valve Position Shut down	Valve Position Post Acc.	Valve Position Per Fail[7]	Isolation Signal[8]	Closure Time(sec)[9]	Pwr Source IE Bus[10]	Norm. Flow Dir.
P309	P207	GDC57	Demineralized Water	Demin. Wtr.	3	No	29	P22F010	O	Yes	17'-3"	Gate	MM	E	M	OP	OP	CL	AI	A,G,RM_C	Std.	1	In
				Demin. Wtr.	3	No	29	P22F577	I	Yes	NA	Chk	P	P	-	OP	OP	CL	-	Rev. Flow	-	-	In
P310	P201	GDC57	Nuclear Closed Cooling Water Supply	Water	12	No	25(a)	P43F055	O	Yes	8'-6"	B'fly	EM	E	M	OP	OP	CL	AI	A,G,RM_C	30	1	In
				Water	12	No	25(a)	P43F721	I	Yes	NA	Chk	P	P	-	OP	OP	CL	-	Rev. Flow	-	-	In
P311	P202	GDC57	Nuclear Closed Cooling Water Return	Water	12	No	25(b)	P43F140	O	Yes	8'-6"	B'fly	EM	E	M	OP	OP	CL	AI	A,G,RM_C	30	1	Out
				Water	12	No	25(b)	P43F215	I	Yes	NA	B'fly	EM	E	M	OP	OP	CL	AI	A,G,RM_C	30	2	Out
P312	P215	GDC56	Instrument Air	Air	3/4	Yes	56	P53F040	O	Yes	<10'	Globe	S	E	-	OP	OP	CL	AI	A,G,RM_C	<0.25	2	In
				Air	3/4	Yes	56	P53F045	O	Yes	<10'	Globe	S	E	-	OP	OP	CL	AI	A,G,RM_C	<0.25	2	In
				Air	3/4	Yes	56	P53F060	I[14]	Yes	<10'	Globe	S	E	-	OP	OP	CL	AI	A,G,RM_C	<0.25	2	In
				Air	3/4	Yes	56	P53F065	I[14]	Yes	<10'	Globe	S	E	-	OP	OP	CL	AI	A,G,RM_C	<0.25	2	In
				Air	3/4	No		P52F170	O	Yes		Globe	S	E	-	OP	OP	CL	AI	A,G,RM_C			
V113	V216	GDC56	Containment Purge Supply	Cont. Atmos.	42	No	30(a)	M14F040	O	Yes	2'-0"	B'fly	A	A	M	OP	OP	CL	FC	A,G,RM_C,I	4	NA	In
				Cont. Atmos.	42	No	30(a)	M14F045	I	Yes	NA	B'fly	A	A	M	CL	OP	CL	FC	A,G,RM_C,I	4	NA	In
				Cont. Atmos.	18	No	30(a)	M14F190	I	Yes	NA	B'fly	A	A	M	OP	OP	CL	FC	A,G,RM_C,I	4	NA	In
V114	V214	GDC56	Containment Purge Exhaust	Cont. Atmos.	42	No	30(b)	M14F090	O	Yes	2'-0"	B'fly	A	A	M	OP	OP	CL	FC	A,G,RM_C,I	4	NA	Out
				Cont. Atmos.	42	No	30(b)	M14F085	I	Yes	NA	B'fly	A	A	M	CL	OP	CL	FC	A,G,RM_C,I	4	NA	Out
				Cont. Atmos.	18	No	30(b)	M14F200	I	Yes	NA	B'fly	A	A	M	OP	OP	CL	FC	A,G,RM_C,I	4	NA	Out
P317	P217	GDC56	Containment Atmosphere Radiation Monitor Line	Cont. Atmos.	1	No	54	D1	O	Yes	<10'	Globe	S	E	-	OP	OP	CL	AI	A,G,RM_C	<0.25	1	In
				Cont. Atmos.	1	No	54	D17F[illegible]	I	Yes	NA	Globe	S	E	-	OP	OP	CL	AI	A,G,RM_C	<0.25	2	In
