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Robert L. Mittl General Manager
Nuclear Assurance and Regulation

August 28, 1984

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, Maryland 20814

Attention: Mr. Albert Schwencer, Chief
Licensing Branch 2
Division of Licensing

Gentlemen:

HOPE CREEK GENERATING STATION
DOCKET NO. 50-354
CONTAINMENT ISOLATION

Pursuant to discussions with L. Ruth, Containment Systems Branch, on July 2 and 12, 1984, FSAR Sections 1.10 and 6.2, Tables 1.11-1, 6.2-16 and 6.2-25, Figures 5.4-8, 6.2-28 and 6.2-45, and Question 480.14 have been revised and are attached for your use. These changes will be incorporated into Amendment 8.

Very truly yours,

R L Mittl /DEC

JES:gs
Attachment

C D. H. Wagner
USNRC Licensing Program Manager

W. H. Bateman
USNRC Senior Resident Inspector

B001
1/1

Response

Essential systems are those critical to the immediate mitigation of the consequences of a LOCA. Also identified as essential are those systems that could be useful, although not critical, in mitigating an accident that results in containment isolation. Essential systems are not automatically isolated by accident signals.

Nonessential systems are those that are not required or used in the mitigation of an accident that results in containment isolation. All nonessential systems are automatically isolated by the containment isolation signal, ~~and cannot be reopened by the operator while the accident signal is still present.~~ Insert A

Essential and nonessential systems are identified in Table 6.2-16.

Diverse parameters are sensed for the initiation of automatic isolation of nonessential systems penetrating primary containment. See Section 6.2.4 for a discussion of containment isolation signal sensed parameter diversity.

As required for post-accident situations, each nonessential penetration, except instrument lines, has two isolation barriers in series that meet the requirements of GDC 54, 55, 56, or 57, as clarified by SRP Section 6.2.4. Isolation is automatic with no credit taken for operator action. All manual valves are sealed closed so as to qualify as an isolation barrier. Each automatic isolation valve in a nonessential penetration receives independent isolation signals, derived from diverse parameters.

The design of the controls for automatic containment isolation are such that the resetting of the isolation signals will not result in the automatic reopening of containment isolation valves. Reopening of containment isolation valves will require deliberate operator action on a valve-by-valve basis. Ganged reopening of containment isolation valves is not used. Isolation valves in the RHR process sampling line, reactor water sample line, HPCI and RCIC suction and steam supply line, and the TIP system ball valve are being modified to reflect this criteria. These modifications will be incorporated into the HCGS design prior to fuel load

The primary containment isolation logic setpoint pressure is 2.0 psig. This pressure is far enough above the maximum expected pressure inside containment during normal operation that inadvertent containment isolation does not occur during normal operation from instrument drift fluctuations due to the accuracy of the pressure sensor.

with the exception of the systems discussed below:

a. Reactor Water Cleanup (RWCU) System Return - Automatic isolation of Valve AE-V021 (AE-HV-F039) is not provided because there are two check valves at the containment boundary providing primary containment isolation for the feedwater system. These valves will provide immediate isolation without actuation of the motor-operated valve by an isolation signal. Valve AE-V021 is a motor-operated check valve that closes on back flow and is capable of being manually closed from the main control room.

b. Bypass Lines Around the Testable Check Valves On the RHR and Core Spray Systems - The valves in the 1-inch bypass lines are not automatically isolated because they are normally closed, fail-closed valves, that are only operated to equalize pressures to permit testing of the check valves. The valves are opened by an operator holding a momentary pushbutton switch in the open position. Release of the switch by the operator will return the valves to the closed position.

c. Warmup Lines Around the Inboard HPCI and RCIC Steam Line Isolation Valves - Automatic isolation of these valves is not provided because they are in essential systems and are not required to perform a containment isolation function when the RCIC and HPCI systems are in operation.

. Non-Condensible Gas Vent from the RHR Heat Exchangers - The valves on the vent line between the RHR heat exchangers and the suppression chamber (BC-HV-F104A,B and BC-HV-F105A,B) are not automatically isolated because they are normally closed and are only opened during the RHR steam condensing mode of operation. The vent lines connect the RHR heat exchanger to the suppression pool. The RHR heat exchanger is part of an ECCS system and immediate isolation is not required if the valves were open at the time of requirement to isolate containment.

Reopening of primary containment isolation valves requires deliberate operator action on a valve-by-valve basis. Valves with manual override capabilities are identified in Table 6.2-16.

SRP Section	Specific SRP Acceptance Criteria	Summary Description of Differences	FSAR Section(s) Where Discussed
6.2.3 (Rev 2)	II.3.e The external design pressure of the secondary containment structure should provide an adequate margin above the maximum expected external pressure.	The secondary containment for tornado depressurization is not designed with any margin above the maximum expected external pressure as stated in Regulatory Guide 1.76.	6.2.3.6
6.2.4 (Rev 2)	II.6.g Relief valves used as isolation valves should have a relief setpoint greater than 1.5 times the containment design pressure.	Relief valve setpoint is not greater than 1.5 times the containment design pressure.	6.2.4.5
	II.6.d Valve nearest the containment and piping between the containment and the first valve, when both valves are located outside primary containment, should be enclosed in a leak-tight or controlled leakage housing.	An enclosure or leak-tight housing has not been designed.	6.2.4.5
Insert B →			
6.2.5 (Rev 2)	II.4 Following a LOCA, repressurization of the containment should be limited to less than 50% of containment design pressure.	Pressure increase due to main steam isolation valve (MSIV) inleakage after a LOCA will result in repressurization of more than 50% of the containment design pressure.	6.2.5.7
6.5.1 (Rev 2)	II Design of instrumentation for ESF atmosphere cleanup systems to the guidelines of Regularory Guide 1.52 and to the recommendations of ANSI N509 as summaried in SRP Table 6.5.1-1.	Compliance with the minimum instrumentation requirements for the CREF system are discussed in Table 6.5-4 and for the FRVS systems in Table 6.8-5	6.5.1.2

II.6.h

All nonessential systems penetrating primary containment must be automatically isolated by the containment isolation signal.

There are ____ valves in nonessential portions of systems where automatic isolation is not provided

1.10/6.2.4.5

water seal for at least 30 days. The ECCS and RCIC jockey pumps can be used to maintain pressure and to provide makeup or to fill up the feedwater system piping in the ~~unlikely~~ event that ~~a line break occurs downstream of the check valves inside the primary containment.~~ it is necessary.

b. Deleted

c. High pressure coolant injection (HPCI) turbine steam supply - The drain pot line is maintained full of water by condensation on the turbine steam supply line.

d. Chilled water from and to drywell coolers - The lines in the reactor building are seismically analyzed with a vertical rise from the containment penetration of approximately 8 feet.

e. RWCU supply - The lines in the primary containment are Seismic Category I and form a loop whose vertical leg is approximately 49 feet.

f. RCIC turbine steam supply - This is similar to b. above.

g. Main steam line drain - The line to the isolation valve is Seismic Category I. Steam would condense in the line and form a water seal during normal operation. Closure of the inboard and outboard isolation valves upon receipt of a containment isolation signal and the water seal provide a barrier to bypass leakage.

h. Drywell floor drain and drywell equipment drain sump discharges - The lines to the isolation valves are Seismic Category I, and the sump water acts as an effective water seal.

i. Reactor auxiliaries coolant system (RACS) supply and return - There are seismically analyzed lines in the auxiliary building, with a vertical leg approximately 6-feet long that forms a water seal.

j. Deleted

in addition to the third isolation valve, there are isolation valves on the high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) discharge lines, and on the reactor water cleanup system (RWCU) return lines that connect to the feedwater lines between the outside containment isolation valves and the third isolation valves. Those isolation valves can be closed by operator action from the main control room.

See Section 5.4.9 for a further discussion of the design of the main steam lines and the feedwater lines.

6.2.4.3.1.3 Residual Heat Removal Shutdown Cooling Suction Line

The residual heat removal (RHR) shutdown cooling suction line penetrates primary containment and taps into one of the two recirculation loops. Isolation is provided by two normally closed motor-operated gate valves, which are maintained closed by a containment isolation signal. One containment isolation valve is located inside primary containment, and the second valve is located outside primary containment. ~~This design is conservative since it does not take credit for the RHR system being a closed system outside primary containment.~~

6.2.4.3.1.4 Residual Heat Removal Shutdown Cooling Return Lines

The RHR shutdown cooling return (connect to) lines penetrate the primary containment and ~~discharge into~~ (is ~~are~~ connected to) the discharge side of each recirculation loop, which ~~injects directly into~~ (connect to) the RPV. Each line is isolated by a single, normally closed, motor-operated primary containment isolation valve ~~that receives a containment isolation signal.~~ outside primary containment and by a testable check valve inside primary containment. The motor-operated valves are interlocked closed by a reactor high pressure signal during normal operation and are maintained closed during an accident by a low water level isolation signal.

~~Use of a single containment isolation valve is justified on the basis that the RHR system meets the requirements of a closed system outside primary containment. The RHR system is maintained in a leak-tight condition during normal operation by the use of a jockey pump system and by pump room flooding alarms and periodic visual inspection.~~

Each testable check valve is ~~proved~~ provided with a bypass line for testing purposes. These lines are isolated by an air-operated fail closed globe valve. JAT

6.2.4.3.1.5 Residual Heat Removal Low Pressure Coolant Injection and Core Spray Discharge Lines

The RHR low pressure coolant injection (LPCI) and the core spray discharge lines penetrate the primary containment and discharge directly into the RPV. Each line is isolated by a ~~single~~, outside primary normally closed, motor-operated containment isolation valve ~~that does not receive a~~ containment, ~~isolation signal.~~ and a testable check valve inside primary containment.

3

~~Use of a single containment isolation valve is justified on the basis that both RHR and core spray meet the requirements of a closed system outside of primary containment. Automatic isolation is not provided because greater safety is ensured by initiating a cooling water supply to the reactor.~~

In addition, there is a HPCI line which discharges into the RPV by way of one of the two core spray lines downstream of the containment isolation valve on that core spray line. This line is isolated by a normally closed motor-operated gate valve outside primary containment. ~~Use of a single isolation valve is again justified on the basis that the HPCI system is a closed system outside primary containment. Automatic isolation is not provided because greater safety is ensured by initiating a cooling water supply to the reactor.~~ This motor-operated valve, in series with the testable check valve on the core spray line, provides the ~~second~~ redundant isolation barrie

6.2.4.3.1.6 High Pressure Coolant Injection and Reactor Core Isolation Cooling Steam Supply Lines

The high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) steam supply lines have two major containment isolation valves in series that are normally open, located inside and outside of the primary containment. The third containment isolation valve on these lines is a 2-inch, normally closed globe valve, on a 1-inch bypass line around the inside major containment isolation valve. These valves do not receive a containment isolation signal when a LOCA is detected. This permits these ESF systems to function during a LOCA. However, these valves automatically close when a break is detected in the portion of the steam supply line outside primary containment of the respective system.

6.2.4.3.1.7 Reactor Water Cleanup System Line

Reactor water processed through the RWCU system is taken out of containment from the reactor recirculation loops. The RWCU line

Each testable check valve is provided with a bypass line for testing purposes. These lines are isolated by an air-operated, fail-closed, globe valve.

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outside primary containment that closes on a containment isolation signal.

6.2.4.3.1.13 Post-Accident Liquid Sampling System

There are seven post-accident sampling lines that penetrate the primary containment. Only one of the seven forms part of the RCPB as well. See Section 6.2.4.3.2.16 for a discussion of the containment isolation provisions for these lines.

6.2.4.3.1.14 Instrument Lines

The instrument lines that penetrate the primary containment and form part of the RCPB are designed to optimize their monitoring function and to minimize uncontrolled releases of radioactivity to the environment. These instrument lines have a flow restriction orifice inside the primary containment and an excess flow check valve outside the primary containment for automatic containment isolation in the event of an instrument line break. If an instrument line develops a leak of 1.5 to 2.5 gpm outside containment, the resultant differential pressure of 3 to 10 psi across the excess flow check valve will cause the check valve to close automatically. If an excess flow check valve fails to close when required, the restriction orifice and the main flow path through the valve have a resistance to flow at least equivalent to a sharp-edged orifice of 0.250 inches in diameter. Each valve is also provided with two limit switches that operate lights that indicate valve position and a solenoid valve for remote reset. The capability for remote operation has not been provided since there is no remote indication of failure of a specific line.

Insert D&E

6.2.4.3.1.~~15~~ 16 Conclusion on GDC 55

To ensure protection against the consequences of accidents involving the release of radioactive material, piping systems that form the RCPB are shown to have adequate isolation capabilities on a case-by-case basis. In all cases, a minimum of two barriers are shown to protect against the release of radioactive materials.

In addition to meeting the isolation requirements stated in GDC 55, the pressure-retaining components that comprise the RCPB are designed to meet other requirements that minimize the be reliable boundaries against containment leakage, and that the system is maintained by visually checking for leaks during normal instrument calibrations.

The instrument lines that sense suppression pool water level have a remote manual valve for isolation. Their design is justified on the "other defined basis" because system reliability is greater with a single isolation valve and because these systems are closed systems outside containment that can accommodate a single failure without loss of system reliability as a boundary against containment leakage.

6.2.4.3.2.22 Conclusion on GDC 56

To ensure protection against the consequences of accidents involving release of significant amounts of radioactive materials, fluid lines that penetrate the primary containment have been demonstrated to provide isolation capabilities on a case-by-case basis in accordance with GDC 56.

In addition to meeting isolation requirements, the pressure-retaining components of these systems are designed to the same quality standards as the containment.

6.2.4.3.3 Evaluation Against GDC 57

6.2.4.3.3.1 Chilled Water System Lines and Reactor Auxiliaries Cooling System Lines

The chilled water and the reactor auxiliaries cooling system (RACS) lines are closed systems inside primary containment. However, greater safety is achieved by meeting the requirements of GDC 56. Therefore, two redundant motor-operated isolation valves that isolate on a containment isolation signal, one inside and one outside primary containment, are provided.

6.2.4.3.1.15 Insert D

~~6.2.4.3.3.2~~ Control Rod Drive Lines

The CRD system has multiple, insert and withdraw lines, that penetrate the primary containment.

Insert D Cont'd

The classification of these lines is quality group B, and they are designed in accordance with ASME B&PV Code, Section III, Class 2. The basis upon which the CRD insert and withdraw lines are designed is commensurate with the safety importance of maintaining the pressure integrity of these lines.

It has been an accepted practice not to provide automatic isolation valves for the CRD insert and withdraw lines in order to preclude any possible failure of the scram function. The lines can be isolated by the solenoid valves provided on the hydraulic control units (HCUs) that are located outside the primary containment. The lines that extend outside the primary containment are 1 inch or smaller and terminate in systems that are designed to prevent outleakage. The solenoid valves are normally closed, but they open upon rod movement and during reactor scram. In addition, a ball check valve located in the CRD flange housing automatically seals the insert line if there is a break. Finally, manual shutoff valves are provided outside the primary containment.

6.2.4.3.3.2 Deleted

6.2.4.3.4 Evaluation Against Regulatory Guides

6.2.4.3.4.1 Evaluation Against Regulatory Guide 1.11 (Safety Guide 11)

Compliance with Regulatory Guide 1.11 (Safety Guide 11) is discussed in Section 1.8.11.

6.2.4.3.4.2 Evaluation Against Regulatory Guide 1.141

Compliance with Regulatory Guide 1.141 is discussed in Section 1.8.1.141.

Regulatory Guide 1.141 is not a requirement for HCGS. However, our assessment is that the other defined bases for complying with GDC 54, 55, 56, and 57 that were implemented on HCGS meet Regulatory Guide 1.141 requirements.

6.2.4.3.4.3 Failure Mode and Effects Analyses

A single failure can be defined as a failure of a component in any safety system that results in a loss or reduction of the

Insert E

\# Because of the unique function and features of the CRD system, the previously described design constitutes an acceptable "other defined basis" for containment isolation as recognized by the NRC in the Federal Register (48 FR 23809).

system's capability to perform its safety function. Active mechanical components are defined in Regulatory Guide 1.48 as components that must perform a mechanical motion during the course of accomplishing a system safety function. Appendix A to 10 CRF 50 requires that electrical systems be designed against passive single failures as well as active single failures. Sections 3.1 and 15.9 describe the implementation of these requirements as well as the requirements of GDC 17, 21, 35, 41, 44, 54, 55, 56, and 57.

