ATTACHMENT 1

CHANGES TO TECHNICAL SPECIFICATIONS

FINAL DRAFT

TABLE 3.6-1 (Continued)

CONTAINMENT ISOLATION VALVES

VALVE NO.	FSAR TABLE REFERENCE NO.*	LINE OR SERVICE	ISOLATION TIME (Seconds)	TYPE LEVEL TESTING
4. Manual Valves (Continued)				
1SF-011	56	Refueling Water Purification to Refueling Cavity	N.A.	C
1SF-012	56	Refueling Water Purification to Refueling Cavity	N.A.	C
1SF-021	67	To Refueling Water Purification Pump	N.A.	C
1SF-022	67	To Refueling Water Purification Pump	N.A.	C
1SF-053	71	Refueling Cavity Skimmer Pump	N.A.	C
1SF-054	71	Refueling Cavity Skimmer Pump	N.A.	C
→ INSERT (A)				
5. Power-Operated Isolation Valves				
1HV-2452-1	4	Main Steam to Aux. FPT From Steam Line #1	N.A.	Note 1
1PV-2325	5	Main Steam From Steam Generator #1	N.A.	Note 1
1PV-2326	9	Main Steam From Steam Generator #2	N.A.	Note 1
1PV-2327	13	Main Steam From Steam Generator #3	N.A.	Note 1
1HV-2452-2	17	Main Steam to Aux. FPT From Steam Line #4	N.A.	Note 1
1PV-2328	18	Main Steam From Steam Generator #4	N.A.	Note 1
1HV-2491A	20a	Main & Auxiliary Feedwater to Steam Generator #1	N.A.	Note 1

INSERT (A)

1HV-2333B	2	MSIV Bypass ~~Main Steam~~ From Steam Generator #1	5 N.A.	Note 1, 11
1HV-2334B	7	MSIV Bypass ~~Main Steam~~ From Steam Generator #2	5 N.A.	Note 1, 11
1HV-2335B	11	MSIV Bypass ~~Main Steam~~ From Steam Generator #3	5 N.A.	Note 1, 11
1HV-2336B	15	MSIV Bypass ~~Main Steam~~ From Steam Generator #4	5 N.A.	Note 1, 11

TABLE 3.6-1 (Continued)

CONTAINMENT ISOLATION VALVES

FINAL DRAFT

VALVE NO.	FSAR TABLE REFERENCE NO.*	LINE OR SERVICE	ISOLATION TIME (Seconds)	TYPE LEVEL TESTING
6. Check Valves (Continued)				
1-8841B	63	RHR to Hot Leg Loops #2 and #3	N.A.	Note 2
1SI-8968	104	N_2 Supply to Accumulators	N.A.	C
1CA-016	113	Service Air to Containment	N.A.	C
1CC-629	117	CC Return From RCP's Motors	N.A.	C
1CC-713	118	CC Supply to RCP's Motors	N.A.	C
1CC-831	119	CC Return From RCP's Thermal Barrier	N.A.	C
1CH-024	120	Chilled Water Supply to Containment Coolers	N.A.	C
7. Steam Line Isolation Signal				
1HV-2333A	1	Main Steam From Generator #1	5	Note 1 Note 10
1HV-2333B	2	Main Steam From Generator #1	5	Note 1
1HV-2409	3	Drain From Main Steam Line #1	5	Note 1
1HV-2334A	6	Main Steam From Steam Generator #2	5	Note 1 Note 10
1HV-2334B	7	Main Steam From Steam Generator #2	5	Note 1
1HV-2410	8	Drain From Main Steam Line #2	5	Note 1
1HV-2335A	10	Main Steam From Steam Generator #3	5	Note 1 Note 10

FINAL DRAFT

TABLE 3.6-1 (Continued)

CONTAINMENT ISOLATION VALVES

VALVE NO.	FSAR TABLE REFERENCE NO.*	LINE OR SERVICE	ISOLATION TIME (Seconds)	TYPE LEVEL TESTING
7. Steam Line Isolation Signal (Continued)				
1HV-2335B	11	Main Steam From Steam Generator #3	5	Note 1 Note 10
1HV-2411	12	Main Steam From Steam Generator #3	5	Note 1
1HV-2336A	14	Main Steam From Steam Generator #4	5	Note 1 Note 10
1HV-2336B	15	Main Steam From Steam Generator #4	5	Note 1
1HV-2412	16	Drain from Main Steam Line #4	5	Note 1
8. Feedwater Line Isolation Signal				
1HV-2134	19	Feedwater to Steam Generator #1	5	Note 1
1FV-2193	20d	Feedwater Tempering Line	5	Note 1 Note 9
1HV-2185	20e	Feedwater Bypass Line	5	Note 1
1HV-2135	21	Feedwater to Steam Generator #2	5	Note 1
1FV-2194	22d	Feedwater Tempering Line	5	Note 1 Note 9
1HV-2186	22e	Feedwater Bypass Line	5	Note 1
1HV-2136	23	Feedwater to Steam Generator #3	5	Note 1
1FV-2195	24d	Feedwater Tempering Line	5	Note 1 Note 9
1HV-2187	24e	Feedwater Bypass Line	5	Note 1
1HV-2137	25	Feedwater to Steam Generator #4	5	Note 1

TABLE NOTATIONS

Note 8: These valves located outside containment are normally closed and see a pressure in excess of containment pressure in post-accident conditions. A valve stem leakage check will be performed on a quarterly basis to assure no significant stem leakage would occur in post-accident conditions.