				Cont. Atmos.	1	No	54	D17F081A	O	Yes	<10'	Ball	EM	E	M	OP	OP	CL	CL	A,G,RM_C	<1.0	1	Out
				Cont. Atmos.	1	No	54	D17F081B	I	Yes	NA	Ball	EM	E	M	OP	OP	CL	CL	A,G,RM_C	<1.0	2	Out
		GDC56	Containment Leak Rate	Cont. Atmos.	1/2	No	35	Spect. Flange	O	Yes	NA	-	-	-	-	-	-	-	-	-	-	-	Out
				Cont. Atmos.	1/2	No	35	Flange	I	Yes	NA	-	-	-	-	-	-	-	-	-	-	-	Out
		GDC56	Containment Leak Rate	Cont. Atmos.	3/4	No	35	Spect. Flange	O	Yes	NA	-	-	-	-	-	-	-	-	-	-	-	Out
				Cont. Atmos.	3/4	No	35	Flange	I	Yes	NA	-	-	-	-	-	-	-	-	-	-	-	Out
P318	P422, P423	RG1.11	Combustible Gas Control Post Accident Hydrogen Analyzer	Cont. Atmos.	1/2	Yes	58(a)	M51F210B	O	Yes	<10'	Globe	S	E	-	CL	CL	OP	AI	RM_C	<0.25	2	Out
				Drywell Atm.	1/2	Yes	58(a)	M51F220B	O	Yes	<10'	Globe	S	E	-	CL	CL	OP	AI	RM_C	<0.25	2	Out
				Drywell Atm.	1/2	Yes	58(a)	M51F230B	O	Yes	<10'	Globe	S	E	-	CL	CL	OP	AI	RM_C	<0.25	2	Out
				Cont. Atmos.	1/2	Yes	58(a)	M51F240B	O	Yes	<10'	Globe	S	E	-	CL	CL	OP	AI	RM_C	<0.25	2	Out
				Water	1/2	Yes	58(a)	M51F250B	O	Yes	<10'	Globe	S	E	-	CL	CL	OP	AI	RM_C	<0.25	2	In
P319	P422	RG1.11	Containment Pressure	Cont. Atmos.	3/4	Yes	38(b)	D23F030B	O	Yes	<10'	Globe	S	E	-	OP	OP	OP	AI	RM_C	<0.25	2	-
		RG1.11	Drywell Pressure	Cont. Atmos.	3/4	Yes	38(a)	D23F040B	O	Yes	<10'	Globe	S	E	-	OP	OP	OP	AI	RM_C	<0.25	2	-
		GDC56	Containment Leak Rate	Cont. Atmos.	3/4	No	35	Spect. Flange	O	Yes	NA	-	-	-	-	-	-	-	-	-	-	-	Out
				Cont. Atmos.	3/4	No	35	E61F551	I	Yes	NA	Globe	M	M	-	CL	CL or OP	CL	-	-	-	-	Out
		GDC56	Containment Leak Rate	Cont. Atmos.	1/2	No	35	Spect. Flange	O	Yes	NA	-	-	-	-	-	-	-	-	-	-	-	Out
				Cont. Atmos.	1/2	No	35	E61F552	I	Yes	NA	Globe	M	M	-	CL	CL or OP	CL	-	-	-	-	Out
P320	P423	RG1.11	Containment Vacuum Relief	Cont. Atmos.	3/4	Yes	59	M17F065	O	Yes	<10'	Globe	S	E	-	CP	OP	OP	AI	RM_C	<0.25	2	-
		RG1.11	Containment Pressure	Cont. Atmos.	3/4	Yes	38(b)	D23F070B	O	Yes	<10'	Globe	S	E	-	OP	OP	OP	AI	RM_C	<0.25	2	-
		RG1.11	Suppression Pool Level Reference Leg	Cont. Atmos.	3/4	Yes	38(b)	D23F010B	O	Yes	<10'	Globe	S	E	-	OP	OP	OP	AI	RM_C	<0.25	2	-