6.2.4.3.5 Evaluation of Other Defined Bases

When the reliability of an ESF system is increased by using only one containment isolation valve, a closed system outside primary containment is used as a second isolation barrier to accommodate a single active failure. In the case of a single failure, the closed system accommodates the failure by being an extention of the containment. Table 6.2-28 identifies those penetrations isolated with only a single isolation valve. Figures 6.2-45, 6.2-46, 6.2-47, and 6.2-48 show the limits of the extended containment boundary. All manual valves at the system boundary, vent valves, test valves, and drain valves, are under administrative control to assure the integrity of the extended containment boundary. Isolation provisions for the extended containment boundaries are identified in Table 6.2-27. Table 6.2-[illegible] also evaluates the ability of check valves and safety/relief valves to maintain the extended containment boundary. All extended containment boundaries are Quality Group B (i.e. ASME B&PV Code Class 2 piping), Seismic Category I, and designed to temperature and pressure ratings at least equal to that of the containment as identified in Figures 6.2-45 through 6.2-48.

25 26 locked closed and

Missile protection for plant systems and structures is discussed in Section 3.5.

6.2.4.3.5.1 Conclusion on Other Defined Bases

When greater safety is ensured by using a single primary containment isolation valve, a dependable closed system outside primary containment is provided to act as a second barrier against the release of radioactive materials.

setpoint is greater than 1.5 times the containment design pressure.

For relief valve PSV-F097, shown on Figure 5.4-13, the relief setpoint is less than 1.5 times the containment design pressure. Nevertheless, this is acceptable since valve F097 discharges into the suppression pool. Any increase in valve backpressure due to an increase in suppression chamber pressure resulting from an accident will tend to better seat the valve, thus enhancing its containment isolation capabilities.

Insert C

6.2.5 COMBUSTIBLE GAS CONTROL IN CONTAINMENT

Following a postulated loss-of-coolant accident (LOCA), hydrogen gas may be generated within the primary containment as a result of the following processes:

a. Metal-water reaction involving the Zircaloy fuel cladding and the reactor coolant

b. Radiolytic decomposition of water in the reactor vessel and the suppression pool (oxygen also evolves in this process)

c. Corrosion of metals and paints in the primary containment.

To preclude the possibility of a combustible mixture of hydrogen and oxygen accumulating in the primary containment, the containment atmosphere is inerted with nitrogen gas before power operation of the reactor.

To ensure that the hydrogen and oxygen concentration in the primary containment is maintained below the lower flammability limit given in Regulatory Guide 1.7, the following features are provided:

a. A containment hydrogen recombiner system

b. A hydrogen/oxygen analyzer system (HOAS)

Insert C

6.2.4.5.3 Acceptance Criterion II.6.h

Acceptance Criterion II.6.h of Section 6.2.4 requires that nonessential systems be automatically isolated by the containment isolation signal. HCGS complies with this requirement, with the exceptions that are identified and justified in our response to NUREG-0737, Item II.E.4.2 in Section 1.10.

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration No.	Line Isolated	Fluid	Line Size, In.	NRC General Design Criterion	ESF System	Valve Number and/or Orifice Plate	Valve Type	Valve Location	Valve Arrangement	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Mode of Operation	Secondary Method of Actuation	Normal Valve Position	Shutdown Valve Position	Post-Accident Position	Power Failure Valve Position	Containment Isolation Signal	Valve Closure Time	[illegible]	Remarks
PROCESS LINE PENETRATIONS																					
P-1A	Main Steam	Steam/ Water	26 26 2 2	[illegible]	No	[illegible]	[illegible]	Inside Outside Outside Outside	[illegible]	[illegible]	- [illegible] [illegible] [illegible]	Instr. gas Compr. air AC motor AC motor	Spring / Manual Spring / Manual Manual Manual	[illegible]	C C C [illegible]	C C C C	C C [illegible] [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P-1B	Main Steam	Steam/ Water	[illegible]	[illegible]	No	[illegible]	[illegible]	Inside Outside Outside Outside	[illegible]	[illegible]	- [illegible] [illegible] [illegible]	Instr. gas Compr. air AC motor AC motor	Spring / Manual Spring / Manual Manual Manual	[illegible]	C C C [illegible]	C C C C	C C [illegible] [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P-1C	Main Steam	Steam/ Water	[illegible]	[illegible]	No	[illegible]	[illegible]	Inside Outside Outside Outside	[illegible]	[illegible]	- [illegible] [illegible] [illegible]	Instr. gas Compr. air AC motor AC motor	Spring / Manual Spring / Manual Manual Manual	[illegible]	C C C [illegible]	C C C C	C C [illegible] [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P-1D	Main Steam	Steam/ Water	[illegible]	[illegible]	No	[illegible]	[illegible]	Inside Outside Outside Outside	[illegible]	[illegible]	- [illegible] [illegible] [illegible]	Instr. gas Compr. air AC motor AC motor	Spring / Manual Spring / Manual Manual Manual	[illegible]	C C C F/O	C C C C	C C [illegible] [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P-2A	Feedwater	Water	[illegible]	[illegible]	No	[illegible]	[illegible]	Inside Outside Outside Outside Outside	[illegible]	[illegible]	- [illegible] [illegible] [illegible] [illegible]	Flow Flow Flow DC motor Flow	None Compr. air (17) AC motor (18) Manual AC motor (18)	[illegible]	C C C C C	C C C [illegible] C	[illegible] C C [illegible] C	None None None None	[illegible]	[illegible]	[illegible]
P-2B	Feedwater	Water	[illegible]	[illegible]	No	[illegible]	[illegible]	Inside Outside Outside Outside Outside	[illegible]	[illegible]	[illegible]	Flow Flow Flow DC motor Flow	None Compr. air (17) AC motor (18) Manual AC motor (13)	[illegible]	C C C C C	C C C [illegible] C	[illegible] C C [illegible] C	None None None None	[illegible]	[illegible]	[illegible]
P-3	RHR Shutdown Cooling Suction	Water	[illegible]	[illegible]	Yes	[illegible]	[illegible]	Inside Outside	[illegible]	Yes Yes	[illegible]	AC motor AC motor	Manual Manual	C C	[illegible]	C C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P-4A	RHR Shutdown Cooling Return	Water	[illegible]	[illegible]	Yes	[illegible]	[illegible]	Outside	[illegible]	Yes	[illegible]	AC motor	Manual	C	[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P-4B	RHR Shutdown Cooling Return	Water	[illegible]	[illegible]	Yes	[illegible]	[illegible]	Outside	[illegible]	Yes	[illegible]	AC motor	Manual	C	[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P-5A	Core Spray To Reactor	Water	[illegible]	[illegible]	Yes	[illegible]	[illegible]	Outside	[illegible]	Yes	[illegible]	AC motor	Manual	C	[illegible]	[illegible]	[illegible]	None	[illegible]	[illegible]	[illegible]
P-5B	Core Spray To Reactor	Water	[illegible]	[illegible]	Yes	[illegible]	[illegible]	Outside Outside	[illegible]	Yes Yes	[illegible]	AC motor AC motor	Manual Manual	C C	[illegible]	[illegible]	[illegible]	None None	[illegible]	[illegible]	[illegible]

Part A

[illegible]

Insert A

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, In.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) Fig(8)	Type C Test	Length of Pipe from Cont. to Outside Valves, Ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(4)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time,s	Power Source(6)	Remarks(7)
P-3	RHR Shutdown Cooling Suction	Water	20	55	Yes	BC-V071	GT	Inside	3/C	Yes	-	AC Motor	Manual	C	O	C	AS IS	J	30	A	b,S
			1			BC-RV-4425	RV	Inside		Yes	-	Pressure	None	C	C	C	NA	-	NA	NA	S,E
			20			BC-V164	GT	Outside		Yes	0.6	AC Motor	Manual	C	O	C	AS IS	J	30	D	b,S
P-4A	RHR Shutdown Cooling Return	Water	12	55	Yes	BC-V017	CK	Inside	4/D	Yes	-	Flow	None(6)	C	O	C	NA	-	NA	NA	[illegible]
			1			BC-V118	GB	Inside		Yes	-	Instr Gas	Manual	C	C	C	C	None	10	B	[illegible]
			12			BC-V013	GB	Outside		Yes	0.0	AC Motor	Manual	C	O	C	AS IS	J	30	D	[illegible]
P-4B	RHR Shutdown Cooling Return	Water	12	55	Yes	BC-V111	CK	Inside	4/D	Yes	-	Flow	None(6)	C	O	C	NA	-	NA	NA	[illegible]
			1			BC-V117	GB	Inside		Yes	-	Instr Gas	Manual	C	C	C	C	None	10	B	[illegible]
			12			BC-V110	GB	Outside		Yes	0.0	AC Motor	Manual	C	C	C	AS IS	J	30	D	[illegible]
P-5A	Core Spray To Reactor	Water	12	55	Yes	BE-V002	CK	Inside	5/E	Yes	-	Flow	None(6)	C	C	O	NA	-	NA	NA	[illegible]
			1			BE-V072	GB	Inside		Yes	-	Instr Gas	Manual	C	C	C	C	None	10	B	[illegible]
			12			BE-V003	GT	Outside		Yes	0.0	AC Motor	Manual	C	C	O	AS IS	None	12	B	b,X
P-5B	Core Spray To Reactor	Water	12	55	Yes	BE-V006	CK	Inside	5/E	Yes	-	Flow	None(6)	C	C	O	NA	-	NA	NA	[illegible]
			1			BE-V071	GB	Inside		Yes	-	Instr Gas	Manual	C	C	C	C	None	10	A	[illegible]
			12			BE-V007	GT	Outside		Yes	1.8	AC Motor	Manual	C	C	O	AS IS	None	12	A	b,X
			14			BJ-V001	GT	Outside		Yes	4.6	DC Motor	Manual	C	C	O	AS IS	None	20	A	[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

—Insert C

—Insert B

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	GDC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Piece	Valve Type(1)	Valve Location	Valve Arrangement(2) Fig/P&ID	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation(3a)	Normal Valve Position(4)	Shutdown Valve Position(4)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s.	Power Source(6)	Remarks(7)
P-6A	LPCI	Water	[illegible]	[illegible]	Yes	[illegible]	[illegible]	Outside	[illegible]	Yes	0.0	AC motor	Manual	C	O	O	AS IS	None	[illegible]	[illegible]	[illegible]
P-6B	LPCI	Water	12	56	Yes	[illegible]	[illegible]	Outside	[illegible]	Yes	0.0	AC motor	Manual	C	O	O	AS IS	None	[illegible]	[illegible]	[illegible]
P-6C	LPCI	Water	12	56	Yes	[illegible]	[illegible]	Outside	[illegible]	Yes	0.0	AC motor	Manual	C	O	O	AS IS	None	[illegible]	[illegible]	[illegible]
P-6D	LPCI	Water	12	56	Yes	[illegible]	[illegible]	Outside	[illegible]	Yes	0.0	AC motor	Manual	C	O	O	AS IS	None	[illegible]	[illegible]	[illegible]
P-7	HPCI Turbine Steam Supply	Steam	[illegible]	[illegible]	Yes	[illegible]	[illegible]	Inside Outside Inside	[illegible]	Yes Yes Yes	- 0.0 -	AC motor AC motor AC motor	None (Manual) Manual None (Manual)	O O C	C C C	O O C	AS IS AS IS AS IS	None None None	[illegible]	[illegible]	[illegible]
P-8A	Chilled Water from Drywell Coolers	Water	[illegible]	56	No	[illegible]	[illegible]	Inside Outside	[illegible]	Yes Yes	- 1.5	AC motor AC motor	None (Manual) Manual	O O	C C	C C	AS IS AS IS	[illegible]	[illegible]	[illegible]	[illegible]
P-8B	Chilled Water to Drywell Coolers	Water	[illegible]	56	No	[illegible]	[illegible]	Inside Outside	[illegible]	Yes Yes	- 0.0	AC motor AC motor	None (Manual) Manual	O O	C C	C C	AS IS AS IS	[illegible]	[illegible]	[illegible]	[illegible]
P-9	[illegible] Supply	Water	[illegible]	[illegible]	No	[illegible]	[illegible]	Inside Outside	[illegible]	Yes Yes	- 0.0	AC motor AC motor	None (Manual) Manual	O O	C C	C C	AS IS AS IS	[illegible]	[illegible]	[illegible]	[illegible]
P-10	RHR Head Spray	Water	[illegible]	[illegible]	No	[illegible]	[illegible]	Inside Outside	[illegible]	Yes Yes	- [illegible]	AC motor AC motor	None (Manual) Manual	C C	C C	C C	AS IS AS IS	[illegible]	[illegible]	[illegible]	[illegible]
P-11	RCIC Turbine Steam Supply	Steam	[illegible]	[illegible]	No	[illegible]	[illegible]	Inside Outside Inside	[illegible]	Yes Yes Yes	- 1.0 -	AC motor AC motor AC motor	None (Manual) Manual None (Manual)	O O C	C C C	O O C	AS IS AS IS AS IS	None None None	[illegible]	[illegible]	[illegible]
P-12	Main Steam Drain	Steam/Water	[illegible]	[illegible]	No	[illegible]	[illegible]	Inside Outside	[illegible]	Yes Yes	- 0.5	AC motor AC motor	None (Manual) Manual	O O	C C	C C	AS IS AS IS	[illegible]	[illegible]	[illegible]	[illegible]
P-13	Spare																				[illegible]
P-14	Not used																				[illegible]
P-15	Spare																				[illegible]
P-16	Spare																				[illegible]
P-17	Reactor Recirc Water Sample	Water	3/4 3/4	56	No	[illegible]	[illegible]	Inside Outside	[illegible]	Yes Yes	- 12.2	AC solenoid AC solenoid	None (Manual) Manual	C C	C C	C C	C C	[illegible]	[illegible]	[illegible]	[illegible]
P-18	Standby Liquid Control	Sodium pentaborate solution	1 1/2 1 1/2 1 1/2	56	Yes	[illegible]	[illegible]	Inside Outside Outside	[illegible]	Yes Yes Yes	- 12.6 10.5	Flow Flow Flow	None AC Motor (13) AC Motor (13)	C O O	C C C	C O O	[illegible] C C	- None None	[illegible]	[illegible]	[illegible]

Amendment [illegible]

[illegible]

Insert B

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size In.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) (Figure)	Type C Test	Length of Pipe from Cont. to Outside Valve, Ft.	Primary Method of Actuation(1)	Secondary Method of Actuation	Normal Valve Position(1)	Shutdown Valve Position(1)	Post-Accident Position(1)	Power Failure Valve Position	Containment Isolation Signal(1)	Valve Closure Time s	Power Source(1)	Remarks(1)
P-6A	LPI	Water	12	56	Yes	DC-V005	CK	Inside	S/D	Yes	-	Flow	None (k)	C	C	O	NA	-	NA	NA	S
			1			DC-V115	GB	Inside		Yes	-	Intr. Gas	Manual	C	C	C	C	None	10	D	t
			12			DC-V104	GT	Outside		Yes	0.0	AC Motor	Manual	C	C	O	As Is	None	24	D	S,X
P-6B	LPI	Water	12	55	Yes	DC-V017	CK	Inside	S/D	Yes	-	Flow	None (k)	C	C	O	NA	-	NA	NA	S
			1			DC-V120	GB	Inside		Yes	-	Intr. gas	Manual	C	C	C	C	None	10	B	t
			12			DC-V116	GT	Outside		Yes	0.0	AC Motor	Manual	C	C	O	As Is	None	24	B	S,X
P-6C	LPI	Water	12	55	Yes	DC-V114	CK	Inside	S/D	Yes	-	Flow	None (k)	C	C	O	NA	-	NA	NA	S
			1			DC-V121	GB	Inside		Yes	-	Intr. gas	Manual	C	C	C	C	None	10	A	t
			12			DC-V113	GT	Outside		Yes	0.0	AC Motor	Manual	C	C	O	As Is	None	24	A	S,X
P-6D	LPI	Water	12	55	Yes	DC-V102	CK	Inside	S/D	Yes	-	Flow	None (k)	C	C	O	NA	-	NA	NA	S
			1			DC-V122	GB	Inside		Yes	-	Intr. gas	Manual	C	C	C	C	None	10	C	t
			12			DC-V101	GT	Outside		Yes	0.0	AC Motor	Manual	C	C	O	As Is	None	24	C	S,X