Note 9: These valves are classified as "passive" in accordance with Specification 4.0.5 and are stroke time-tested only following maintenance which could effect the stroke time of the valve.

Note 10: These valves require steam to be tested and are thus not required to be tested until the plant is in MODE 3.

Note 11: All four MSIV Bypass Valves are locked closed in Mode 1. During Modes 2, 3 and 4 one MSIV Bypass Valve may be opened provided the other three MSIV Bypass Valves and their associated MSIV's are closed.

CONTAINMENT VENTILATION SYSTEM (Continued)

before gross leakage failures could develop. The 0.60 L_a leakage limit of Specification 3.6.1.2b shall not be exceeded when the leakage rates determined by the leakage integrity tests of these valves are added to the previously determined total for all valves and penetrations subject to Type B and C tests.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the Containment Spray System ensures that containment depressurization and cooling capability will be available in the event of a LOCA or steam line break. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the safety analyses.

The Containment Spray System, which is composed of two redundant trains, provides post-accident cooling of the containment atmosphere. However, the Containment Spray System also provides a mechanism for removing iodine from the containment atmosphere and therefore the time requirements for restoring an inoperable Spray System to OPERABLE status have been maintained consistent with that assigned other inoperable ESF equipment.

3/4.6.2.2 SPRAY ADDITIVE SYSTEM

The OPERABILITY of the Spray Additive System ensures that sufficient NaOH is added to the containment spray in the event of a LOCA. The limits on NaOH volume and concentration ensure a pH value of between 8.5 and 11.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components. The contained solution volume limit includes an allowance for solution not usable because of tank discharge line location or other physical characteristics. These assumptions are consistent with the iodine removal efficiency assumed in the safety analyses.

3/4.6.3 CONTAINMENT ISOLATION VALVES

The OPERABILITY of the containment isolation valves ensures that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment and is consistent with the requirements of GDC 54 through 57 of Appendix A to 10 CFR Part 50. Containment isolation within the time limits specified for those isolation valves designed to close automatically ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a LOCA.

→ INSERT (B)

3/4.6.4 COMBUSTIBLE GAS CONTROL

The OPERABILITY of the equipment and systems required for the detection and control of hydrogen gas ensures that this equipment will be available to maintain the hydrogen concentration within containment below its flammable

INSERT B

Table 3.6-1 lists manual containment isolation valves also. During plant operations requiring containment integrity, the manual valves may be opened under administrative controls and restrictions noted in Table 3.6-1.

ATTACHMENT 2

CHANGES TO FSAR SECTIONS
1.3, 3.9B, 3A
6.2, 7.3, 7.4
AND
10.3

FSAR SECTION 1.3

COMPARISION TABLES

DESIGN CHANGES SINCE FSAR SUBMITTAL

Systems or Components	CPSES/FSAR Section	Changes
Steam and power conversion system	10.1	The steam dump system to the condenser from the steam generator is not a safety-related feature included in the steam and power conversion system.
Turbine-generator	10.2	Added Occupational Safety and Health Act (OSHA) to codes and standards.
		The worst case accident, a failure of the cast stage of the low pressure turbine rotor, is analyzed.
		The following have been added to the list of events that initiate a turbine trip: 1. Reactor trip 2. Steam generator high-high level 3. Safety injection 4. Generator trip 5. Moisture separator high level (each MSR) 6. Excessive vibration during speed operation from 900 rpm until unit is synchronized.

10.3	The Main Steam Isolation Valves (MSIV) Bypass Valves were converted from automatic to manual. The hydraulic actuators were deleted and handwheels installed. The valves are capable of being locked in position.

FSAR SECTION 3.9B

MECHANICAL SYSTEMS AND COMPONENTS

ASME CODE CLASS 2 AND CLASS 3
ACTIVE AND INACTIVE PUMPS AND VALVES

Component	Class	Operation*
Main Steam Reheat and Steam Dump System		
Main Steam System Valves		
a. Main steam isolation valves	2	A
b. Main steam isolation bypass valves	2	A/I
c. Main steam safety and relief valves	2	A
d. Pneumatically operated valves	2/3	A/I
e. Locked-closed manual valves	2	I
f. Instrument root valves	2/3	I
g. Test connection valves	2	I
h. Instrument drain and vent valves	2/3	I
i. Manual valves	2/3	I
Feedwater System		
Feedwater system valves from containment isolation valves to the steam generators	2	A
Safety Injection System		
Safety injection system valves	2	A