TABLE 6.2-32 (Continued)

Penetration Number[3] Unit 1	Unit 2	GDC/ Reg. Guide	System Name	Fluid	Line Size (in)	ESF Sys[4]	Fig. 6.2-40 Arr. No.	Sys. and Valve Number	Loc. [5]	Type C Test	Pipe Length[6]	Valve Type	Valve Oper	Actuation Mode Pri	Actuation Mode Sec.	Valve Position Norm	Valve Position Shut down	Valve Position Post Acc.	Valve Position Pwr. Fail[7]	Isolation Signal[8]	Closure Time(sec)[9]	Per Source If Bus[10]	Norm. Flow Dir.
P401	P401	GDC56 RG1.11	HPCS Pump Suction Suppression Pool Makeup	Water Water	24 3/4	Yes Yes	8 55	E22F015 GA1F060	O O	No Yes	18'-3" <10'	Gate Globe	EM S	E E	M -	CL OP	CL OP	OP or CL OP	AI AI	RM_C RM_C	24 <0.25	3 3	Out -
P402	P402	GDC56 RG1.11	RHR B Pump Suction Suppression Pool Makeup	Water Water	24 3/4	Yes Yes	13 55	E12F004B GA12F059B	O O	No Yes	17'-8'/16" <10'	Gate Globe	EM S	E E	M -	OP OP	CL OP	OP OP	AI AI	RM_C RM_C	Std. <0.25	2 2	Out -
P403	P403	GDC56	RHR C Pump Suction	Supp. Pool Wtr.	24	Yes	13	E12F105	O	No	20'-11'/16"	Gate	EM	E	M	OP	CL	OP	AI	RM_C	Std.	1	Out
P404	P104	GDC57	Chilled Water Supply	Water Water	6 6	Yes Yes	28(a) 28(a)	P50F060 P50F539	O I	No No	9'-6" NA	B'fly Chk	EM P	E P	M -	OP OP	OP OP	CL CL	AI -	B,C,RM_C Rev. Flow	30 -	1 -	In In
P405	P105	GDC57	Chilled Water Return	Water Water	6 6	Yes Yes	28(b) 28(b)	P50F150 P50F140	O I	No No	10'-3" NA	B'fly B'fly	EM EM	E E	M M	OP OP	OP OP	CL CL	AI AI	B,C,RM_C B,C,RM_C	30 30	1 2	Out Out
P406	P208	GDC57	Fire Protection Water	Water Water	4 4	No No	51 51	P54F726 P54F727	O I	Yes Yes	13'-3" NA	Gate Gate	M M	M M	- -	LC LC	LC LC	LC LC	- -	- -	- -	- -	In In
P407	P404	GDC56	RHR B Test and Pump Minimum Flow Line, RHR Steam Condensing Mode Bypass Line	Water Water Water Water	18 6 4 6	Yes Yes Yes Yes	17 17 17 17	E12F024B E12F046B E12F011B E12F064B	O O O O	No No No No	20'-3" NA 15'-9" 78'-0"	Gate Chk Globe Gate	EM P EM EM	E P E E	M - M M	CL CL CL OP	CL CL CL OP	CL CL CL OP	AI - AI AI	C,G,RM_C Rev. Flow C,G,RM_C RM_C	90 - Std. <8	- - 2 2	In In In In