Insert C

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line [illegible]	Fluid	Line Size, in.	GDC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) Fig.[illegible]	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(4)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
P-8A	Chilled Water from Drywell Coolers	Water	8	56	No	GB-V082	GT	Inside	34/6	Yes	–	AC Motor	Manual	O	C	C	AS IS	H,K	51	C	t, x
			1			GB-PSV-9523A	RV	Inside		Yes	–	Pressure	None	C	C	C	NA	–	NA	NA	t, AA
			8			GB-V044	GT	Outside		Yes	0.8	AC Motor	Manual	O	C	C	AS IS	H,K	51	D	t, x
P-8B	Chilled Water from Drywell Coolers	Water	8	56	NO	GB-V084	GT	Inside	3/6	Yes	–	AC Motor	Manual	O	C	C	AS IS	H,K	51	C	t, x
			1			GB-PSV-5522A	RV	Inside		Yes	–	Pressure	None	C	C	C	NA	–	NA	NA	t, AA
			8			GB-V049	GT	Outside		Yes	0.8	AC Motor	Manual	O	C	C	AS IS	H,K	51	D	t, x

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolation	Fluid	Line Size, In.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) [illegible]	Type C Test	Length of Pipe From Cont. to Outside Valves, Ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
P-[illegible]	Recirc Pump Seal Water	Water	3/4	[illegible]	No	[illegible]	[illegible]	Inside	[illegible]	Yes	-	Flow	None	O	C	C	NA	-	NA	NA	[illegible]
			3/4			[illegible]	[illegible]	Outside			15.8	AC motor	Manual	O	C	C	AS IS	[illegible]	[illegible]	[illegible]	[illegible]
P-[illegible]	Recirc Pump Seal Water	Water	3/4	[illegible]	No	[illegible]	[illegible]	Inside	[illegible]	Yes	-	Flow	None	O	C	C	NA	-	NA	NA	[illegible]
			3/4			[illegible]	[illegible]	Outside			23.7	AC motor	Manual	O	C	C	AS IS	[illegible]	[illegible]	[illegible]	[illegible]
P-[illegible]	[illegible]																				[illegible]
P-[illegible]	Drywell Purge Inlet Vent	Gas	[illegible]	[illegible]	Yes	[illegible]	[illegible]	Outside	[illegible]	Yes	-	Compr air	Manual	C	C	C	C	A,H,I	[illegible]	A	[illegible]
			[illegible]			[illegible]	[illegible]	Outside		Yes	43.6	Compr air	Manual	C	C	C	C	A,H,I	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]	[illegible]	Outside		Yes	43.6	Compr air	Manual	C	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]	[illegible]	Outside		Yes	[illegible]	Compr air	Manual	C	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]
			4			[illegible]	GT	Outside		Yes	-	AC motor	Manual	C	O	C	AS IS	A,H,I	[illegible]	[illegible]	[illegible]
			4			[illegible]	GT	Outside		Yes	38.7	AC motor	Manual	C	O	C	AS IS	A,H,I	[illegible]	[illegible]	[illegible]
P-[illegible]	Drywell Purge Outlet Vent	Gas	[illegible]	[illegible]	Yes	[illegible]	[illegible]	Outside	[illegible]	Yes	-	Compr air	Manual	C	C	C	C	A,H,I	[illegible]	A	[illegible]
			[illegible]			[illegible]	[illegible]	Outside		Yes	5.3	Compr air	Manual	C	C	C	C	A,H,I	[illegible]	[illegible]	[illegible]
			2			[illegible]	[illegible]	Outside		Yes	25.7	AC motor	Manual	C	C	C	AS IS	A,H,I	[illegible]	[illegible]	[illegible]
			4			[illegible]	GT	Outside		Yes	-	AC motor	Manual	C	O	C	AS IS	[illegible]	[illegible]	[illegible]	[illegible]
			4			[illegible]	GT	Outside		Yes	7.4	AC motor	Manual	C	O	C	AS IS	A,H,I	[illegible]	[illegible]	[illegible]
P-[illegible]A	RHR Containment Spray	Water	16	[illegible]	Yes	[illegible]	GT	Outside	[illegible]	Yes	-	AC motor	Manual	C	O	C	AS IS	None	[illegible]	[illegible]	[illegible]
			16			[illegible]	GT	Outside		Yes	6.8	AC motor	Manual	C	O	C	AS IS	None	[illegible]	[illegible]	
P-[illegible]B	RHR Containment Spray	Water	16	[illegible]	Yes	[illegible]	GT	Outside	[illegible]	Yes	-	AC motor	Manual	C	O	C	AS IS	None	[illegible]	A	[illegible]
			16			[illegible]	GT	Outside		Yes	7.8	AC motor	Manual	C	O	C	AS IS	None	[illegible]	A	[illegible]
P-[illegible]	Drywell Floor Drain Sump Discharge	Water	3	[illegible]	No	[illegible]	GT	Inside	[illegible]	Yes	-	AC motor	[illegible]	[illegible]	C	C	AS IS	A,H,I	[illegible]	[illegible]	[illegible]
			3			[illegible]	[illegible]	Outside		Yes	[illegible] 44	AC motor	Manual	[illegible]	C	C	AS IS	A,H,I	[illegible]	[illegible]	[illegible]
P-[illegible]	Drywell Equip. Drain Sump Discharge	Water	3	[illegible]	No	[illegible]	GT	Inside	[illegible]	Yes	-	AC motor	[illegible]	O	C	C	AS IS	A,H,I	[illegible]	C	[illegible]
			3			[illegible]	[illegible]	Outside		Yes	[illegible] 45	AC motor	Manual	O	C	C	AS IS	A,H,I	[illegible]	[illegible]	[illegible]
P-[illegible]	Service Air to Drywell	Air	3	[illegible]	No	[illegible]	GT	Inside	[illegible]	Yes	-	[illegible]	[illegible]	C	C	C	NA		NA	NA	[illegible]
			3			[illegible]	GT	Outside		Yes	6.2	[illegible]	[illegible]	C	C	C	NA		NA	NA	[illegible]
P-[illegible]A	Instrument Gas to Drywell	Gas	2	[illegible]	Yes	[illegible]	[illegible]	Inside	[illegible]	Yes	-	AC motor	[illegible]	O	O	C	AS IS	[illegible]	[illegible]	[illegible]	[illegible]
			2			[illegible]	[illegible]	Outside		Yes	20.8	AC motor	Manual	O	O	C	AS IS	[illegible]	[illegible]	[illegible]	[illegible]
P-[illegible]B	Instrument Gas to Drywell	Gas	2	[illegible]	Yes	[illegible]	[illegible]	Inside	[illegible]	Yes	-	AC motor	[illegible]	O	O	C	AS IS	[illegible]	[illegible]	A	[illegible]
			2			[illegible]	[illegible]	Outside		Yes	17.5	AC motor	Manual	O	O	C	AS IS	[illegible]	[illegible]	C	[illegible]

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) Fig(s)	Type C Test	Length of Pipe from Cont. to Outside Valve, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position	(5)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
P-20	[illegible] Supply	Water	4 4	[illegible]	No	[illegible] [illegible]	GT GT	Inside Outside	[illegible]	Yes Yes	1.0'	AC motor AC motor	[illegible] Manual	[illegible] [illegible]	C C		C C	AS IS AS IS	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
P-2[illegible]	[illegible] Return	Water	4 4	[illegible]	No	[illegible] [illegible]	GT GT	Inside Outside	[illegible]	Yes Yes	1.0'	AC motor AC motor	[illegible] Manual	[illegible] [illegible]	C C		C C	AS IS AS IS	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
P-2[illegible]	Breathing Air	Air	4 4	[illegible]	No	[illegible] [illegible]	[illegible] GT	Inside Outside	17/[illegible]	Yes Yes	2.5	[illegible] [illegible]	[illegible] [illegible]	C C	C C		C C	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	- -	[illegible] [illegible]
P-2[illegible]	Spare																					[illegible]
P-2[illegible]	Spare																					[illegible]
P-2[illegible]A	Probe Guide Tube	Gas	3/8 3/8	[illegible] [illegible]	No	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	18/F	Yes No	Later	AC solenoid Explosive	[illegible] [illegible]	C O	C O		C O	[illegible] AS IS	[illegible]	[illegible]	[illegible] [illegible]	[illegible] [illegible]
P-2[illegible]B	Probe Guide Tube	Gas	3/8 3/8	[illegible] [illegible]	No	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	18/F	Yes No	Later	AC solenoid Explosive	[illegible] [illegible]	C O	C O		C O	[illegible] AS IS	[illegible]	[illegible]	[illegible] [illegible]	[illegible] [illegible]
P-2[illegible]C	Probe Guide Tube	Gas	3/8 3/8	[illegible] [illegible]	No	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	18/F	Yes No	Later	AC solenoid Explosive	[illegible] [illegible]	C O	C O		C O	[illegible] AS IS	[illegible]	[illegible]	[illegible] [illegible]	[illegible] [illegible]
P-2[illegible]D	Probe Guide Tube	Gas	3/8 3/8	[illegible] [illegible]	No	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	18/F	Yes No	Later	AC solenoid Explosive	[illegible] [illegible]	C O	C O		C O	[illegible] AS IS	[illegible]	[illegible]	[illegible] [illegible]	[illegible] [illegible]
P-2[illegible]E	Probe Guide Tube	Gas	3/8 3/8	[illegible]	No	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	18/F	Yes No	Later	AC solenoid Explosive	[illegible] [illegible]	C O	C O		C O	[illegible] AS IS	[illegible]	[illegible]	[illegible] [illegible]	[illegible] [illegible]
P-2[illegible]F	Spare																					[illegible]
P-2[illegible]	[illegible] Purge System	Gas	3/8 3/8	[illegible]	No	[illegible] [illegible]	CK [illegible]	Inside Outside	18/F	Yes	Later	Flow Comp air	None [illegible]	O O	C C		C C	[illegible] C	None [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
P-2[illegible]A	[illegible] Insert	Water	1 1	[illegible]	Yes		[illegible] [illegible]	[illegible] Outside	[illegible]/5	No												[illegible]
P-2[illegible]B	[illegible] Insert	Water	1 1	[illegible]	Yes		[illegible] [illegible]	[illegible] Outside	[illegible]/5	No												[illegible]
P-2[illegible]C	[illegible] Insert	Water	1 1	[illegible]	Yes		[illegible] [illegible]	[illegible] Outside	[illegible]/5	No												[illegible]

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, In.	GDC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) Fig(8)	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(3)	Power Failure Valve Position	Containment Isolation Signal(6)	Valve Closure Time, s	Power Source(4)	Remarks(11)
P-[illegible]	CRD Insert	Water	[illegible]	55	Yes		Check / HCU	Inside / Outside	26/5	No / No											8
P-[illegible]A	CRD Withdraw	Water	3/4	55	Yes		HCU	Outside	26/5	No											8
P-[illegible]B	CRD Withdraw	Water	3/4	55	Yes		HCU	Outside	26/5	No											8
P-[illegible]C	CRD Withdraw	Water	3/4	55	Yes		HCU	Outside	26/5	No											8
P-[illegible]D	CRD Withdraw	Water	3/4	55	Yes		HCU	Outside	26/5	No											8
P-37 (A-H)	Vent Pipe																				
P-[illegible]	Chilled Water to Drywell Coolers	Water	6 / 6	56	No	[illegible] / [illegible]	GT / GT	Inside / Outside	24/6	Yes / Yes	- / 0.0	AC motor / AC motor	[illegible] / Manual	O / O	C / C	C / C	AS IS / AS IS	[illegible] / [illegible]	[illegible] / [illegible]	[illegible] / [illegible]	[illegible] / [illegible]
P-[illegible]	Chilled Water from Drywell Coolers	Water	6 / 6	56	No	[illegible] / [illegible]	GT / GT	Inside / Outside	24/6	Yes / Yes	- / 0.0	AC motor / AC motor	[illegible] / Manual	O / O	C / C	C / C	AS IS / AS IS	[illegible] / [illegible]	[illegible] / [illegible]	[illegible] / [illegible]	[illegible] / [illegible]
P-[illegible]	Instrument Gas Suction	Gas	[illegible]	56	No	GL-V001 / GL-V040 / GL-V002	GB / GB / GB	Inside / Outside / Outside	16/F	Yes / Yes / Yes	- / [illegible] / [illegible]	AC motor / AC motor / AC motor	[illegible] / Manual / Manual	O / O / O	C / C / C	C / C / C	AS IS / AS IS / AS IS	[illegible] / [illegible] / [illegible]	[illegible]	[illegible]	[illegible]
[illegible]	HPCI Turbine Exhaust	Water/ Steam	20 / 3 / 20	56	Yes	FD-V[illegible] / FD-V[illegible] / FD-V[illegible]	GT / GT / CK	Outside / Outside / Outside	20/F	Yes / Yes / Yes	17.0 / 31.0 / 34.0	AC motor / DC motor / Flow	Manual / Manual / Manual	O / O / [illegible]	C / C / C	O / O / O	AS IS / AS IS / [illegible]	None / None / -	[illegible]	[illegible]	[illegible]
P-[illegible]	HPCI Pump Suction	Water	16	56	Yes	FJ-V[illegible]	GT	Outside	21/F	Yes	40.5	DC motor	Manual	C	C	O	AS IS	None	[illegible]	[illegible]	[illegible]
P-213	HPCI Minimum Flow Return	Water	4	55	Yes	FJ-V016	GB	Outside	22/F	Yes	27.0	DC motor	Manual	C	C	O	AS IS	None	[illegible]	[illegible]	[illegible]
P-214	HPCI & RCIC Vacuum Relief	Air/ Water	3 / 3 / 6	56	Yes	FC-V[illegible] / FD-V[illegible] / [illegible]	GT / GT / GB	Outside / Outside / Outside	23/T	Yes / Yes / Yes	[illegible] / [illegible] / [illegible]	AC motor / AC motor / AC motor	Manual / Manual / Manual	O / O / O	C / C / C	O / O / O	AS IS / AS IS / AS IS	None / None / None	[illegible]	[illegible]	[illegible]

Insert D

DC. AC.