* A = active; I = inactive

CPSES/FSAR
TABLE 3.9B-10

ACTIVE VALVES

VALVE IDENTIFICATION OR LOCATION NO.	SYSTEM	VALVE TYPE AND ACTUATOR	SIZE IN.	ANS SAFETY CLASS	METHOD OF ACTUATION	NORMAL POSITION	FUNCTION
HV-2333A	MS	Globe Hydraulic	32	2	Auto Trip	Open	Containment Isolation
HV-2333B	MS	Globe Hydraulic[a] Manual	4	2	Auto Trip[a] Manual	Closed	Containment Isolation
HV-2409	MS	Globe/Air	2	2	Auto Trip	Open	Containment Isolation
HV-2452-1	MS	Globe/Air	4	2	Auto Trip	Closed	Containment Isolation
PV-2325	MS	Globe/Air	8	2	Remote Manual	Closed	Containment Isolation
HV-2334A	MS	Globe Hydraulic	32	2	Auto Trip	Open	Containment Isolation
HV-2334B	MS	Globe Hydraulic[a] Manual	4	2	Auto Trip[a] Manual	Closed	Containment Isolation
HV-2410	MS	Globe/Air	2	2	Auto Trip	Opened	Containment Isolation
PV-2326	MS	Globe/Air	8	2	Remote Manual	Closed	Containment Isolation
HV-2335A	MS	Globe Hydraulic	32	2	Auto Trip	Open	Containment Isolation
HV-2335B	MS	Globe Hydraulic[a] Manual	4	2	Auto Trip[a] Manual	Closed	Containment Isolation
HV-2411	MS	Globe/Air	2	2	Auto Trip	Open	Containment Isolation
PV-2327	MS	Globe/Air	8	2	Remote Manual	Closed	Containment Isolation
HV-2336A	MS	Globe Hydraulic	32	2	Auto Trip	Open	Containment Isolation
HV-2336B	MS	Globe Hydraulic[a] Manual	4	2	Auto Trip[a] Manual	Closed	Containment Isolation
HV-2412	MS	Globe/Air	2	2	Auto Trip	Open	Containment Isolation
HV-2452-2	MS	Globe/Air	4	2	Auto Trip	Closed	Containment Isolation
PV-2328	MS	Globe/Air	8	2	Remote Manual	Closed	Containment Isolation
HV-2397	MS	Globe/Air	3	2	Auto Trip	Open	Containment Isolation
HV-2398	MS	Globe/Air	3	2	Auto Trip	Open	Containment Isolation
HV-2399	MS	Globe/Air	3	2	Auto Trip	Open	Containment Isolation

FSAR SECTION 3A

ENVIRONMENTAL QUALIFICATION REPORT

ES13D (5 of 5)*	Class 1E Connectors	Certified	47
ES13E*	600V Power and Control with Silicone	Certified	
ES16A*	Radiation Monitors	Certified	
ES18	Relay Panels, Boards and Racks	Certified	
ES22A	Solid State Sequencers	Certified	
ES24	Solid State Isolation Equipment	Certified	
ES28*	Conduit Seals	Certified	
ES29 (1 of 4)*	Limit Switches	Certified	
ES29 (2 of 4)	Limit Switches	Certified	
ES29 (3 of 4)	Limit Switches	Certified	
ES29 (4 of 4)*	Limit Switches	Certified	
ES100 (1 of 4)	8KV Termination Assemblies and Splices	Certified	
ES100 (2 of 4)*	600V Heat Shrink & Splice Kits	Certified	
ES100 (3 of 4)	8KV Motor Splices	Certified	
ES100 (4 of 4)*	Terminal Blocks	Certified	
SS15*	Airlock Electrical Penetration Assemblies	Certified	
MS7	Turbine Driven Auxiliary Feedwater Pump Control Panel	Certified	50
MS13	Medium Pump Motors	Certified	
MS15A	RWM Pump Motors	Certified	
MS15B	Sump Pump Motors	Certified	
MS15C	Small and Medium Pump Motors - CW	Certified	
MS20B	Motor Operated Valves - Operator	Certified	
MS20B (ES29)	Motor Operated Valves - Limit Switches	See ES29	
MS20B.1 (1 of 2)	Pneumatic Hydraulic Operator	Certified	
MS20B.1 (2 of 2)*	Motor Operated Valves - Operator	Certified	
MS20B.2	Motor Operated Valves - Operator	Certified	47
MS20B.1 (ES29)*	Motor Operated Valves - Limit Switches	See ES29	
MS34 (1 of 3)	Emergency Generator	Certified	
MS34 (2 of 3)	Emergency Diesel Control Panel	Certified	
MS34 (3 of 3)	Emergency Generator Control Panel	Certified	
MS76 (1 of 3)	Deleted		52
MS76 (2 of 3)	MSIV's - Bypass Operator	Certified	
MS76 (3 of 3)	MSIV's - Rockwell Operator	Certified	49