P408	P405	GDC56	RHR C Test and Pump Minimum Flow Line	Water Water Water Water	18 6 6 6	Yes Yes Yes Yes	23 22 22 22	E12F021 E12F064C E12F046C E12F046C	O O O O	No No No No	18'-7-1/2" 97'-0" NA NA	Globe Gate Chk Chk	EM EM P P	E E P P	M M - -	CL OP CL CL	CL OP CL CL	CL OP CL CL	AI AI - -	C,G,RM_C RM_C Rev. Flow -	90 <8 - -	2 2 - -	In In In In
P409	P409	GDC56	HPCS Minimum Flow Line and Test Line to Suppression Pool	Water Water	12 12	Yes Yes	24 24	E22F023 E22F012	O O	No No	27'-9" 17'-0"	Globe Gate	EM EM	E E	M M	CL OP	CL OP	CL OP	AI AI	B,G,RM_C RM_C	Std. 5	3 3	In In
P410	P411	GDC55	HPCS to Reactor Pressure Vessel	Water Water	12 12	Yes Yes	9 9	E22V004 E22F005	O I	No No	22'-0" NA	Gate Chk	EM P	E (11)	M -	CL CL	CL CL	OP OP	AI -	RM_C Rev. Flow	27 -	3 -	In In
P411	P417	GDC55	LPCI C to Reactor	Water Water	12 12	Yes Yes	12 12	E12F042C E12F041C	O I	No No	22'-9" NA	Gate Chk	EM P	E (11)	- -	CL CL	CL CL	OP OP	AI AI	RM_C Rev. Flow	27 -	2 -	In In
P412	P418	GDC55	LPCI B to Reactor and RHR to Containment Spray and Containment Pool Cooling	Water Water Water Water Water	12 12 12 12 12	Yes Yes Yes Yes Yes	11 11 11 11 11	E12F027B E12F042B E12F041B E12F037B E12F028B	O I I I I	No No No No No	19'-3" NA NA NA NA	Gate Gate Chk Globe Gate	EM EM P EM EM	E E (11) E E	M M - M M	OP CL CL CL CL	OP CL CL OP CL	OP OP OP OP or CL OP	AI AI - AI AI	RM_C RM_C Rev. Flow A,M,O,RM_C RM_C	Std. 27 - Std. 60	2 2 - 2 2	In In In In In
P414	P410	GDC55	Feedwater B, RHR and RCIC Return to Reactor Pressure Vessel	Water Water Water Water Water Water Water Water	20 20 20 12 12 12 6 6	Yes Yes Yes Yes Yes Yes Yes Yes	2 2 2 2 2 2 2 2	B21F065B B21F032B N27F559B E12F050B E12F053B G33F052B G33F039	O O I O O O O	Yes Yes Yes Yes Yes Yes Yes	36'-6-1/4" NA NA NA 102'-9-1/4" NA 18'-1/4"	Gate Chk Chk Chk Globe Chk Gate	EM P P P EM P EM	E A[12] P P E P E	M - - - M - M	OP OP OP CL CL OP OP	CL CL CL CL CL OP OP	OP or CL OP or CL OP or CL CL CL CL CL	AI FC - - AI - AI	RM_C RM_C Rev. Flow Rev. Flow A,M,O,RM_C Rev. Flow B,F,R,L,W,Y,RM_C	Std. - - - Std. - 15	1 - - - 2 - 1	In In In In In In In