TS[illegible]

Insert D

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Name	Fluid	Line Size, In.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Piece	Valve Type(1)	Valve Location	Valve Arrangement(2) Fig(3)	Type C Test	Length of Pipe from Cont. to Outside Valves, Ft.	Primary Method of Actuation(1)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(4)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
P-28A	Chilled Water to Drywell Coolers	Water	8	56	NO	GB-V003	GT	Inside	3A/6	Yes	-	AC Motor	Manual	O	C	C	AS IS	H,K	SI	C	E, X
			1			GB-PSV-9582B	PSV	Inside		Yes	-	Pressure	None	C	C	C	NA	—	NA	NA	E, AA
			8			GB-V070	GT	Outside		Yes	0.8	AC Motor	Manual	O	C	C	AS IS	H,K	SI	D	E, X
P-28B	Chilled Water to Drywell Coolers	Water	8	56	NO	GB-V004	GT	Inside	3A/6	Yes	-	AC Motor	Manual	O	C	C	AS IS	H,K	SI	C	E, X
			1			GB-PSV-9583B	PSV	Inside		Yes	-	Pressure	None	C	C	C	NA	—	NA	NA	E, AA
			8			GB-V071	GT	Outside		Yes	0.8	AC Motor	Manual	O	C	C	AS IS	H,K	SI	D	E, X

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	GDC General Design Criterion	ESF System(11)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) Fig 6.2	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
P-005	Spare																				a
P-006	Spare																				a
P-007	RCIC Turbine Exhaust	Steam/Water	3 16 20	56	No	FC-V006 FC-V005 FC-V063	GT GT CK	Outside Outside Outside	20/1	Yes Yes Yes	2.0 24.5 27.0	AC motor DC motor Flow	Manual Manual [illegible]	O O C	C C C	O O O	AS IS AS IS AS IS	None None -	15 45 -	B D	[illegible]
P-008	RCIC Pump Suction	Water	6	56	No	[illegible]-V053	GT	Outside	21/1	Yes	30.6	DC motor	Manual	C	C	O	AS IS	None	20	D	a
P-009	RCIC Minimum Return	Water	2	56	No	[illegible]-V067	GB	Outside	22/1	Yes	23.4	DC motor	Manual	C	C	O	[illegible]	None	[illegible]	D	[illegible]
P-010	RCIC Vacuum Pump Discharge	Water	2	56	No	FC-V011 FC-V040	GB CK	Outside Outside	24/1	Yes Yes	- 16.4	AC motor Flow	Manual Manual	O C	C C	O O	AS IS NA	None -	45 -	B NA	a
P-011A	RHR Pump Suction	Water	24	56	Yes	EC-V034	GT	Outside	75/0	Yes	20.4	AC motor	Manual	O	O	O	AS IS	None	120	A	a
P-011B	RHR Pump Suction	Water	24	56	Yes	EC-V005	GT	Outside	23/0	Yes	32.0	AC motor	Manual	O	O	O	AS IS	None	120	B	a
P-011C	RHR Pump Suction	Water	24	56	Yes	EC-V362	GT	Outside	25/0	Yes	41.0	AC motor	Manual	O	O	O	AS IS	None	120	A	a
P-011D	RHR Pump Suction	Water	24	56	Yes	EC-V050	GT	Outside	75/0	Yes	20.4	AC motor	Manual	O	O	O	AS IS	None	120	C	a
P-012A	RHR Suppression Pool Cooling & Spray Test	Water	1 1 20 18 6 6 6 3	56	Yes	EC-PSV-F025A EC-PSV-F025B EC-V028 EC-V027 EC-V025 EC-V034 EC-V031 EC-V202	SRV SRV GB GB GT GT GT CK	Outside Outside Outside Outside Outside Outside Outside Outside	26/0	No No Yes Yes Yes Yes Yes Yes	214.0 203.3 51.0 63.1 90.3 66.5 70.4 60.2	Pressure Pressure AC motor AC motor AC motor AC motor AC motor Flow	None None Manual Manual Manual Manual Manual None	C C C C C O O O	C C O C C C C C	C C C C C C C C	NA NA AS IS AS IS AS IS AS IS AS IS NA	- - [illegible] [illegible] [illegible] None None -	- - 100 100 27 27 27 -	NA NA B B B B B NA	[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	GDC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) FSIG(3)	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Method of Actuation(2)	Secondary Method of Actuation	Normal Valve Position(5)	Shutdown Valve Position(10)	Post-Accident Position(5)	Power Failure Valve Position	Containment Isolation Signal(6)	Valve Closure Time, s	Power Source(8)	Remarks(7)
P-[illegible]	[illegible] Suppression Pool Cooling & System Test	Water	[illegible]	56	Yes	[illegible]-PSV-F025C	[illegible]	Outside	[illegible]	No	210.5	Pressure	None	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-PSV-F025A	[illegible]	Outside		No	170.4	Pressure	None	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-0124	[illegible]	Outside		Yes	40.8	AC motor	Manual	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-0125	[illegible]	Outside		Yes	63.5	AC motor	Manual	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-0126	[illegible]	Outside		Yes	100.1	AC motor	Manual	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-0128	[illegible]	Outside		Yes	52.4	AC motor	Manual	[illegible]	C	C	[illegible]	None	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-0131	[illegible]	Outside		Yes	40.0	AC motor	Manual	[illegible]	C	C	[illegible]	None	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-0200	[illegible]	Outside		Yes	00.7	Flow	None	[illegible]	C	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P-[illegible]	[illegible] Relief to Suppression Pool	Steam/ Water	[illegible]	56	Yes	[illegible]-PSV-F007	[illegible]	Outside	27/0	No	40.0	Pressure	None	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-PSV-F065A	[illegible]	Outside		No	50.4	Pressure	None	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-PSV-0431B	[illegible]	Outside		No	05.5	Pressure	None	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-0037	[illegible]	Outside		[illegible]	71.3	AC motor	Manual	[illegible]	C	C	[illegible]	None	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-0254	[illegible]	Outside		[illegible]	46.4	AC motor	Manual	[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	C	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P-[illegible]	[illegible] Relief to Suppression Pool	Steam/ Water	[illegible]	56	Yes	[illegible]-PSV-F065A	[illegible]	Outside	27/0	No	[illegible]	Pressure	None	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-PSV-0431A	[illegible]	Outside		No	71.3	Pressure	None	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-0155	[illegible]	Outside		[illegible]	66.8	AC motor	Manual	C	C	C	[illegible]	None	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]-0253	[illegible]	Outside		[illegible]	56.2	AC motor	Manual	[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P-[illegible]A	[illegible] to Suppression Chamber Spray Header	Water	6	56	Yes	[illegible]-0016	[illegible]	Outside	20/0	Yes	[illegible]	AC motor	Manual	C	[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P-[illegible]B	[illegible] to Suppression Chamber Spray Header	Water	6	56	Yes	[illegible]-0112	[illegible]	Outside	20/0	Yes	10.0	AC motor	Manual	C	[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P-[illegible]A	Spare																				[illegible]
P-[illegible]B	Spare																				[illegible]
P-[illegible]A	Core Spray Pump Suction	Water	16	56	Yes	[illegible]-0010	[illegible]	Outside	20/0	Yes	31.0	AC motor	Manual	[illegible]	[illegible]	[illegible]	[illegible]	None	[illegible]	[illegible]	[illegible]
P-[illegible]B	Core Spray Pump Suction	Water	16	56	Yes	[illegible]	[illegible]	Outside	20/0	Yes	32.3	AC motor	Manual	[illegible]	[illegible]	[illegible]	[illegible]	None	[illegible]	[illegible]	[illegible]
P-[illegible]C	Core Spray Pump Suction	Water	16	56	Yes	[illegible]	[illegible]	Outside	20/0	Yes	32.3	AC motor	Manual	[illegible]	[illegible]	[illegible]	[illegible]	None	[illegible]	C	[illegible]
P-[illegible]D	Core Spray Pump Suction	Water	16	56	Yes	[illegible]-0047	[illegible]	Outside	20/0	Yes	32.3	AC motor	Manual	[illegible]	[illegible]	[illegible]	[illegible]	None	[illegible]	[illegible]	[illegible]

[illegible]

Amendment [illegible]

TABLE 5.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) PSID(8)	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Method of Actuation(2)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(5)	Power Failure Valve Position	Containment Isolation Signal(3)	Valve Closure Time, s	Power Source(6)	Remarks(7)
P-[illegible]	Core Spray Test to Suppression Pool	Water	2	56	Yes	[illegible]-PSV-F012B	SRV	Outside	[illegible]	No	56.4	Pressure	None	C	C	C	N/A	-	-	-	[illegible]
			10			[illegible]-V025	GB	Outside		Yes	22.0	AC motor	Manual	C	C	C	AS IS	[illegible]	[illegible]	B	[illegible]
			4			[illegible]-V026	GB	Outside		Yes	54.2	AC motor	Manual	O	C	C	AS IS	None	[illegible]	B	[illegible]
P-[illegible]	Core Spray Test to Suppression Pool	Water	2	56	Yes	[illegible]-PSV-F012A	SRV	Outside	[illegible]	No	100.3	Pressure	None	C	C	C	N/A	-	-	-	[illegible]
			10			[illegible]-V025	GB	Outside		Yes	21.8	AC motor	Manual	C	C	C	AS IS	[illegible]	[illegible]	A	[illegible]
			4			[illegible]-V025	GB	Outside		Yes	32.5	AC motor	Manual	O	C	C	AS IS	None	[illegible]	A	[illegible]
P-[illegible]	Spare																				[illegible]
P-[illegible]	Spare																				[illegible]
P-[illegible]	Spare																				[illegible]
P-[illegible]	Spare																				[illegible]
P-[illegible]	Suppression Chamber Purge Vent & Vacuum Relief	Gas	[illegible]	56	Yes	GS-V[illegible]	BF	Outside	[illegible]	Yes	27.0	Instr air	Spring	C	C	O	C	None	[illegible]	A	[illegible]
			[illegible]			GS-PSV-5020	PSV	Outside		Yes	27.0	Comp air	Spring	C	C	C	C	-	[illegible]	[illegible]	[illegible]
			[illegible]			GS-V007	GT	Outside		Yes	-	AC motor	Manual	C	O	C	AS IS	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			GS-V006	GT	Outside		Yes	30.0	AC motor	Manual	C	O	C	AS IS	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			GS-V020	BF	Outside		Yes	-	Comp air	Spring	C	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			GS-V076	GB	Outside		Yes	31.0	AC motor	Manual	C	C	C	AS IS	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			GS-V027	BF	Outside		Yes	37.7	Comp air	Spring	C	C	C	C	[illegible]	[illegible]	[illegible]	[illegible]
P-[illegible]	Suppression Chamber Purge Inlet & Vacuum Relief	Gas	[illegible]	56	Yes	GS-V027	BF	Outside	[illegible]	Yes	33.3	Comp air	Spring	C	C	C	C	[illegible]	[illegible]	A	[illegible]
			[illegible]			GS-V010	GT	Outside		Yes	33.3	AC motor	Manual	C	O	C	AS IS	[illegible]	[illegible]	A	[illegible]
			[illegible]			GS-V008	GT	Outside		Yes	41.8	AC motor	Manual	C	O	C	AS IS	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			GS-V038	BF	Outside		Yes	-	Instr air	Spring	C	C	O	C	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]			GS-PSV-5032	PSV	Outside	[illegible]	Yes	25.6	Comp air	Spring	C	C	C	C	-	[illegible]	[illegible]	[illegible]
P-[illegible] (A-[illegible])	Construction Drains																				[illegible]
P-[illegible]	Suppression Pool Cleanup Return	Water	6	56	No	EE-V002	GT	Outside	[illegible]	Yes	16.0	AC motor	Manual	C	C	C	AS IS	[illegible]	[illegible]	A	[illegible]
			6			EE-V001	GT	Outside		Yes	10.3	AC motor	Manual	C	C	C	AS IS	[illegible]	[illegible]	B	[illegible]
P-203	Suppression Pool Cleanup Supply	Water	6	56	No	EE-V003	GT	Outside	[illegible]	Yes	20.4	AC motor	Manual	C	C	C	AS IS	[illegible]	[illegible]	A	[illegible]
			6			EE-V004	GT	Outside		Yes	22.0	AC motor	Manual	C	C	C	AS IS	[illegible]	[illegible]	B	[illegible]
P-226	Spare																				[illegible]
P-[illegible]	Hrs Used																				

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, In.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) Fig(4)	Type C Test	Length of Pipe from Cont. to Outside Valves, Ft.	Primary Method of Actuation(3)	Secondary Method of Actuation(3)	Normal Valve Position(4)	Shutdown Valve Position(4)	Post-Accident Position(5)	Power Failure Valve Position	Containment Isolation Signal(6)	Valve Closure Time, s	Power Source(6)	Remarks(7)
P-[illegible]	Spare																				[illegible]
P-[illegible]	Post Accident Liquid Sampling System Return	Water	1	[illegible]	No	[illegible]-SV-[illegible]A [illegible]-SV-[illegible]B	[illegible] [illegible]	Outside Outside	[illegible]	Yes Yes	- 10.5	DC solenoid DC solenoid	None [illegible] None [illegible]	C C	[illegible] [illegible]	C C	C C	None None	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
P-[illegible]	Suppression Pool Water Level	Water	[illegible]	[illegible]	Yes	[illegible]	[illegible]	Outside	[illegible]	No	23.0	AC motor	Manual	O	O	O	AS IS	None	[illegible]	A	[illegible]
P-[illegible] (A-H)	Vent Pipe																				[illegible]
P-[illegible] (A-H)	Vacuum Break Connection																				[illegible]
P-[illegible] (A-H)	Vent Pipe Drain																				[illegible]
P-[illegible] (A-H)	SRV Discharge																				[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, In.	GDC General Design Criterion	ESF System(11)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) P&ID(8)	Type C Test	Length of Pipe from Cont. to Outside Valves, Ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
INSTRUMENTATION LINE PENETRATIONS																					
J-1 (A-F)	Spare																				[illegible]
J-2A	Spare																				[illegible]
J-2[illegible]	Spare																				[illegible]
J-2[illegible]	RPV Level & Pressure Switch	Water/Steam	1	[illegible]	-	[illegible]	[illegible] [illegible]	Inside Outside	37/[illegible]	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-2D	Spare																				[illegible]
J-2E	Spare																				[illegible]
J-2[illegible]	Spare																				[illegible]
J-3A	RPV Level	Water/Steam	1	[illegible]	-	[illegible]	[illegible] [illegible]	Inside Outside	37/[illegible]	No	0.0	Flow	None	O	O	O	[illegible]	NA	NA	NA	[illegible]
J-3B	"[illegible]" Hydrogen/Oxygen Analyzer Gas Inlet	Gas	1	[illegible]	Yes	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	[illegible]/AA	Yes Yes	[illegible]	AC Motor AC Motor	Manual Manual	C C	O O	C C	AS IS AS IS	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible]
J-3C	Spare																				[illegible]
J-3[illegible]	Spare																				[illegible]
J-3[illegible]	Spare																				[illegible]
J-3[illegible]	Spare																				[illegible]
J-4A	Spare																				[illegible]
J-4B	Spare																				[illegible]
J-4C	Spare																				[illegible]
J-4D	Spare																				[illegible]
J-4E	Spare																				
J-4F	Spare																				

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	SRC General Design Criterion	ESF System(11)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) Fig(8)	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
[illegible]	RCPB Leakage [illegible] Sampler	Gas	[illegible]	[illegible]	No	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	[illegible]	Yes	24.0	AC motor AC motor	Manual Manual	O O	C C	C C	AS IS AS IS	A,B,I A,B,I	[illegible] [illegible]	A B	[illegible] [illegible]
[illegible]	Spare																				[illegible]
[illegible]	RPV Pressure & [illegible] Drain	Water/Steam	[illegible]	[illegible]	-	[illegible]	[illegible] [illegible]	Inside Outside	[illegible]	No	- [illegible]	Flow	None	[illegible]	[illegible]	[illegible]	NA	NA	NA	NA	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Drywell Pressure Gas	Gas	[illegible]	[illegible]	Yes	[illegible]	[illegible]	Outside	[illegible]	No	21.1	[illegible]	None [illegible]	[illegible]	[illegible]	[illegible]	NA	NA	NA	NA	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Drywell Pressure Gas	Gas	[illegible]	[illegible]	Yes	[illegible]	[illegible]	Outside	[illegible]	No	22.5	[illegible]	None [illegible]	[illegible]	[illegible]	[illegible]	NA	NA	NA	NA	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	"[illegible]" Hydrogen/Oxygen Analyzer Inlet	Gas	[illegible]	[illegible]	Yes	[illegible] [illegible] [illegible]	[illegible] [illegible] [illegible]	Outside Outside Outside	[illegible]	Yes Yes Yes	- [illegible] [illegible]	AC motor AC motor AC motor	Manual Manual Manual	C C C	[illegible] [illegible] C	C C C	AS IS AS IS AS IS	A,B,I A,B,I A,B,I	[illegible] [illegible] [illegible]	[illegible] [illegible] [illegible]	[illegible] [illegible] [illegible]
[illegible]	Post Accident Gas Sampling System	Gas	[illegible]	[illegible]	No	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	[illegible]	Yes Yes	- [illegible]	DC solenoid DC solenoid	None [illegible] [illegible]	C C	[illegible] [illegible]	C C	C C	None [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
[illegible]	Spare																				[illegible]

Amendment [illegible], [illegible]