CPSES/EQR

BOP ENVIRONMENTAL QUALIFICATION SUMMARY DATA

TABLE 5-1

(Sheet 3)

EQUIPMENT TYPE/CATEGORY	LOCATION STRUCTURE/AREA	MANUFACTURER TYPE/MODEL	ABNORMAL/ACCIDENT ENVIRONMENTAL EXTREMES PARAMETER	POSTULATED	QUALIFIED(2)	OPERABILITY(1) REQ(3)	DEM	ACCURACY REQ	DEM	QUAL LIFE	QUAL METHOD	REF	PURCHASE SPEC	
Transducer Main Steam Relief Valves Main Steam Supply System category d	Safeguard bldg./El. 877'6"	Fisher Type 546 Transducer	Temp Pressure Rel. Humid Radiation Chemistry	120°F(5) Atmos 100% 1.15×10^3R(g) None	320°F Atmos 75% 1.04×10^7R(g) None	Acc Dur 1 yr	Acc Dur 1 yr	20 sec (valve time)	3.9 sec stroke	6 YR	Comb Test Anl		MS-78	50
Main Steam Isol. Valve Bypass Operator Main Steam Supply System category a	Safeguards bldg./main steam compartment El. 877' 6"	Paul Monroe Electro Hydraulic Operator VOL 38U	Temperature Pressure Rel. Humid. Radiation Chemistry	335°F 15.3 psig 100% 1.15×10^3R(g) None	365°F 60 psig 100% 112×10^6R(g) spray N/A	Acc Dur MSLB 605 sec	Acc Dur MSLB 1 HR	N/A	N/A	40 YR (10)	Comb Test Anl		MS-76 2 of 3	52 47
Main Steam Isol. Valve Limit Switch Main Steam	Safeguards bldg./main steam compartment	NAMCO Model EA740	Temperature Pressure Rel. Humid. Radiation Chemistry	335°F 15.3 psig 100% 1.15×10^3R(g) None	(See ES29 4 of 4 for demonstrated values)	Acc Dur MSLB 605 sec		N/A	N/A				MS-76 (ES29 4 of 4)	46

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FSAR SECTION 6.2

CONTAINMENT SYSTEMS

TABLE 6.2.4-2
(Sheet 1 of 10)

CONTAINMENT ISOLATION VALVING APPLICATION

Item	Isolation Valve No.	Location in Relation to Containment	Type of Leakage Rate Test	Length of Pipe to Outermost Isolation Valve (ft)	Valve Type/Operator	Method of Actuation Primary	Secondary
1	HV-2333A	Outside	Note 1	40'	Y - Globe/Hydr. N2 Actuator	Auto close	Remote Manual
2	HV-2333B	Outside	Note 1	-	Globe/Hydr. Actuator Manual	Auto close Manual	Remote Manual N/A
3	HV-2409	Outside	Note 1	-	Globe/Air	Auto close	Remote Manual
4	HV-2452-1	Outside	Note 1	-	Globe/Air	Auto open	Remote Manual
5	PV-2325	Outside	Note 1	-	Globe/Air	Remote Manual	N/A
6	HV-2334A	Outside	Note 1	38'	Y - Globe/Hydr. N2 Actuator	Auto close	Remote Manual
7	HV-2334B	Outside	Note 1	-	Globe/Hydr. Actuator Manual	Auto close Manual	Remote Manual N/A
8	HV-2410	Outside	Note 1	-	Globe/Air	Auto close	Remote Manual
9	PV-2326	Outside	Note 1	-	Globe/Air	Remote Manual	N/A
10	HV-2335A	Outside	Note 1	40'	Y - Globe/Hydr. N2 Actuator	Auto close	Remote Manual
11	HV-2335B	Outside	Note 1	-	Globe/Hydr. Actuator Manual	Auto close Manual	Remote Manual N/A
12	HV-2411	Outside	Note 1	-	Globe/Air	Auto close	Remote Manual
13	PV-2327	Outside	Note 1	-	Globe/Air	Remote Manual	N/A
14	HV-2336A	Outside	Note 1	38'	Y - Globe/Hydr. N2 Actuator	Auto close	Remote Manual
15	HV-2336B	Outside	Note 1	-	Globe/Hydr. Actuator Manual	Auto close Manual	Remote Manual N/A
16	HV-2412	Outside	Note 1	-	Globe/Air	Auto close	Remote Manual