TABLE 6.2-32 (Continued)

Penetration Number (3) Unit 1	Unit 2	GDC/ Reg. Guide	System Name	Fluid	Line Size (in)	ESF Sys(4)	Fig. 6.2-60 Arr. No.	Sys. and Valve Number	Loc. (5)	Type C Test	Pipe Length(6)	Valve Type	Oper	Actuation Mode Pri	Actuation Mode Sec.	Valve Position Norm	Valve Position Shut down	Valve Position Post Acc.	Pwr. Fail(7)	Isolation Signal(8)	Closure Time(sec) (9)	Pwr Source If Sus(10)	Norm. Flow Dir.
P415 ✓	P415	GDC55	Main Steam Line D	Steam	26	Yes	1(a)	B21F028D	0	Yes	16'-5-7/8"	Globe	A	A	SP	OP	CL	CL	FC	C,D,E,F,S,N,P,RM_c	(13)	-	Out
				Steam	26	Yes	1(a)	B21F022D	I	Yes	NA	Globe	A	A	SP	OP	CL	CL	FC	C,D,E,F,S,N,P,RM_c	(13)	-	Out
				Steam	1-1/2	Yes	1(a)	B21F067D	0	Yes	23'-5-7/8"	Globe	EM	E	M	OP	CL	CL	AI	C,D,E,F,S,N,P,RM_c	Std.	1	Out
				Steam	1-1/2	Yes	1(a)	E32F001R	0	Yes	20'-5-7/8"	Gate	EM	E	M	CL	CL	CL	AI	RM_c*,U	Std.	1	Out
P416 ✓	P416	GDC55	Main Steam Line B	Steam	26	Yes	1(a)	B21F028B	0	Yes	17'-4-3/4"	Globe	A	A	SP	OP	CL	CL	FC	C,D,E,F,S,N,P,RM_c	(13)	-	Out
				Steam	26	Yes	1(a)	B21F022B	I	Yes	NA	Globe	A	A	SP	OP	CL	CL	FC	C,D,E,F,S,N,P,RM_c	(13)	-	Out
				Steam	1-1/2	Yes	1(a)	B21F067B	0	Yes	24'-4-3/4"	Globe	EM	E	M	OP	CL	CL	AI	C,D,E,F,S,N,P,RM_c	Std.	1	Out
				Steam	1-1/2	Yes	1(a)	E32F001E	0	Yes	21'-4-3/4"	Gate	EM	E	M	CL	CL	CL	AI	RM_c*,U	Std.	1	Out
P417	P128	GDC56	Drywell and Containment Equipment Drain Sump to Radwaste	Water	3	No	40	G61F080	0	Yes	26'-6"	Gate	EM	E	M	OP	OP	CL	AI	B,G,RM_c	Std.	1	Out
				Water	3	No	40	G61F075	I	Yes	NA	Gate	EM	E	M	OP	OP	CL	AI	B,G,RM_c	Std.	2	Out
P418	P127	GDC56	Drywell and Containment Floor Drain Sump to Radwaste	Water	3	No	43	G61F170	0	Yes	28'-1"	Gate	EM	E	M	OP	OP	CL	AI	B,G,RM_c	Std.	1	Out
				Water	3	No	43	G61F165	I	Yes	NA	Gate	EM	E	M	OP	OP	CL	AI	B,G,RM_c	Std.	2	Out
P419 ✓	P432	GDC55	RWCU Pump Discharge	Water	4	No	48	G33F056	0	Yes	10'-6"	Gate	EM	E	M	OP	OP	CL	AI	B,F,H,W,Y,RM_c	15	1	In
				Water	4	No	48	G33F053	I	Yes	NA	Gate	EM	E	M	OP	OP	CL	AI	B,F,H,W,Y,RM_c	15	2	In
P420 ✓	P412	GDC55	RWCU Backwash Transfer Pump to Radwaste	Water	4	No	46	G50F277	0	Yes	12'-0"	Gate	EM	E	M	OP	OP	CL	AI	B,G,RM_c	Std.	1	Out
				Water	4	No	46	G50F272	I	Yes	NA	Gate	EM	E	M	OP	OP	CL	AI	B,G,RM_c	Std.	2	Out
P421 ✓	P406	GDC55	RHR Reactor Shutdown Cooling Suction	Water	20	Yes	20	E12F008	0	Yes	14'-0"	Gate	EM	E	M	CL	OP	CL	AI	A,M,V,RM_a	<33	1	Out