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, In.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) FSIG(8)	Type C Test	Length of Pipe from Cont. to Outside Valves, Ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(4)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s.	Power Source(6)	Remarks(7)
J-8A	Spare																				[illegible]
J-8B	Spare																				[illegible]
J-8C	RCPB Leak Detection	Gas	1	56	No	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	[illegible]	Yes Yes	- 27.7	AC motor AC motor	Manual Manual	[illegible] [illegible]	C C	C C	AS IS AS IS	A,H,[illegible] A,H,[illegible]	[illegible] [illegible]	A B	[illegible]
J-8D	Drywell pressure	Gas	1	56	Yes	[illegible]	[illegible]	Outside	[illegible]	No	10.5	[illegible]	[illegible] (LM)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J-8E	Spare																				[illegible]
J-8F	Spare																				[illegible]
J-8G	Spare																				[illegible]
J-8H	Spare																				[illegible]
J-8K	Spare																				[illegible]
J-8M	Spare																				[illegible]
J-9E	"A" Hydrogen/Oxygen Analyzer Inlet	Gas	1	56	Yes	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	[illegible]	Yes Yes	- [illegible]	AC motor AC motor	Manual Manual	C C	[illegible] [illegible]	C C	AS IS AS IS	A,H,[illegible] A,H,[illegible]	[illegible] [illegible]	A C	[illegible]
J-9F	Spare																				[illegible]
J-10A	Spare																				[illegible]
J-10B	Spare																				[illegible]
J-10C	"B" Hydrogen/Oxygen Analyzer Inlet	Gas	1	56	Yes	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	[illegible]	Yes Yes	- [illegible]	AC motor AC motor	Manual Manual	C C	[illegible] [illegible]	C C	AS IS AS IS	A,H,[illegible] A,H,[illegible]	[illegible] [illegible]	A C	[illegible]
J-10D	Drywell Pressure	Gas	1	56	Yes	[illegible]	[illegible]	Outside	[illegible]	No	10.1	[illegible]	[illegible] (LM)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J-10E	Post-Accident Gas Sampling System	Gas	1	56	No	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	[illegible]	Yes Yes	- 31.3	DC solenoid DC solenoid	[illegible] [illegible]	C C	[illegible] [illegible]	C C	C C	None None	[illegible] [illegible]	[illegible] [illegible]	[illegible]
J-10F	Spare																				[illegible]

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	NRC General Design Criterion	ESF System	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2)	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(4)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s.	Power Source(6)	Remarks(7)
J-[illegible]A	Reactor Recir Flow-Loop [illegible]	Water/Steam	1	55	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J-[illegible]B	Reactor Recir Flow-Loop [illegible]	Water/Steam	1	55	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J-[illegible]C	Spare																				
J-[illegible]D	Spare																				
J-[illegible]E	Reactor Recir Flow-Loop [illegible]	Water/Steam	1	55	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J-[illegible]F	Jet pump flow	Water/Steam	1	55	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J-[illegible]A	Spare																				
J-[illegible]B	Reactor Recir Flow-Loop [illegible]	Water/Steam	1	55	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J-[illegible]C	Reactor Recir Flow-Loop [illegible]	Water/Steam	1	55	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J-[illegible]D	Spare																				
J-[illegible]E	Reactor Recir Flow-Loop [illegible]	Water/Steam	1	55	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J-[illegible]F	Reactor Recir Flow-Loop [illegible]	Water/Steam	1	55	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J-[illegible]A	Spare																				
J-[illegible]B	Spare																				
J-[illegible]C	Spare																				
J-[illegible]D	Reactor Flow	Water/Steam	1	55	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J-[illegible]E	Spare																				
J-[illegible]F	Spare																				

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) Fig(6.2)	Type C Test	Length of Pipe from Cont. to Outside Valve, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time(6)	Power Source(6)	Remarks(7)
J-14A	Reactor Recir Flow-Loop A	Water/ Steam	1	55	-	[illegible]	FO XX	Inside Outside	37/Y	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-14B	Reactor Recir Flow-Loop A	Water/ Steam	1	55	-	[illegible]	FO XX	Inside Outside	37/Y	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-14C	Reactor Recir Flow-Loop A	Water/ Steam	1	55	-	[illegible]	FO XX	Inside Outside	37/Y	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-14D	Reactor Recir Flow-Loop A	Water/ Steam	1	55	-	[illegible]	FO XX	Inside Outside	37/Y	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-14E	Reactor Recir Flow-Loop A	Water/ Steam	1	55	-	[illegible]	FO XX	Inside Outside	37/Y	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-14F	Reactor Recir Flow-Loop B	Water/ Steam	1	55	-	[illegible]	FO XX	Inside Outside	37/Y	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-15A	Spare																				[illegible]
J-15B	Spare																				[illegible]
J-15C	Spare																				[illegible]
J-15D	Spare																				[illegible]
J-15E	Spare																				[illegible]
J-15F	Spare																				[illegible]
J-16A	Spare																				[illegible]
J-16B	Spare																				[illegible]
J-16C	Reactor Flow	Water/ Steam	1	55	-	[illegible]	FO XX	Inside Outside	37/Y	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-16D	Spare																				

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	GDC General Design Criterion	ESF System(11)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) PS(8)(A)	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(5)	Power Failure Valve Position	Containment Isolation Signal(6)	Valve Closure Time, s	Power Source(A)	Remarks(7)
J-[illegible]	Reactor Flow	Water/Steam	1	55	-	[illegible]	PO EF	Inside Outside	37/A	No	0.0	Flow	None	O	O	O	NA	[illegible]	NA	NA	a
J-[illegible]	Reactor Flow	Water/Steam	1	55	-	[illegible]	PO EF	Inside Outside	37/A	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	b
J-[illegible]	Spare																				*
J-[illegible]	Spare																				*
J-[illegible]	Spare																				*
J-[illegible]	Spare																				*
J-[illegible]	Spare																				*
J-[illegible]	Spare																				*
J-[illegible]	Spare																				*
J-[illegible]	Reactor Flow	Water/Steam	1	55	-	[illegible]	PO EF	Inside Outside	37/A	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	b
J-[illegible]	Spare																				*
J-[illegible]	Spare																				*
J-[illegible]	Spare																				*
J-[illegible]	Reactor Flow	Water/Steam	1	55	-	[illegible]	PO EF	Inside Outside	37/A	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	d
J-[illegible]	HPCI Turbine Steam Supply	Steam/Water	1	55	-	[illegible]	PO EF	Inside Outside	37F	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	b
J-[illegible]	HPCI Turbine Steam Supply	Steam/Water	1	55	-	[illegible]	PO EF	Inside Outside	37F	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	*
J-[illegible]	Core Spray Flow	Water	1	55	-	[illegible]	PO EF	Inside Outside	37A	No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	b
J-[illegible]	[illegible] Flow	Water/Steam	1	55	-	[illegible]	PO EF	Inside Outside	37A	No	0.1	Flow	None	O	O	O	NA	NA	NA	NA	b
J-[illegible]	[illegible] Flow	Water/Steam	1	55	-	[illegible]	PO EF	Inside Outside	37A	No	0.1	Flow	None	O	O	O	NA	NA	NA	NA	d

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Includes	Fluid	Line Size, in.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) PS(R)(3)	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(4)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
[illegible]	Reactor Pressure	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	O	O	O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	RCIC Turbine Steam Supply	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	O	O	O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	RCIC Turbine Steam Supply	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	O	O	O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Main Steam Flow-Line C	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	O	O	O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Main Steam Flow-Line B	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	O	O	O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Main Steam Flow-Line C	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	O	O	O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Main Steam Flow Line D	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	O	O	O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Main Steam Flow-Line A	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	O	O	O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Main Steam Flow-Line A	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	O	O	O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Main Steam Flow-Line B	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	O	O	O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE [illegible]

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, In.	NRC General Design Criterion	ESF System(11)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) P&ID(8)	Type C Test	Length of Pipe From Cont. to Outside Valves, Ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(3)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
[illegible]	Main Steam Flow-Line B	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	RHR LPCI Check Valve Pressure	Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	RHR LPCI Check Valve Pressure	Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Recirc Pump Differential Pressure	Water/Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Recirc Flow	Water/Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Recirc Flow	Water/Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] Flow	Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Reactor Pressure	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Reactor Recirc Flow Loop B	Water/Steam	1	[illegible]		[illegible]	[illegible]	Inside Outside													[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Main Steam Flow-Line A	Steam/Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				

[illegible]

Amendment [illegible]

TABLE [illegible]

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, In.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2)	Type C Test	Length of Pipe from Cont. to Outside Valves, Ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(4)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
[illegible]	Main Steam Flow-Line A	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Main Steam Flow-Line B	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Main Steam Flow-Line B	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Main Steam Flow-Line C	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Main Steam Flow Line C	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Main Steam Flow-Line D	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] Flow	Water/Steam	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				

Amendment [illegible]

[illegible]

TABLE 6.2-[illegible]

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	GDC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2)	Type C Test	Length of Pipe From Cont. to Outside Valves, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(4)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
[illegible]	Main Steam Flow-Line B	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	- 0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Recirc Flow	Water	[illegible]	[illegible]	-	[illegible] [illegible]	[illegible]	Inside Outside	[illegible]	No	- 0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	HPCI Turbine Steam Supply	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	- 0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	HPCI Turbine Steam Supply	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	- 0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Recirc Flow	Water/Steam	[illegible]	[illegible]	-	[illegible] [illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	- 0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Recirc Flow	Water/Steam	[illegible]	[illegible]	-	[illegible] [illegible]	[illegible]	Inside Outside	[illegible]	No	- 0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Recirc Pump Cooling - Loop A	Water/Steam	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	- 0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Recirc Pump Cooling - Loop B	Water/Steam	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No	- 0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Core Spray Flow	Water	[illegible]	[illegible]	-	[illegible] [illegible]	[illegible]	Inside Outside	[illegible]	No	- 0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]

[illegible]

TABLE 6.2-[illegible]

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, In.	GDC General Design Criterion	ESF System	Valve Number and/or Orifice Plate	Valve Type	Valve Location	Valve Arrangement	Type C Test	Length of Pipe From Cont. to Outside Valve, ft.	Primary Means of Actuation	Secondary Means of Actuation	Normal Valve Position	Shutdown Valve Position	Post-Accident Position	Power Failure Valve Position	Containment Isolation Signal	Valve Closure Time	Power Source	Remarks
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Recirc Pump Cooler-Loop [illegible]	Water/ Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Recirc Pump Cooler-Loop [illegible]	Water/ Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Recirc Pump Differential Pressure	Water/ Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Recirc Pump Differential Pressure	Water/ Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	RHR LPCI Check Valve Pressure	Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	RHR LPCI Check Valve Pressure	Water	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	[illegible] Flow	Water/ Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Recirc Pump Differential Pressure	Water/ Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	[illegible]	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

TABLE 6.2-[illegible]

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	GDC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(2)	Valve Location	Valve Arrangement(3) Fig(4)	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Method of Actuation(2)	Secondary Method of Actuation	Normal Valve Position(5)	Shutdown Valve Position(6)	Post-Accident Position(6)	Power Failure Valve Position	Containment Isolation Signal(6)	Valve Closure Time, s	Power Source(6)	Remarks(7)
J-30C	[illegible] Flow	Water/Steam	1	[illegible]	-	[illegible]		Inside Outside			0.9	Flow	None								
J-30D	Recirc Flow	Water/Steam	1	[illegible]	-	[illegible]		Inside Outside			0.9	Flow	None								
J-30E	Recirc Flow	Water/Steam	1	[illegible]	-	[illegible]		Inside Outside			0.9	Flow	None								
J-30F	Reactor Pressure	Steam/Water	1	[illegible]	-	[illegible]		Inside Outside			0.9	Flow	None								
J-31A	RHR LPCI Check Valve Pressure	Water	1	[illegible]	-	[illegible]		Inside Outside			0.9	Flow	None								
J-31B	Spare																				
J-31C	RHR LPCI Check Valve Pressure	Water	1	[illegible]	-	[illegible]		Inside Outside			0.9	Flow	None								
J-31D	Spare																				
J-31E	Spare																				
J-31F	Spare																				
J-32A	RHR LPCI Check Valve Pressure	Water	1	[illegible]	-	[illegible]		Inside Outside			0.9	Flow	None								
J-32B	RHR LPCI Check Valve Pressure	Water	1	[illegible]	-	[illegible]		Inside Outside			0.9	Flow	None								
J-32C	[illegible] Line	Gas	1	[illegible]	-	[illegible]		Inside Outside			0.7	Manual [illegible]	None [illegible]								
J-32D	[illegible] Line	Gas	1	[illegible]	-	[illegible]		Inside Outside			0.7	Manual [illegible]	None [illegible]								
J-32E	Recirc Flow	Water/Steam	1	[illegible]	-	[illegible]		Inside Outside			0.7	Flow	None								
J-32F	Recirc Flow	Water/Steam	1	[illegible]	-	[illegible]		Inside Outside			0.7	Flow	None								

T[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	NRC General Design Criterion	ESF System(15)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(8) Fig.	Type C Test	Length of Pipe from Cont. to Outside Valve, Ft.	Primary Method of Actuation	Secondary Method of Actuation	Normal Valve Position	Shutdown Valve Position	Post-Accident Position	Power Failure Valve Position	Containment Isolation Signal	Valve Closure Time, s	Power Source	Remarks(2)
[illegible]	Reactor Recir Flow-Loop A	Water/Steam	1	[illegible]	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Reactor Recir Flow-Loop	Water/Steam	1	[illegible]	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Reactor Recir Flow-Loop	Water/Steam	1	[illegible]	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Jet Pump Flow	Water/Steam	1	[illegible]	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Jet Pump Flow/Post-Accident Liquid Sampling	Water/Steam	1	[illegible]	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
					[illegible]	[illegible]	[illegible]	Outside		Yes	[illegible]	DC Solenoid	None	C	[illegible]	C	C	[illegible]	[illegible]	[illegible]	[illegible]
					[illegible]	[illegible]	[illegible]	Outside		Yes	17.3	DC Solenoid	None	C	[illegible]	C	C	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Reactor Flow	Water/Steam	1	[illegible]	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	C
[illegible]	Reactor Flow	Water/Steam	1	[illegible]	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] Flow	Water/Steam	1	[illegible]	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	[illegible] Flow	Water/Steam	1	[illegible]	-	[illegible]	FO [illegible]	Inside Outside	[illegible]	No	0.0	Flow	None	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]
[illegible]	Spare																				[illegible]

Amendment [illegible]