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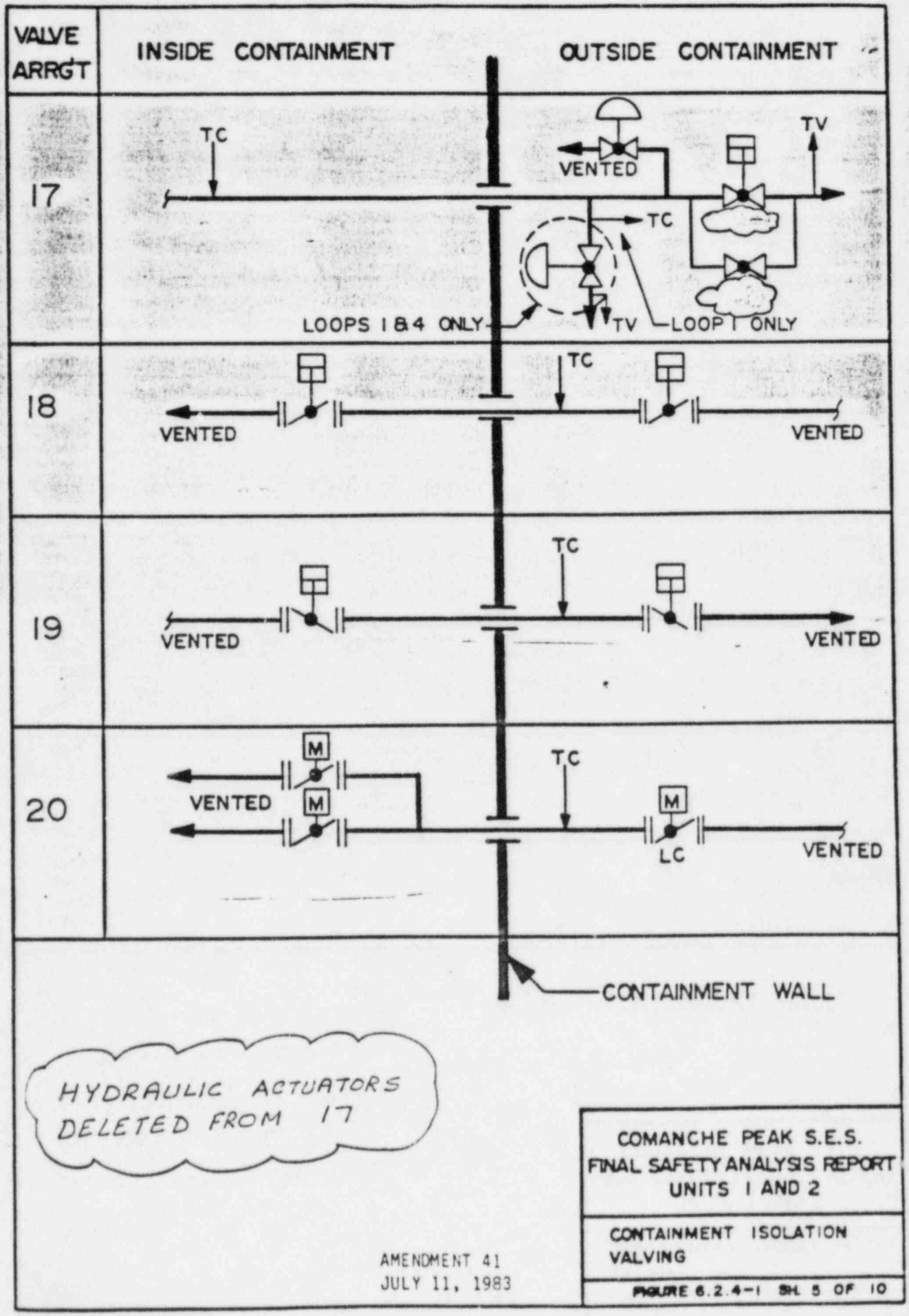
CONTAINMENT ISOLATION VALVING APPLICATION (Note 1) 42

Item	Containment Isolation Signal	Valve Position			Valve Power Failure	Valve Closure Time (Sec.)	Power Source	Remarks 14
		Normal	Shutdown	Post-Accident				
1	Steam Line Isolation	Opened	Closed	Closed	Closed	5	-	
2	Steam Line Isolation	Closed	Closed	Closed	Closed	(5)g N/A	-	Isolation Main Steam By-Pass Valve
3	Steam Line Isolation	Opened	Closed	Closed	Closed	5	-	
4	-	Closed	Opened	Opened	Opened	N/A	-	
5	-	Closed	Closed	Opened/ Modulation	Closed	N/A	-	
6	Steam Line Isolation	Opened	Closed	Closed	Closed	5	-	
7	Steam Line Isolation	Closed	Closed	Closed	Closed	(5)g N/A	-	Isolation Main Steam By-Pass Valve
8	Steam Line Isolation	Opened	Closed	Closed	Closed	5	-	
9	-	Closed	Closed	Opened/ Modulation	Closed	N/A	-	
10	Steam Line Isolation	Opened	Closed	Closed	Closed	5	-	