				Water	20	Yes	20	E12F009	I	Yes	NA	Gate	EM	E	M	CL	OP	CL	AI	A,M,V,RM_a	<33	2	Out
				Water	3/4	Yes	20	E12F550	I	Yes	NA	Chk	P	P	-	CL	CL	CL	-	Rev. Flow	-	-	Out
P422 ✓	P407	GDC55	RHR and RCIC Steam Supply	Steam	10	Yes	1(c)	E51F063	I	Yes	NA	Gate	EM	E	M	CL	OP	Op or CL	AI	J,F,K,N,T,RM_a	10	2	Out
				Steam	10	Yes	1(c)	E51F064	0	Yes	13'-2"	Gate	EM	E	M	OP	OP	OP or CL	AI	J,F,K,N,T,RM_a	10	1	Out
				Steam	1	Yes	1(c)	E51F076	I	Yes	NA	Globe	EM	E	M	OP	CL	OP or CL	AI	J,F,K,N,T,RM_a	Std.	2	Out
P423	P129	GDC55	Main Steam Line Drain	Water	3	No	1(b)	B21F019	0	Yes	13'-0"	Gate	EM	E	M	OP	CL	CL	AI	C,D,E,F,S,N,P,RM_c	Std.	1	Out
				Water	3	No	1(b)	B21F016	I	Yes	NA	Gate	EM	E	M	OP	CL	CL	AI	C,D,E,F,S,N,P,RM_c	Std.	2	Out
P424 ✓	P420	GDC55	RWCU to Main Condenser and Radwaste	Water	4	No	14	G33F034	0	Yes	8'-6"	Gate	EM	E	M	CL	CL	CL	AI	B,F,H,W,Y,RM_c	15	1	Out
				Water	4	No	14	G33F028	I	Yes	NA	Gate	EM	E	M	CL	CL	CL	AI	B,F,H,W,Y,RM_c	15	2	Out
P425 ✓	P219	RG1.11	Combustible Gas Control Post Accident Hydrogen Analyzer	Cont. Atmos.	1/2	Yes	58(b)	M51F210A	0	Yes	<10'	Globe	S	E	-	CL	CL	OP	AI	RM_c	<0.25	1	Out
				Drywell Atm.	1/2	Yes	58(b)	M51F220A	0	Yes	<10'	Globe	S	E	-	CL	CL	OP	AI	RM_c	<0.25	1	Out
				Cont. Atmos.	1/2	Yes	58(b)	M51F230A	0	Yes	<10'	Globe	S	E	-	CL	CL	OP	AI	RM_c	<0.25	1	Out
				Cont. Atmos.	1/2	Yes	58(b)	M51F240A	0	Yes	<10'	Globe	S	E	-	CL	CL	OP	AI	RM_c	<0.25	1	Out
				Water	1/2	Yes	58(b)	M51F250A	0	Yes	<10'	Globe	S	E	-	CL	CL	OP	AI	RM_c	<0.25	1	In
			Suppression Pool Level	Cont. Atmos.	3/4	Yes	38(b)	023F050	0	Yes	<10'	Globe	S	E	-	OP	OP	OP	AI	RM_c	<0.25	1	-
P428	P109	GDC56	Containment Vacuum Relief	Cont. Atmos.	24	Yes	19	M17F035	0	Yes	2'-6"	B'fly	EM	E	M	OP	OP	CL	AI	B,G,X,RM_c	5	2	In
				Cont. Atmos.	24	Yes	19	M17F030	I	Yes	NA	Chk	P	Y	-	CL	CL	CL	-	Rev. Flow	-	-	In
P429 ✓	P419	GDC56	RHR Relief Line to Suppression Pool	Water	2	Yes	57	E12F025B	0	No	45'-6"	Rel	P	P	-	CL	CL	CL	-	-	-	-	In
				Water	2	Yes	57	E12F025C	0	No	39'-6"	Rel	P	P	-	CL	CL	CL	-	-	-	-	In
				Water	6	Yes	57	E12F055B	0	No	92'6"	Rel	P	P	-	CL	CL	CL	-	-	-	-	In
				Water	1-1/2	Yes	57	E12F103B	0	No	57'-9"	Chk	P	P	-	CL	CL	CL	-	Rev. Flow	-	-	In
				Water	1-1/2	Yes	57	E12F005	0	No	91'-9"	Rel	P	P	-	CL	CL	CL	-	-	-	-	In