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	GDC General Design Criterion	ESF System(11)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) P&ID(8)	Type C Test	Length of Pipe from Cont. to Outside Valve, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(5)	Power Failure Valve Position	Containment Isolation Signal(6)	Valve Closure Time, s	Power Source(6)	Remarks(7)
J-22F	Spare																				
J-40A	RCIC Turbine Steam Supply Flow	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/1	No	- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-40B	RCIC Turbine Steam Supply Flow	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/1		- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-40C	Reactor Recirc Flow-Loop B	Water/Steam	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/R	No	- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-40D	Reactor Recirc Flow-Loop B	Water/Steam	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/R	No	- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-40E	Reactor Recirc Flow-Loop B	Water/Steam	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/R	No	- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-40F	Reactor Recirc Flow-Loop B	Water/Steam	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/1	No No	- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-41	Reactor Pressure	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/1	No No	- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-42	Reactor Pressure	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/1	No No	- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-43	Reactor Pressure	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/1	No No	- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-44	Reactor Pressure	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/1	No No	- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-45	Reactor Pressure	Steam/Water	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/1	No No	- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-46	Reactor Pressure	Water/Steam	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/1	No No	- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-47	Reactor Pressure	Water/Steam	[illegible]	[illegible]	-	[illegible]	[illegible]	Inside Outside	37/1	No No	- 0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, In.	GDC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) PS/B(6)	Type C Test	Length of Pipe from Cont. to Outside Valves, Ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time,s	Power Source(8)	Remarks(7)
J-[illegible]	Reactor Pressure	Water/ Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-[illegible]	Reactor Pressure	Water/ Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-[illegible]	Reactor Pressure	Water/ Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-[illegible]	Reactor Pressure	Water/ Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-[illegible]	Reactor Pressure	Water/ Steam	1	[illegible]	-	[illegible]	[illegible]	Inside Outside	[illegible]	No No	0.0	Flow	None	O	O	O	NA	NA	NA	NA	[illegible]
J-[illegible]	Suppression Chamber Outlet to "A" Hydrogen/ Oxygen Analyzer	Gas	1	[illegible]	Yes	[illegible] [illegible]	[illegible]	Outside Outside	[illegible]	Yes Yes	41.4	AC motor AC motor	Manual Manual	C C	O O	C C	AS 15 AS 15	A,R,S A,R,S	[illegible]	[illegible]	[illegible]
J-[illegible]	Suppression Chamber Outlet to "B" Hydrogen/ Oxygen Analyzer	Gas	1	[illegible]	Yes	[illegible] [illegible]	[illegible]	Outside Outside	[illegible]	Yes Yes	24.6	AC motor AC motor	Manual Manual	C C	O O	C C	AS 15 AS 15	A,R,S A,R,S	[illegible]	[illegible]	[illegible]
J-[illegible]	Spare																				[illegible]
J-[illegible]	Spare																				[illegible]
J-[illegible]	Spare																				[illegible]
J-[illegible]	Post-Accident Gas Sampling System	Gas	1	[illegible]	No	[illegible] [illegible]	[illegible]	Outside Outside	43/CC [illegible]	Yes Yes	16.5	DC Solenoid DC Solenoid	None Manual	C C	O O	C C	C C	None None	NA NA	[illegible]	[illegible]
J-[illegible]	Suppression Chamber Pressure	Gas	1	[illegible]	Yes	[illegible]	[illegible]	Outside	[illegible]	No	17.2	[illegible]	[illegible]	O	O	NA	NA	NA	NA	[illegible]	[illegible]
J-[illegible]	Suppression Chamber Pressure	Gas	1	[illegible]	Yes	[illegible]	[illegible]	Outside	[illegible]	No	20.6	[illegible]	[illegible]	O	O	NA	NA	NA	NA	[illegible]	[illegible]

Amendment [illegible]

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, In.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) Fig.[illegible]	Type C Test	Length of Pipe from Cont. to Outside Valves, Ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(4)	Post-Accident Position(4)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
J-[illegible]	Suppression Pool Water Level/[illegible]	Gas	1	[illegible]	Yes	[illegible] [illegible] [illegible]	[illegible] [illegible] [illegible]	Outside Outside Outside	[illegible]	[illegible] Yes [illegible] No [illegible]	10.0 23.3 [illegible]	[illegible] Manual [illegible] AC motor	[illegible] (Manual)(16) [illegible] (Manual)(16) Manual	C C O	C C C	C C O	[illegible] [illegible] AS IS	[illegible] [illegible] [illegible]	[illegible] [illegible] [illegible]	[illegible] [illegible] [illegible]	[illegible] [illegible] [illegible]
J-[illegible]	Suppression Chamber Inlet to "[illegible]" Hydrogen/Oxygen Analyzer	Gas	1	[illegible]	Yes	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	[illegible]	Yes Yes	- 27.6	AC motor AC motor	Manual Manual	C C	O O	C C	AS IS AS IS	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
J-[illegible]	Instrument Air to Torus	Gas	1	[illegible]	[illegible]	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	[illegible]	Yes Yes	- 37.6	Compr. air Compr. air	Spring (Manual) Spring (Manual)	O O	C C	C C	C C	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
J-[illegible]	Suppression Chamber Inlet to "[illegible]" Hydrogen/Oxygen Analyzer	Gas	1	[illegible]	Yes	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	[illegible]	Yes Yes	- [illegible]	AC motor AC motor	Manual Manual	C C	O O	C C	AS IS AS IS	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]
J-[illegible]	Spare																				[illegible]
J-[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
J-[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
J-[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
J-[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
J-[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
J-[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]

Amendment [illegible]

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, In.	NRC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) Fig(8)	Type C Test	Length of Pipe From Cont. to Outside Valves, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(5)	Power Failure Valve Position	Containment Isolation Signal(6)	Valve Closure Time, s	Power Source(7)	Remarks(11)
[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
[illegible]	Spare																				
[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]
[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												[illegible]

[illegible]

TABLE 6.2-16

CONTAINMENT PENETRATIONS

Containment Penetration Number	Line Isolated	Fluid	Line Size, in.	GDC General Design Criterion	ESF System(1)	Valve Number and/or Orifice Plate	Valve Type(1)	Valve Location	Valve Arrangement(2) [illegible]	Type C Test	Length of Pipe from Cont. to Outside Valves, ft.	Primary Method of Actuation(3)	Secondary Method of Actuation	Normal Valve Position(4)	Shutdown Valve Position(10)	Post-Accident Position(8)	Power Failure Valve Position	Containment Isolation Signal(5)	Valve Closure Time, s	Power Source(6)	Remarks(7)
J-[illegible]	Spare																				a
J-[illegible]	Suppression Pool Temperature	Water				Thermowell			[illegible]												a,b
J-[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												a,b
J-[illegible]	Suppression Pool Temperature	Water				Thermowell			-/[illegible]												a,b
J-[illegible]	Spare																				a
J-[illegible]	Suppression Pool Water Level	Water	1	[illegible]	Yes	SJ-V[illegible]	[illegible]	Outside	[illegible]/F	No	[illegible].7	AC motor	Manual	O	O	O	AS IS	None	[illegible]	C	[illegible]
J-[illegible]	Spare																				a
J-[illegible]	Suppression Pool Water Level	Water	1	[illegible]	Yes	SJ-V[illegible]	[illegible]	Outside	[illegible]/F	No	13.5	AC motor	Manual	O	O	O	AS IS	None	[illegible]	C	[illegible]
J-[illegible]	Post Accident Gas Sampling System Return Line	Gas	1	[illegible]	No	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	[illegible]/CC	Yes Yes	[illegible].7	DC solenoid DC solenoid	None [illegible] None [illegible]	C C	O O	C C	C C	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible]
J-[illegible]	Post Accident Gas Sampling	Gas	1	[illegible]	No	[illegible] [illegible]	[illegible] [illegible]	Outside Outside	[illegible]/CC	Yes Yes	[illegible]	DC solenoid DC solenoid	None [illegible] None [illegible]	C C	O O	C C	C C	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible]
J-[illegible]	Spare																				a
J-[illegible]	Spare																				a
J-[illegible]	Spare																				a
J-[illegible]	Spare																				a
J-[illegible]	Spare																				a
J-[illegible]	Spare																				a

T[illegible]

TABLE 6.2-16

(1) Valve type:

Ball	BL
Butterfly	BF
Check valve	CK
Gate valve	GT
Globe	GB
Pressure relief	PSV
Stop check	SCK
Safety relief	SRV
Explosive (shear)	XP
Excess flow check	XV
Ball check	BLCK
Hydralic control unit	HCU
Restriction orifice	FO

(2) See Figure 6.2-28. Numbers in this column refer to details in the figure.

(3) AC-operated valves required for isolation functions are powered from the AC standby power buses. DC-operated isolation valves are powered from the station batteries.

(4) Normal valve position (open or closed) is the position during normal power operation of the reactor.

(5) Table of isolation signal codes:

A - Reactor Vessel Low Water Level - L2
B - Main Steam Line - High Radiation
C- Not used
D - Main Steam Line - High Flow
E - Main Turbine Inlet - Low Steam Pressure (Run Mode)
F - Main Condenser - Low Vacuum (Main Stop Valve Greater than 90% Open)
G - Main Steam Line Tunnel - High Temperature
H - Drywell High Pressure
I - Reactor Building High Radiation
J - Reactor Vessel Low Water Level - L3
K - Reactor Vessel Low Water Level - L1
L - Reactor Water Cleanup System - Area High Temperature in the system's equipment compartment
M - Reactor Water Cleanup System - Area High Differential Temperature across the system's equipment compartment ventilation ducts
N - Reactor Water Cleanup System - High Differential Flow between the system influent and effluent piping outside the drywell
O - Standby Liquid Control System Operating
P - Reactor Water Cleanup - High Temperature at Outlet of Nonregenerative Heat Exchanger

TABLE 6.2-16 (Cont'd)

(6) Power source:

Electrical Separation ~~Source~~ Channels:

A - Class 1E electrical channel
B - Class 1E electrical channel
C - Class 1E electrical channel
D - Class 1E electrical channel
W - Reactor protection system (RPS) electrical separation channel
X - RPS electrical separation channel
Y - RPS electrical separation channel
Z - RPS electrical separation channel
N - Non-Class 1E

For explanation of electrical separation channels, refer to Section 8.1.

(7) Remarks:

a. The main steam isolation valve requires that both solenoid pilots be deenergized to close the valve. Accumulator air pressure plus spring act together to close the valve when both pilots are deenergized. Voltage failure at only one pilot does not cause valve closure. The valve is designed to fully close in less than 10 seconds, but in no less than 3 seconds.

b. A separate pressure interlock closes the valve ~~upon~~ on high reactor pressure.

c. Separate HPCI system isolation provisions ~~isolate these~~ close this valve on exhaust pressure high, area temperature high, steam pressure low, ~~and~~ or steam flow high.

d. Separate RCIC system isolation provisions ~~isolate these~~ close this valve on exhaust pressure high, area temperature high, steam pressure low, ~~and~~ or steam flow high.

e. Valve ~~FD-V007 and FD-V010 isolate~~ closes on HPCI system steam line pressure ~~high, and drywell pressure high.~~ low and drywell pressure high.

f. ~~Valve closes on HPCI system exhaust pressure high, area temperature high, steam pressure low, and steam flow high.~~ Valve closes on RCIC system steam line pressure low and drywell pressure high.

cc. Where no Appendix J, Type C test is indicated, see Table 6.2-24 for further discussion.

TABLE 6.2-16 (Cont'd)

g. Valves close on HPCI system high discharge flow.

h. Valve closes on RCIC system high discharge flow.

i. Valve ~~BC-V031, V034, V128, and V131~~ closes on RHR system high discharge flow.

j. Valve ~~BE-V035, V036 close~~ closes on core spray system high discharge flow.

k. This penetration is a boundary between the drywell and the suppression chamber. It is not a path from the primary containment to the environment.

l. Deleted ~~This penetration is classified as an ESF penetration since it is used by the containment hydrogen recombiner system.~~

m. Sealed penetration

n. Relief valve set pressure - 410 psig

o. Relief valve set pressure - 68 psig

p. Relief valve set pressure - 495 psig

q. Relief valve set pressure - 500 psig

r. Locked closed valve

s. System defined as essential per the definition in HCGS' response to NUREG-0737, Item II.E.4.2

t. System defined as nonessential per the definition in HCGS' response to NUREG-0737, Item II.E.4.2

u. Designed and installed per Regulatory Guide 1.11 as discussed in Section 1.8.1.11. ~~Instrument lines are not classified as either essential or nonessential~~

v. Penetration P-22 and P-220 share primary containment isolation provisions.

w. Penetration P-70 and J-202 share primary containment isolation provisions.

x. Manual override of the isolation signal is provided to enable the operator to change the post-accident position of the valve.

y. This valve will be tested as part of the MSIV sealing system per Chapter 16 requirements.

z. Relief valve set pressure - 1490 psig

aa. Relief valve set pressure - 150 psig

bb. Penetrations P-20, P-206, P-207, P-213A and P-213B share primary containment isolation provisions.

TABLE 6.2-16 (Cont'd)

(8) P&ID(s) published as FSAR figures depicting the penetration configuration.

Note	Figures
A	5.1-3, Sh 1 5.1-3, Sh 2 6.7-1
B	5.1-3, Sh 1 5.4-8 5.4-17 6.3-1
C	5.4-13, Sh 1
D	5.4-13, Sh 1 5.4-13, Sh 2
E	6.3-7 6.3-1
F	6.3-1
G	9.2-14, Sh 2
H	5.4-17
I	5.4-8
J	5.1-3, Sh 1
K	5.4-2, Sh 1
L	9.3-8
M	6.2-29 6.2-30
N	9.3-7, Sh 1 9.3-7, Sh 3
O	9.3-3
P	9.3-11, Sh 1
Q	9.2-17
R	9.5-32
S	4.6-6
T	6.3-1 5.4-13, Sh 1 5.4-8
U	6.3-7
V	6.2-41
W	9.1-5, Sh 2
X	9.3-5, Sh 1
Y	5.1-4, Sh 1
Z	Deleted
AA	6.2-29
BB	11.5-3, Sh 1
CC	9.3-5, Sh 2
DD	5.4-13, Sh 2
EE	5.4-2, Sh 1 9.3-5
FF	6.3-1 6.2-41
GG	5.1-3, Sh 1 5.1-3, Sh 2

TABLE 6.2-16 (Cont'd)

(9) Post-Accident valve position (open or closed) is the position during the initial 10 minutes after an accident.

(10) Shutdown valve position (open or closed) is the position beyond the initial 10 minutes after an accident.

(11) The ESF System designation is applied to primary containment penetrations that are a part of an ESF System and where that part of the system provides or aids a function that is characteristic of an ESF System. Although reactivity control systems are not usually characterized as being ESF Systems, in this table reactivity control system penetrations are given the ESF system designation.

(12) Manual indicates remote manual initiation of valve closure from the main control room, unless indicated otherwise.

(13) The valve is closed by remote manual initiation from the main control room.

(14) Operation is by local manual hand wheel.

(15) The valve closure times are indicative of the valves rated capabilities. Maximum valve closure times are given in Chapter 16.

(16) The valve actuator is only used to exercise the valve disk during testing.

(17) Remote manual initiation capability is provided in the main control room for air-assisted closure.

TABLE 6.2-25

PENETRATIONS USING A CLOSED SYSTEM OUTSIDE PRIMARY CONTAINMENT AS A SECOND ISOLATION BARRIER

Containment Penetration Number	Line Isolated	Justification(1)
~~P-4A, 4B~~	~~RHR Shutdown Cooling Return~~	~~a~~ e
~~P-5A, 5B~~	~~Core Spray to Reactor~~	~~a~~ e
~~P-6A thru 6D~~	~~RHR Low Pressure Coolant Injection~~	~~a~~ e
P-201	Vacuum Breaker Network Branch	a, c, d
P-202	HPCI Pump Suction	a,c
P-203	HPCI Minimum Return	a,c
P-204	HPCI & RCIC Vacuum Breaker Network	a,d
P-207	Vacuum Breaker Network Branch	a, c, d
P-208	RCIC Pump Suction	a,c
P-209	RCIC Minimum Return	a,c
P-211A thru 211D	RHR Pump Suction	a,c
P-212A, 212B	RHR Suppression Pool Cooling & System Test	a,c
P-213A, 213B	Vacuum Breaker Network Branch ~~RHR Relief to Suppression Pool~~	a,c,d
P-214A, 214B	RHR to Suppression Pool Spray Header	a
P-216A thru 216D	Core Spray Pump Suction	a,c
P-217A, 217B	Core Spray Test to Suppression Pool	a,c
P-228, J-209, J-217, J-219	Suppression Pool Water Level	b

Notes:

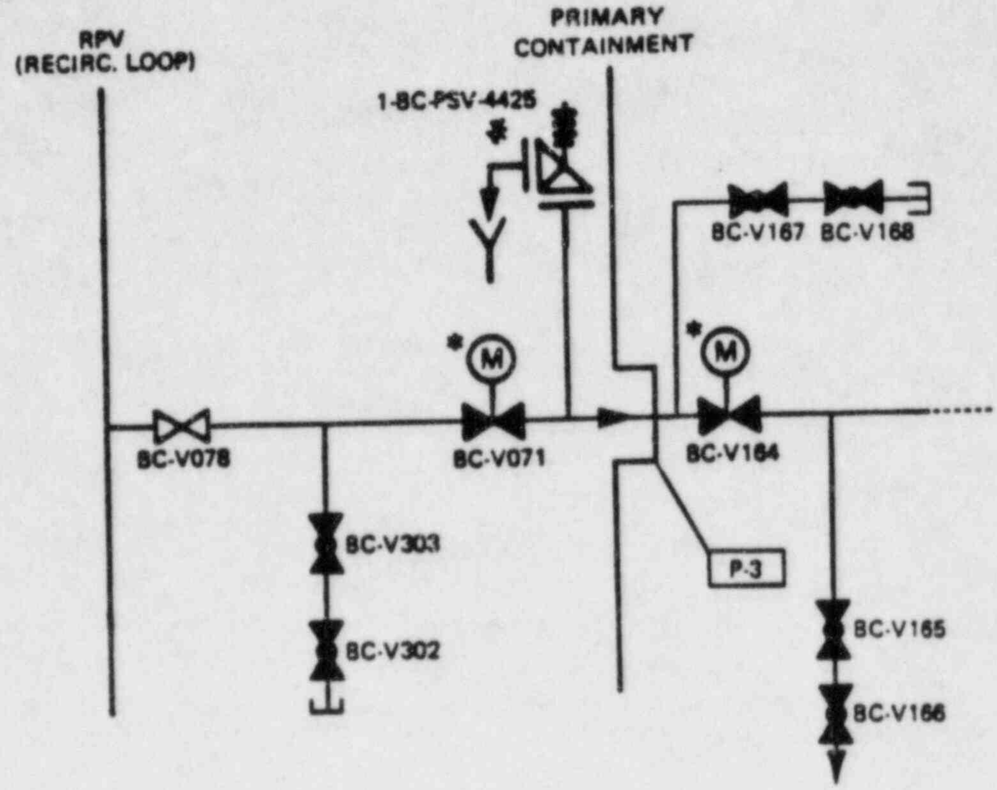
(1) Justifications:

a. A single isolation valve is used because the system provides or aids the emergency passage of fluids into and out of primary containment. The addition of a second containment isolation valve decreases the reliability of the system by providing an additional source of active failure.

b. A single isolation valve is used because a second isolation valve would not add to the dependability of the containment boundary. These instrument lines are a reliable containment boundary. To add a second containment isolation valve would lengthen the containment boundary without a subsequent increase in the dependability of the containment boundary.

c. The line to the suppression pool is always submerged so that the primary containment atmosphere cannot impinge upon the valve.

d. the isolation provisions that are shared in common between containment penetrations P-201, P-204, P-207, P-213 A, and P-213 B, can be shown to provide isolation by redundant primary containment isolation valves, as an alternative to considering the vacuum breaker network as a closed system.