CONTAINMENT ISOLATION VALVING APPLICATION (Note 1) | 42

Item	Containment Isolation Signal	Valve Position			Valve Power Failure	Valve Closure Time (Sec.)	Power Source	Remarks	14
		Normal	Shutdown	Post-Accident					
11	Steam Line Isolation	Closed	Closed	Closed	Closed	(5) N/A	-	Isolation Main Steam By-Pass Valve	
12	Steam Line Isolation	Opened	Closed	Closed	Closed	5	-		
13	-	Closed	Closed	Opened/ Modulation	Closed	N/A	-		
14	Steam Line Isolation	Open	Closed	Closed	Closed	5	-		
15	Steam Line Isolation	Closed	Closed	Closed	Closed	(5) N/A	-	Isolation Main Steam By-Pass Valve	
16	Steam Line Isolation	Opened	Closed	Closed	Closed	5	-		
17	-	Closed	Opened	Opened	Opened	N/A	-		38
18	-	Closed	Closed	Opened/ Modulation	Closed	N/A	-		
19	Feedwater Isolation	Opened	Closed	Closed	Closed	5	-		
20	Phase A	Opened	Closed	Closed	Closed	5	-		
20a	-	Opened	Opened	Opened	Opened	N/A	-		42
	-	Opened	Opened	Opened	Opened	N/A	-		
20b	-	Closed	Opened	Closed	Closed	N/A	-		



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CONTAINMENT ISOLATION VALVING

FIGURE 6.2.4-1 SH. 5 OF 10

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JULY 11, 1983

FSAR SECTION 7.3

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM

7.3.2.2.7 Manual Initiation of Protective Actions (Regulatory Guide 1.62)

There are four individual main steam stop valve momentary control switches (one per loop) mounted on the control board. Each switch when actuated will isolate one of the main steam lines. In addition, there will be two system level switches. Each switch will actuate all four main steam line isolation and bypass valves of the system level. Manual initiation of switchover to recirculation is in compliance with Section 4.17 of IEEE Standard 279-1971 with the following comment.

Manual initiation of either one of two redundant safety injection actuation main control board mounted switches provides for actuation of the components required for reactor protection and mitigation of adverse consequences of the postulated accident, including delayed actuation of sequenced started emergency electrical loads as well as components providing switchover from the safety injection mode to the cold leg recirculation mode following a loss of primary coolant accident. Therefore, once safety injection is initiated, those components of the Emergency Core Cooling System (see Section 6.3) which are automatically realigned as part of the semiautomatic switchover go to completion on low-low refueling water storage tank (RWST) water level without any manual action. Manual operation of other components or manual verification of proper position as part of emergency procedures is not precluded nor otherwise in conflict with the above described compliance to Section 4.17 of IEEE Standard 279-1971 of the semiautomatic switchover circuits.

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No exception to the requirements of IEEE Standard 279-1971 has been taken in the manual initiation circuit of safety injection. Although Section 4.17 of IEEE Standard 279-1971 requires that a single failure within common portions of the protective system shall not defeat the protective action by manual or automatic means, the standard does not specifically preclude the sharing of initiated circuitry logic between automatic and manual functions. It is true that the manual safety

TABLE 7.3-2 (Sheet 2 of 2)

No.	Functional Unit	No. of Channels	No. of Channels to Trip
	d. Manual	2[a]	1[a]
3.	Feedwater line isolation		
	a. Safety injection	See item 1 of Table 7.3-1	
	b. Steam generator high-high level 2/3 on any steam generator	12(3/Steam generator)	2 in any one Steam generator
	c. Low T_{avg} (Average Temperature) Coincident with Reactor Trip	See Fig. 7.2-1 Sh. 2, 5 & 13	See Figure 7.2-1 Sh. 2, 5 & 13

[a] Additionally there is a switch for each loop that will actuate the mainsteam isolation and bypass valves for its respective loop.

FSAR SECTION 7.4

SYSTEMS REQUIRED FOR SAFE SHUTDOWN

INSTRUMENTATION AND CONTROL
LOCATED ON HOT SHUTDOWN PANEL
PROVIDED FOR HOT STANDBY (1)

Identification	Function
1/1-8801AF	(A) Charging pumps to Reactor Coolant System SIS isolation valve local control
43/1-8153FT	(A) Reactor Coolant System excess letdown valve remote local
1/1-8153FL	(A) Reactor Coolant System excess letdown valve local control
1/1-8110FL	(A) Charging pump miniflow isolation valve local control
1/1-8701AF	(A) RHR loop-1 inlet isolation valve local control
1/1-8701BF	(A) RHR Loop-2 inlet isolation valve local control
1-HS-2333FL	(A) Main Steam loop-1 isolation and bypass valves local control
1-HS-2334FL	(A) Main Steam loop-2 isolation and bypass valves local control
1-HS-2335FL	(A) Main Steam loop-3 isolation and bypass valves local control
1-HS-2336FL	(A) Main Steam loop-4 isolation and bypass valves local control
1/1-455AFL	(A) Pressurizer power relief valve local control
1-HS-6700FL	(A) Chilled water recirculation pump 5 local control
CS/BT-1EA1L	(A) Tie breaker 8T-1EA1 local control
CS/T1EB1L	(A) Buss 1EA1 transfer T1EB1 feeder breaker local control
CS/1EB1-1L	(A) Incoming breaker 1EB1-1 local control
CS/T1EB3L	(A) Bus 1EA1 transfer T1EB3 feeder breaker local control
CS/1EB3-1L	(A) Incoming breaker 1EB3-1 local control