TABLE 6.2-32 (Continued)

Penetration Number[3] Unit 1	Unit 2	GDC/ Reg. Guide	System Name	Fluid	Line Size (in)	ESF Sys[4]	Fig. 6.2-60 Arr. No.	Sys. and Valve Number	Loc.[5]	Type C Test	Pipe Length[6]	Valve Type	Oper	Actuation Mode Pri	Sec.	Valve Position Norm	Shut down	Post acc.	Pwr. Fail[7]	Isolation Signal[8]	Closure Time(sec)[9]	Per Source 1E Bus[10]	Norm. Flow Dir.
P411	P421	GDC56	RHR Heat Exchanger Vent to Suppression Pool	Noncondens.	1	Yes	45	E12F073B	O	No	12'-9"	Globe	EM	E	M	CL	CL	CL	AI	RX_C	Std.	2	In
				Noncondens.	1	Yes	45	E12F055BB	I	No	NA	Chk	P	P	-	CL	CL	CL	-	Rev. Flow	-	-	In
P433	P220	RG1.11	Containment/Drywell Pressure	Cont. Atmos.	3/4	Yes	38(b)	023F030A	O	Yes	<10'	Globe	S	E	-	OP	OP	OP	AI	RX_C	<0.25	1	-
				Cont. Atmos.	3/4	Yes	38(a)	023F040A	O	Yes	<10'	Globe	S	E	-	OP	OP	OP	AI	RX_C	<0.25	1	-
P434	P221	RG1.11	Suppression Pool Level Reference Leg	Cont. Atmos.	3/4	Yes	38(b)	023F[illegible]A	O	Yes	<10'	Globe	S	E	-	OP	OP	OP	AI	RX_C	<0.25	1	-
			Containment Pressure	Cont. Atmos.	3/4	Yes	38(b)	023F020A	O	Yes	<10'	Globe	S	E	-	OP	OP	OP	AI	RX_C	<0.25	1	-
			Containment Vacuum Relief	Cont. Atmos.	3/4	Yes	59	M17F055	O	Yes	<10'	Globe	S	E	-	OP	OP	OP	AI	RX_C	<0.25	1	-
P416	P416	GDC56	Containment Vacuum Relief	Cont. Atmos.	24	Yes	19	M17F065	O	Yes	2'-6"	B'fly	EM	E	M	OP	OP	CL	AI	B,G,X,RX_C	5	2	In
				Cont. Atmos.	24	Yes	19	M17F040	I	Yes	NA	Chk	P	V	-	CL	CL	CL	NA	Rev. Flow	-	-	In

TABLE 6.2-32 (Continued)

NOTES:

1. Through line leakage classification is discussed in Section 6.2.3.

2. Abbreviations used are as follows:

A - Air
ADS - Automatic depressurization system
AI - As is
B'fly - Butterfly valve
Chk - Check valve
CL - Closed
E - Electric
EH - Electrohydraulic
EM - Electric motor
FC - Fail Closed
H - Hydraulic
HPCS - High pressure core spray system
LC - Locked closed
LPCI - Low pressure coolant injection system
LPCS - Low pressure core spray system
M - Manual
NA - Not applicable
OP - Open
P - Process fluid
RCIC - Reactor core isolation cooling system
Rel - Relief valve
RHR - Residual heat removal system
RWCU - Reactor water cleanup system
S - Solenoid
SP - Spring
V - Vacuum in containment

3. Penetrations not listed are spares and are capped, except penetrations P202 (Unit 1)/P306 (Unit 2), P305/P205, and P311/P215, which are the equipment hatch and personnel airlocks.