DETAIL 3

*(SEE LEGEND)

HOPE CREEK
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RHR SHUTDOWN COOLING SUCTION LINE

FIGURE 6.2-38
SHEET 3 OF 48

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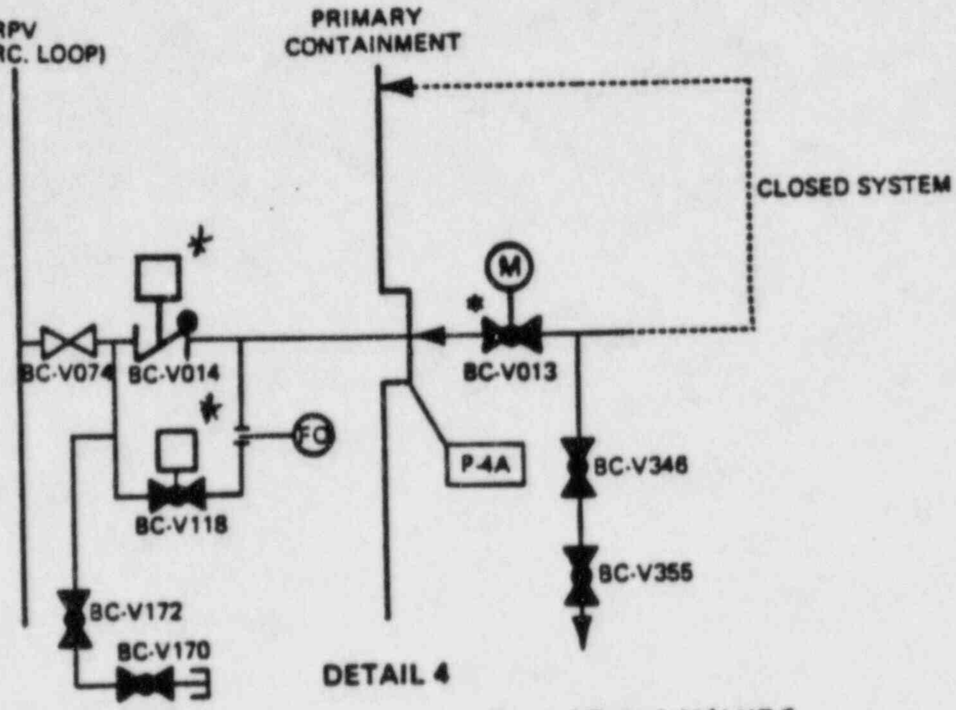

DETAIL 4

ISOLATION VALVES

P-4A	P-4B
BC-V013	BC-V110

TEST/DRAIN VALVES

P-4A	P-4B
BC 172	V169
BC-170	V171
BC-V346	V334
BC-V355	V335
BC-V074	V183
BC-V118	V117

OTHER VALVES

P-4A	P-4B
BC-V014	V111

ISOLATION VALVES

P-4A	P-4B
BC-V014	V111
BC-V013	V110
BC-V118	V117

*(SEE LEGEND)

HOPE CREEK
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RHR SHUTDOWN
COOLING RETURN LINES

FIGURE 6.2-28
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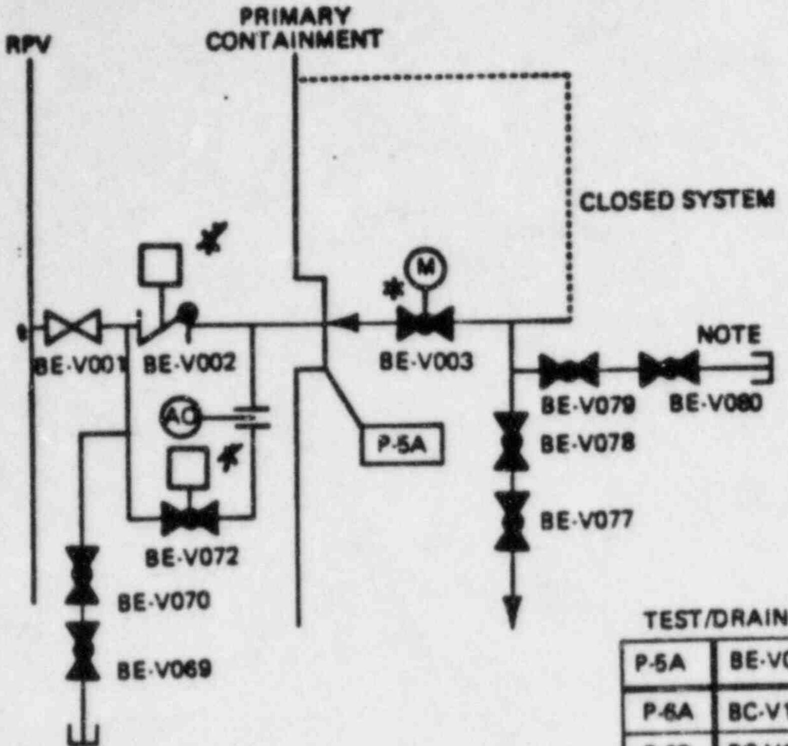


~~OTHER VALVES~~

~~P-5A~~	~~BE-V002~~
~~P-6A~~	~~BC-V005~~
~~P-6B~~	~~BC-V017~~
~~P-6C~~	~~BC-V114~~
~~P-6D~~	~~BC-V102~~

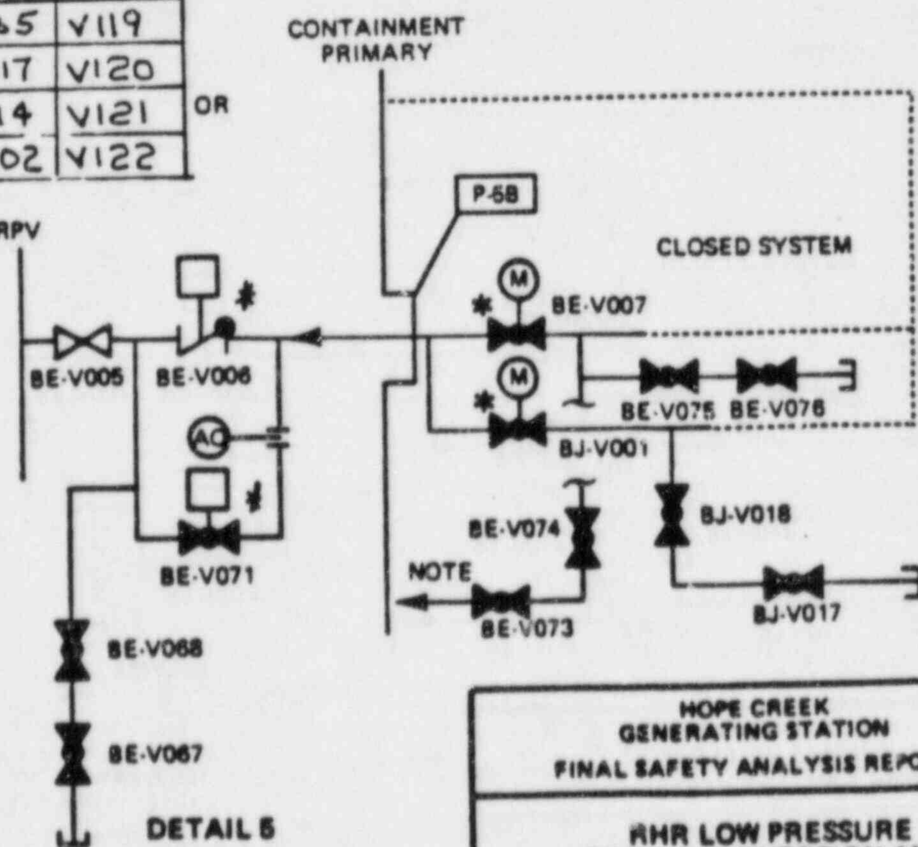
TEST/DRAIN VALVES

P-5A	BE-V070	V069	V078	V077	~~V072~~	V001
P-6A	BC-V173	V177	V320	V321	~~V119~~	V076
P-6B	BC-V174	V178	V324	V325	~~V120~~	V075
P-6C	BC-V175	V179	V353	V354	~~V121~~	V182
P-6D	BC-V176	V180	V332	V333	~~V122~~	V181

ISOLATION VALVES

P-5A	BE-V003	V002	V072
P-6A	BC-V004	V065	V119
P-6B	BC-V016	V017	V120
P-6C	BC-V113	V114	V121
P-6D	BC-V101	V102	V122

OR



DETAIL 5

NOTE:
FOUND ON CORE SPRAY SYSTEM ONLY.

*(SEE LEGEND)

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RHR LOW PRESSURE COOLANT INJECTION AND CORE SPRAY DISCHRGE LINE

FIGURE 6.2-28
SHEET 5 OF 48

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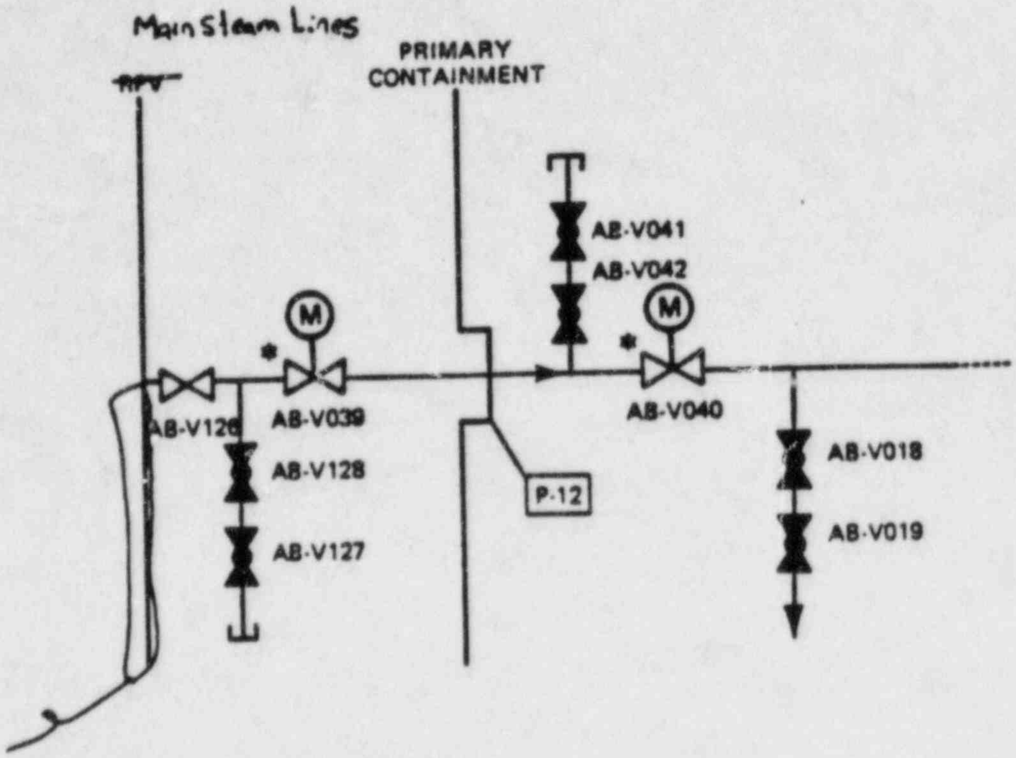

DETAIL 9

*(SEE LEGEND)

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MAIN STEAM DRAIN LINE

FIGURE 6.2-28
SHEET 9 OF 48

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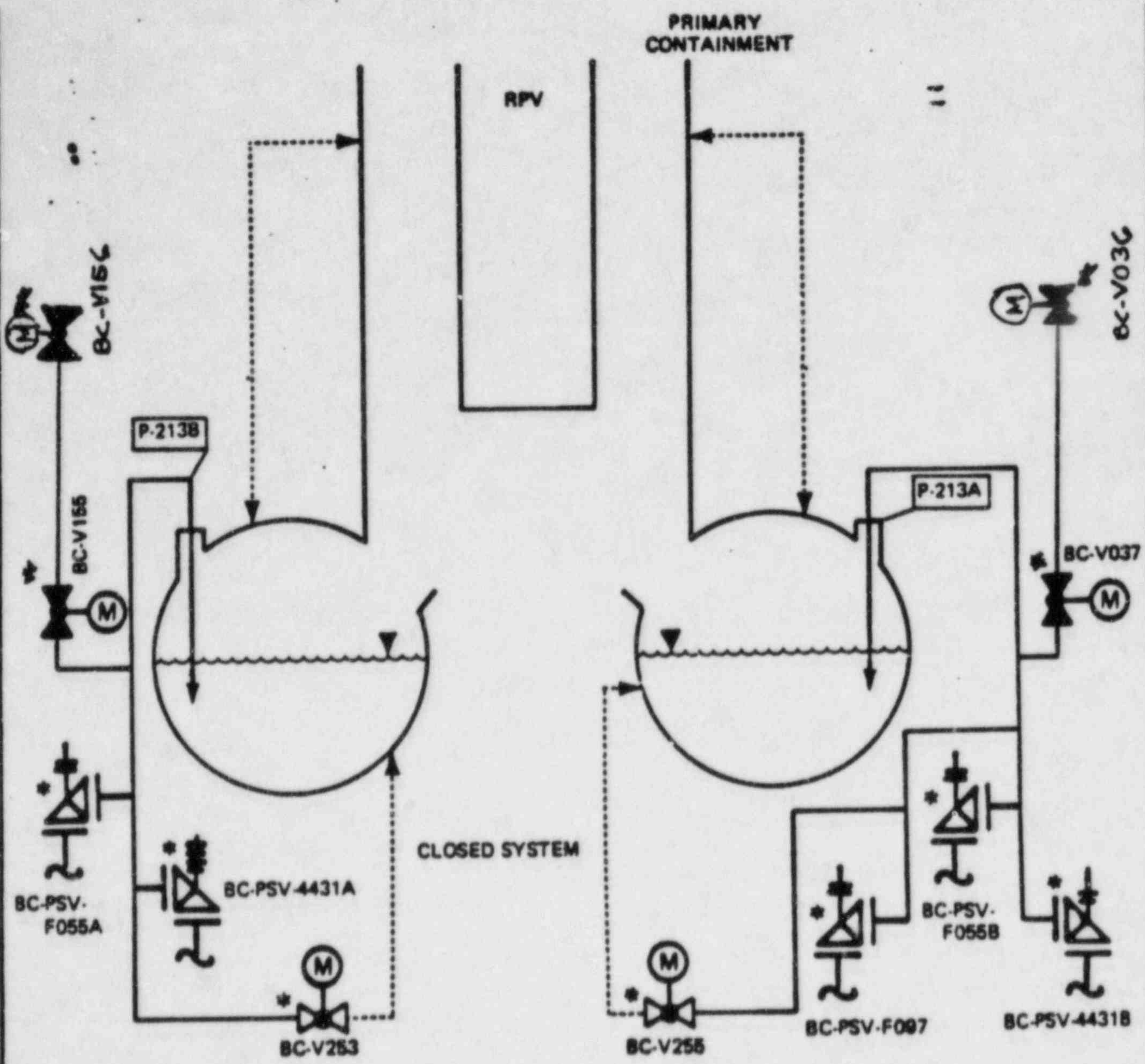