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TRANSFER SWITCHES LOCATED ON SHUTDOWN TRANSFER PANEL (STP)

Identification	Function
43/1-8106FT	(A) Charging pumps to Reactor Coolant System isolation valve remote local
43/1-8801AF	(A) Charging pumps to Reactor Coolant System SIS isolation valve remote local
43/1-8149AL	(A) CVCS letdown orifice isolation valve remote local
43/1-8149BL	(A) CVCS letdown orifice isolation valve remote local
43/1-8149CL	(A) CVCS letdown orifice isolation valve remote local
43/1-8110FT	(A) Charging pump miniflow isolation valve remote local
43/1-APRH1F	(A) RHR pump-1 remote local
43/1-8701AF	(A) RHR loop 1 inlet isolation valve remote local
43/1-8701BF	(A) RHR loop 2 inlet isolation valve remote local
HS-2452B	Turbine-driven AFWP steam supply header #1 valve remote local
43/1-TCV-129	Letdown to demineralizer or volume control tank remote local
HS-2333FT	(A) Main Steam loop 1 isolation and bypass valves remote local
HS-2334FT	(A) Main Steam loop 2 isolation and bypass valves remote local
HS-2335FT	(A) Main Steam loop 3 isolation and bypass valves remote local
HS-2336FT	(A) Main Steam loop 4 isolation and bypass valves remote local
43/1-455AFT	(A) Pressurizer power relief valve remote local
43/1-PCPR1L	(A) Pressurizer heater backup group-A remote local
HS-XT	(A) Water chiller control remote local

FSAR SECTION 10.3

MAIN STEAM SUPPLY SYSTEM

The valves fail closed on loss of air or electric signal. Valve positions, open or closed, are indicated with control board lights. Failure of the relief valves to open causes the system pressure to rise to the set point of the first safety valve, which would then open, preventing further pressurization of the system. The power-operated relief valves do not provide main steam supply system overpressure protection. This overpressure protection is provided entirely by the safety valve system described previously. Valves are designed to pass a total flow of 10 percent of the plant design flow at the pressure corresponding to steam generator no-load conditions. The maximum capacity of any one valve does not exceed the flow rate (specified by the steam generator manufacturer) at the design pressure of the main steam supply system in order to limit reactivity insertion caused by the negative temperature coefficient of the core.

The valves discharge to the atmosphere and are designed to operate over the steam pressure range of 125 to 1300 psia. Each valve inlet pipe is provided with one manual isolation valve for maintenance.

Table 10.3-3 shows the design bases of the power-operated relief valves.

10.3.2.3 Main Steam Isolation Valves

10.3.2.3.1 General

Each main steam line is provided with a quick-acting isolation valve, and is designed to stop flow from either direction within 10 sec after a steam line break (five sec after receiving the closing signal) to prevent uncontrolled steam release from more than one steam generator. The valves are installed outside the Containment, downstream of the safety valves, and are provided with an integral 4-in. bypass valve for warming the system and equalizing the pressure across the isolation valve. The bypass valve is also designed to stop flow from either locked closed during power operation.

direction. The MSIVs can be opened manually by the operator in the Control Room without opening the bypass valve.

Each MSIV is provided with a two-train module, three-position control switch mounted on the main control board. The switch has an electrical two-train module so that valves can be closed even if one train fails. The three switch positions are close, auto, and open, with spring return to auto position. Each MSIV also has a two-train module test switch to enable a valve to be closed to a 10 percent-closed position when tested. In addition to these control board mounted switches, there is a two-train module trip switch which can be used to trip all four MSIVs simultaneously. Trip switch positions are trip and auto, with spring return to auto.

Each MSIV bypass valve also has a two-train module open, close, and auto switch on the control board. The MSIV's and bypass valves are automatically closed on high-high containment pressure or steamline break protection logic (as indicated by high steam pressure rate or low steamline pressure). High steam pressure rate is only effective when steamline SI is manually blocked during startup and cooldown, and low steamline pressure is only effective when the block is removed (see Figure 7.2-1 sheet 7). The MSIV's are closed by operation of the MSIV valve actuators. The actuator is, in effect, a hydraulic cylinder coupled directly to a nitrogen-accumulator. The accumulator is designed as a chamber concentric to the hydraulic cylinder, and it stores the energy required for closing the MSIV in the form of compressed nitrogen gas. Because the accumulator is integral part of the cylinder, the loss of any external manifolding or system elements will not prevent the actuator from closing the valve. A hydraulic control system which maintains hydraulic fluid below the valve actuator piston is utilized to regulate valve closure velocity. Extension of the actuator to close the MSIV is accomplished by an electric signal which operates two solenoid valves in the hydraulic control system portion of the actuator. These valves permit the hydraulic fluid below

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Q212.139

the actuator piston to flow into a hydraulic reservoir at a controlled rate as the compressed nitrogen extends the actuator to close the MSIV.