4. ^Engineered safety feature systems ~~includes support systems required for shutdown~~ Essential Systems are which are required for shutdown. In addition asterisk(s) items are non-ESF systems that would be desirable to use to mediate the consequence of an accident. RAP

5. Location inside (I) or outside (O) of containment.

6. Length of pipe from containment to outermost isolation valve.

7. All motor operated isolation valves remain in last position upon failure of valve power. All air operated valves close upon loss of motive air, except as indicated by Note 12, below.

8. Remote manual (RM) valves can be opened or closed by remote manual switch operation during any mode of reactor operation, except when an automatic signal is present. Remote manual valves have two sets of position indicator lights, one set at the remote manual switch, the other set at the control room isolation status panel. Isolation signals are defined as follows:

NOTES (Cont'd)

Signal	Description
A	Reactor vessel low water level - level 3. (A scram occurs at this level. This is the highest of the three isolation low water level signals.)
B	Reactor vessel low water level - level 2. (This is the second of the three low water level signals. The reactor core isolation cooling and high pressure core spray systems are activated at this level.)
C	Reactor vessel low water level - level 1. (This is the lowest of the three water level signals. Main steam line isolation occurs at this level. The low pressure core spray and low pressure coolant injection systems are also activated at this level.)
D	High radiation - main steam line.
E	Line break - main steam line (steam line high steam flow).
F	Line break - main steam line (steam line high space temperature).
G	High drywell pressure.
H	Line break in reactor water cleanup system (high space temperature).
J	Line break in reactor core isolation cooling system steam line to turbine (low steam line pressure).
K	Line break in reactor core isolation cooling system steam line to turbine (high steam line space temperature, or high steam flow).
L	High differential flow in the reactor water cleanup system.
M	Line break in residual heat removal shutdown and head cooling (high space temperature).
N	Low main condenser vacuum.
P	Low main steam line pressure at inlet to turbine (RUN mode, only).
S	High main steam line temperature, turbine building.

NOTES (Cont'd)

Signal	Description
T	High pressure reactor isolation cooling turbine exhaust diaphragm.
U	High reactor vessel pressure - close residual heat removal - shutdown cooling valves and head cooling valves.
V	Low reactor vessel pressure.
W	High temperature at outlet of cleanup system nonregenerative heat exchanger.
X	Containment to atmosphere differential pressure greater than 0.0 psid.
Y	Standby liquid control system actuated.
Z	High radiation, containment and drywell ventilation exhaust.
RM_c	Remote manual switch from control room. (All automatically actuated containment isolation valves are capable of remote operation from the control room.)
RM_c*	Valve does not have an individual valve remote manual control switch, but uses a "system initiate" remote control switch which controls the valve as well as other functions.
RM_s	Remote manual switch from shutdown panel. (Provided in addition to RM_c, noted above, on selected valves as indicated.)

9. Standard (Std.) closure time, based upon nominal pipe diameter, is approximately 12 inches/min for gate valves and approximately 4 inches/min for globe valves. The standard closure time for butterfly valves is 30 to 60 seconds.

10. A-C motor operated valves required for isolation functions are powered from the a-c standby power buses. D-C operated isolation valves are powered from the batteries.

11. Testable check valves are designed for remote opening with zero differential pressure across the valve seat. The valves close under reverse flow conditions, even if the test switch is positioned to open. The valves open when pump pressure exceeds reactor pressure, even if the test switch is positioned to close.

12. Air operated check valves are only air closed. These valves act as simple check valves upon loss of air.

NOTES (Cont'd)

13. Main steam line isolation valves require that both solenoid pilots be de-energized to close. Accumulator air pressure plus spring act to close valves when both pilots are de-energized. Voltage failure at only one pilot does not cause valve closure. These valves are designed to close fully in 3 to 5 seconds (see Section 5.4.5.3).

14. Inside personnel airlock.

15. During reactor operation, a blind flange is installed on the outboard end of the transfer tube as the containment boundary.