DETAIL 27

*(SEE LEGEND)

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RHR RELIEF TO
SUPPRESSION CHAMBER LINES

FIGURE 6.2-28
SHEET 27 OF 46

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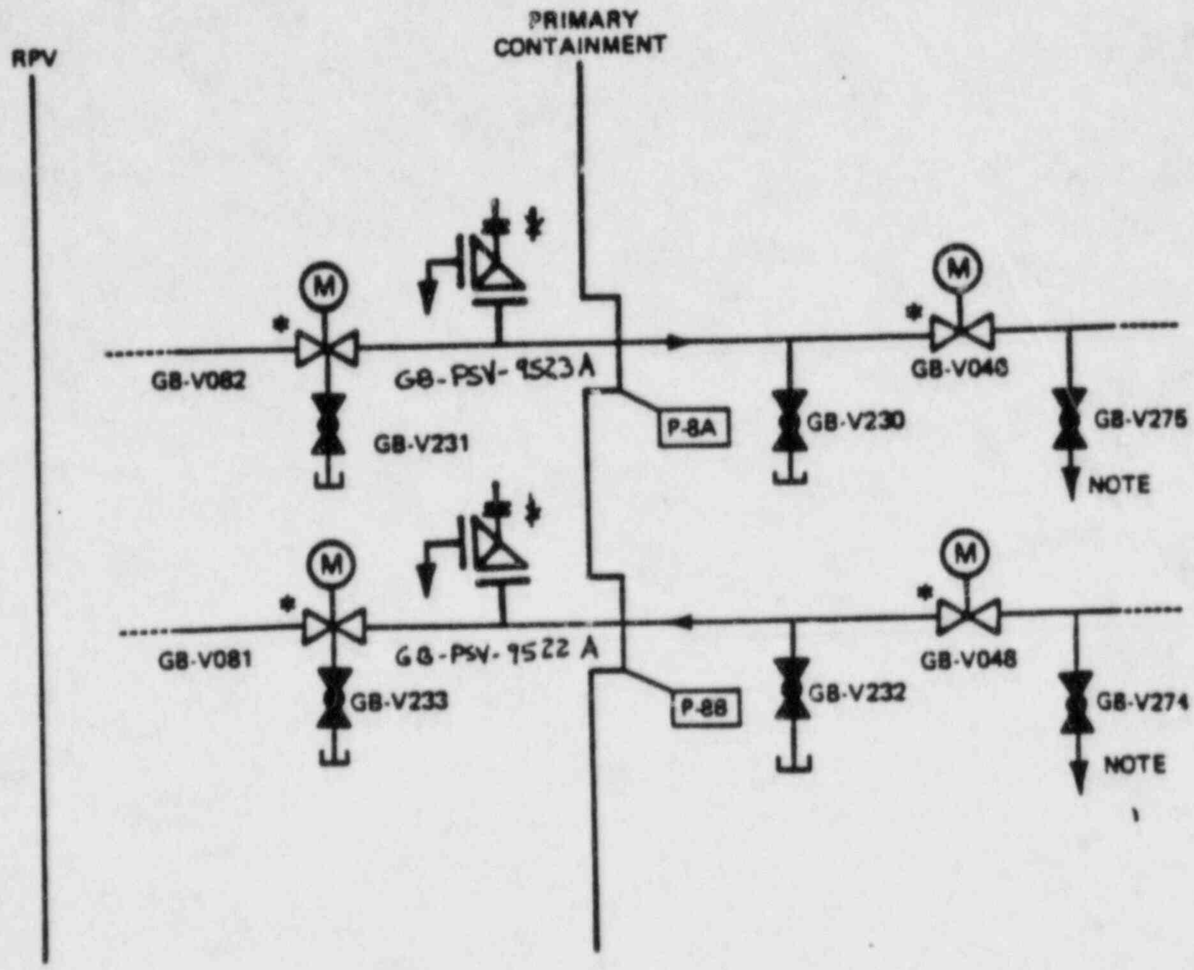

DETAIL 34

ISOLATION VALVES

P-8A	GB-V082	GB-V046	GB-PSV-9523 A
P-38B	GB-V084	GB-V071	GB-PSV-9523B

ISOLATION VALVES

P-8B	GB-V081	GB-V048	GB-PSV-9522 A
P-38A	GB-V083	GB-V070	GB-PSV-9522

TEST VALVES

P-8A	GB-V231	GB-V230	GB-V275
P-38B	GB-V237	GB-V236	GB-V241

TEST VALVES

P-8B	GB-V233	GB-V232	GB-V274
P-38A	GB-V235	GB-V234	GB-V240

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CHILLER WATER SYSTEM LINES

*(SEE LEGEND)

NOTE:
THIS IS A TEST TAP ON P-38A AND P-38B

FIGURE 6.2-28
SHEET 34 OF 48

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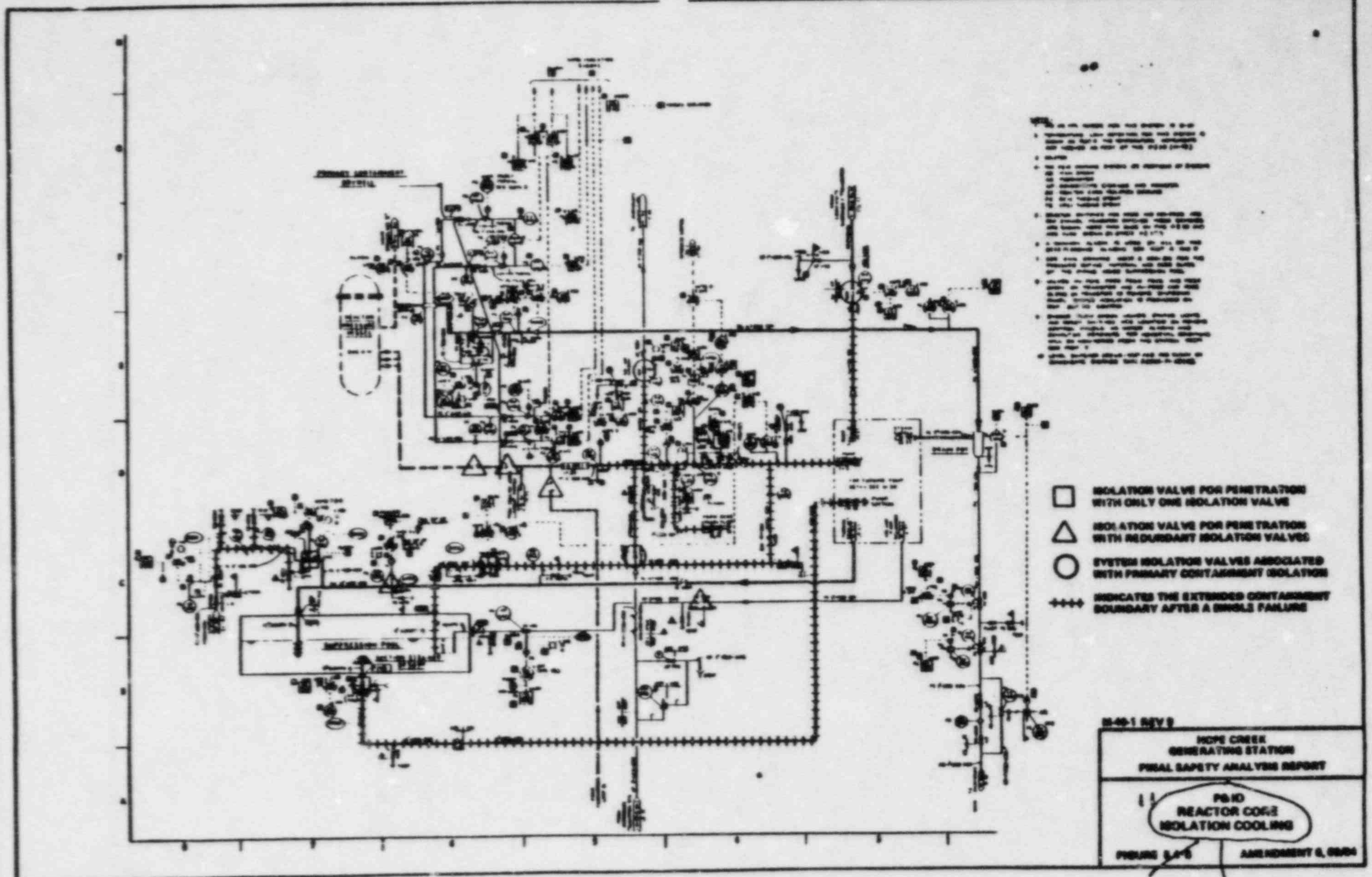
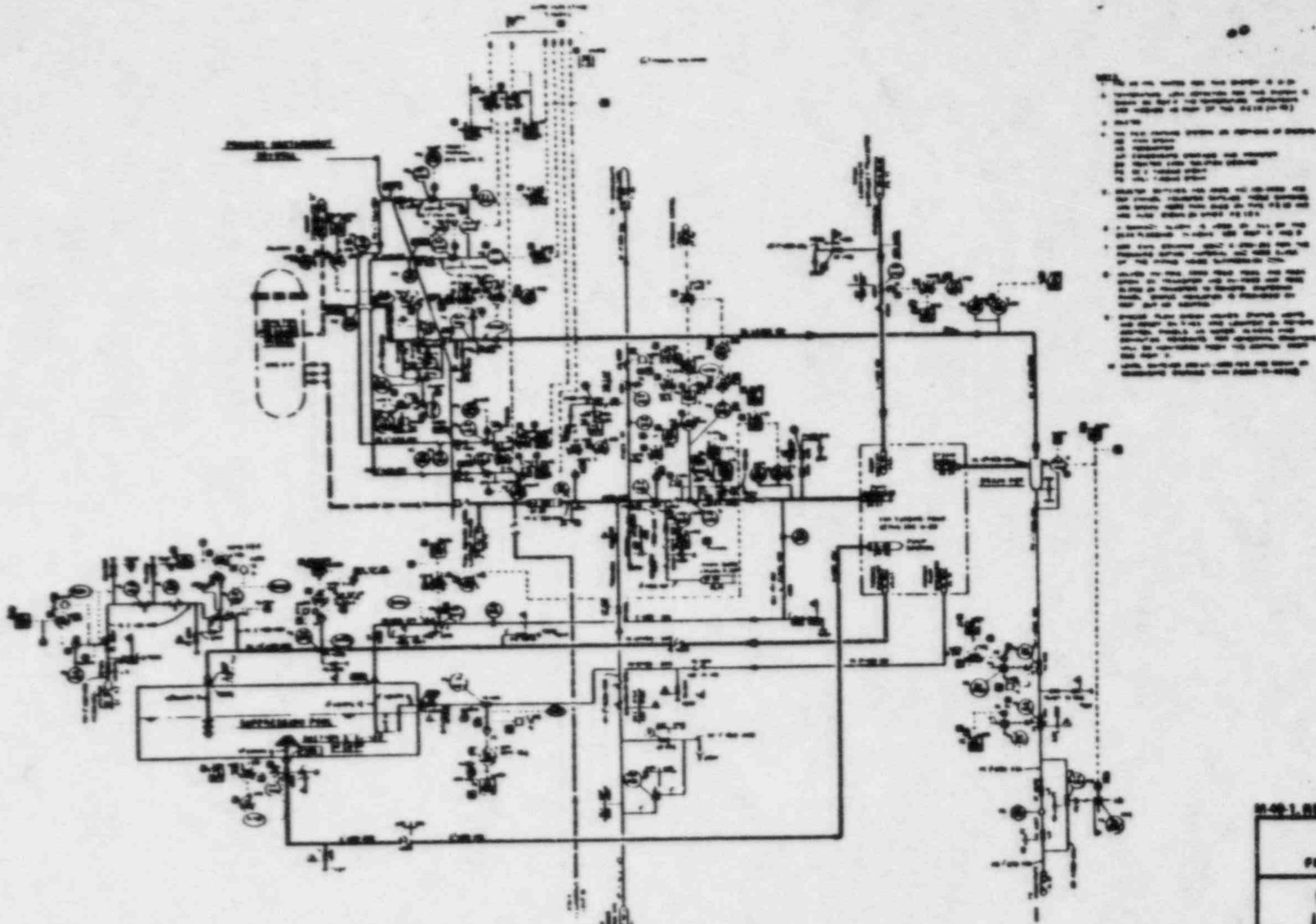


6.2-45

title is ok for Fig 5.4



HOPE CREEK GENERATING STATION

FINAL SAFETY ANALYSIS REPORT

RCIC AS AN EXTENDED CONTAINMENT BOUNDARY

FIGURE
SHEET 1 OF 2

5.4-8

Title is correct for Fig 6.2-45 Sh 1

QUESTION 480.14 (SECTION 6.2.3)

Provide the following additional information related to potential bypass leakage paths given in Table 6.2-15.

a. For each air or water seal demonstrate that a sufficient inventory of the fluid is available to maintain the seal 30 days following onset of a LOCA. Note that the suppression pool cannot be considered a water seal. Describe the testing and proposed entries for the Technical Specifications that will verify the assumptions used in the analyses.

b. For each path where water seals eliminate the potential for bypass leakage, provide a sketch to show the location of the water seal relative to the system isolation valves.

RESPONSE

HCGS does consider the suppression pool to be an effective water seal. The suppression pool is a reliable source of water that can provide the required separation between the primary containment atmosphere and the environs. The suppression chamber's structural design is discussed in Section 3.8.2. Thus, we have considered it to be a water seal as indicated in Section 6.2.3.

Below is an item by item discussion of the ability of the air and water seal barriers identified in Table 6.2-15 to maintain sufficient inventory for 30 days following a LOCA. For those valves maintaining a water seal, calculations have been done to verify that there is sufficient inventory for 30 days assuming leakage rates of 10 ml/h per inch of nominal valve diameter, unless otherwise indicated below (Reference 1). Except for HPCI valves FD-V017 and FD-V003, RCIC valves FC-V021 and FC-V015, and RACS valves ED-V003 and ED-V004, all valves required to maintain a water seal are 10 CFR 50 Appendix J, Type C tested. Those valves that are not Type C tested will be identified in the technical specifications as requiring periodic leakage testing in order to ensure the existence of the water seal.

Main Steam - A positive air seal is maintained through the operation of the MSIV sealing system as discussed in Section 6.7.

Feedwater Line - There is sufficient water inventory for a 30-day seal. ~~assuming a leakage rate of 40 ml/h per inch of nomial valve diameter for valves AE-V003 and AE-V007.~~ Figure 480.14-1 is provided to show the location of the water seal relative to the system isolation valves. The ECCS and RCIC jockey pumps can be used to provide makeup should it be necessary.