Each component of the hydraulic control system whose presence or function is required to effect the fail-safe extension of the actuator is redundant with a second component capable of performing the required function regardless of the state of operation or failure of the other. Two hydraulic control system manifolds are provided, each of which is capable of providing valve closure capability independently of the other. The MSIV fails closed on a loss of hydraulic fluid. 20 Q212.139

The same signal that trips closed the MSIV closes the bypass valves by deenergizing redundant solenoids on the bypass valve operator hydraulic system.

The initiation and control of main steam isolation is redundant and electrically and physically separated. There is no single failure in the initiation and control portions of the system that will prevent a "main steam isolation" signal from arriving at its destination. 6 Q032.43

A main steam isolation signal will close the MSIVs, and the bypass valves.

A main steam isolation signal will also isolate the flow from the drain pots upstream of the MSIVs associated with each steam line. These valves have two train inputs so that valves can be closed even if one train fails and also fail closed on either loss at electric signal or air failure. (See Section 10.3.2.7). 14 Q032.43

Q032.74

Following a main steam isolation signal, the main turbine will trip on either redundant reactor trip or turbine trip signals, and the closed turbine stop valves will serve as a backup to the MSIVs. Thus, in the event of a failure of a MSIV to close, main steam will still be isolated. There will be an insignificant loss of steam through the

a test solenoid in the hydraulic circuit as well as energizing the trip-close solenoid. An automatic MSIV trip-close signal overrides the test signal and closes the valve quickly.

There is no provision for testing the bypass valves.

Alarms are actuated when MSIVs have low hydraulic oil pressure or low actuator gas pressure. Each valve has position-indication lights on the main control board for open, closed, and test positions. There are monitor lights which light on valve-closed position.

The automatically operated MSIVs serve only a safety function and are not required for power operation. They are required to limit uncontrolled flow of steam from the steam generators in the event of a break in the piping system. These valves operate under the following situations:

1. Break in the Steam Line from One Steam Generator Inside the Containment Building

   If the break is within the Containment, steam is discharged into the Containment. The other steam generators act to feed steam through the interconnecting header into the broken line and then into the Containment. A steam line break results in a significant pressure rise in the Containment so that reverse flow protection is necessary to prevent discharge of more than one steam generator. According to calculations, reverse flow must be interrupted within 10 sec to limit the Containment pressure rise to an amount below design pressure. To achieve this, the automatic isolating valves close within five sec from receipt of the initiating signal. Closure of these valves allows for a single failure of an active component.

2. Break in the Steam Line Outside Containment Building and Upstream from the Isolation Valve

In this case, Containment Building pressurization is not a concern. However, the uncontrolled blowdown of more than one steam generator must be prevented. The 10.5-sec valve closure time established previously satisfies the requirements for this situation.

3. Break in the Steam Line or Header Downstream of the Isolation Valve

The 10-sec closure time established previously meets the requirements for this situation.

4. Steam Generator Tube Rupture

In this case, a fast-acting valve closure is not required. The isolation valves limit primary coolant leakage during shutdown by isolating the damaged steam generator after the primary system pressure is reduced below the steam generator shell-side design pressure.

10.3.2.3.2 MSIV Design Requirements

1. Analysis of Accident Conditions

The MSIVs are designed to withstand the conditions created by a large steam line break on either side of them. The valves are designed to withstand the effects of high mass flow rate, moisture carryover, and high fluid velocity. These valves have a controlled speed of closure. The surge pressure caused by the dynamic effect of valve closure does not affect the pressure boundary, in accordance with the calculation of ASME B&PV Code,

d. Closing Rate Test

The complete valve assembly is tested to ensure that the closing time is less than five sec.

3. Leakage

The valve disc and seat materials are such that valve wear does not increase the leakage rate after a minimum of 500 cycles under normal operating conditions.

4. Design Bases

Table 10.3-4 shows the design bases of the MSIVs.

10.3.2.4 Main Steam Isolation Bypass Valves

The MSIVs are provided with 4-in. bypass valves which are normally closed. If the bypass valves were open they would tend to negate the protection provided by the MSIVs. Therefore, the valves close within five sec of receipt of the closure signal. Table 10.3-5 shows the design bases for the main steam isolation bypass valves. are locked closed during power operation.

10.3.2.5 Flow Restrictors

Each steam generator is provided with flow restrictors which are located inside the steam generator outlet nozzle. These restrictors (several venturis arranged in a bundle) limit the steam flow rate in the event of a steam line rupture. These restrictors also minimize the thrust force effects on the steam generator and piping system.

The design basis, description, and test and inspections are included in Section 5.4.4. 13

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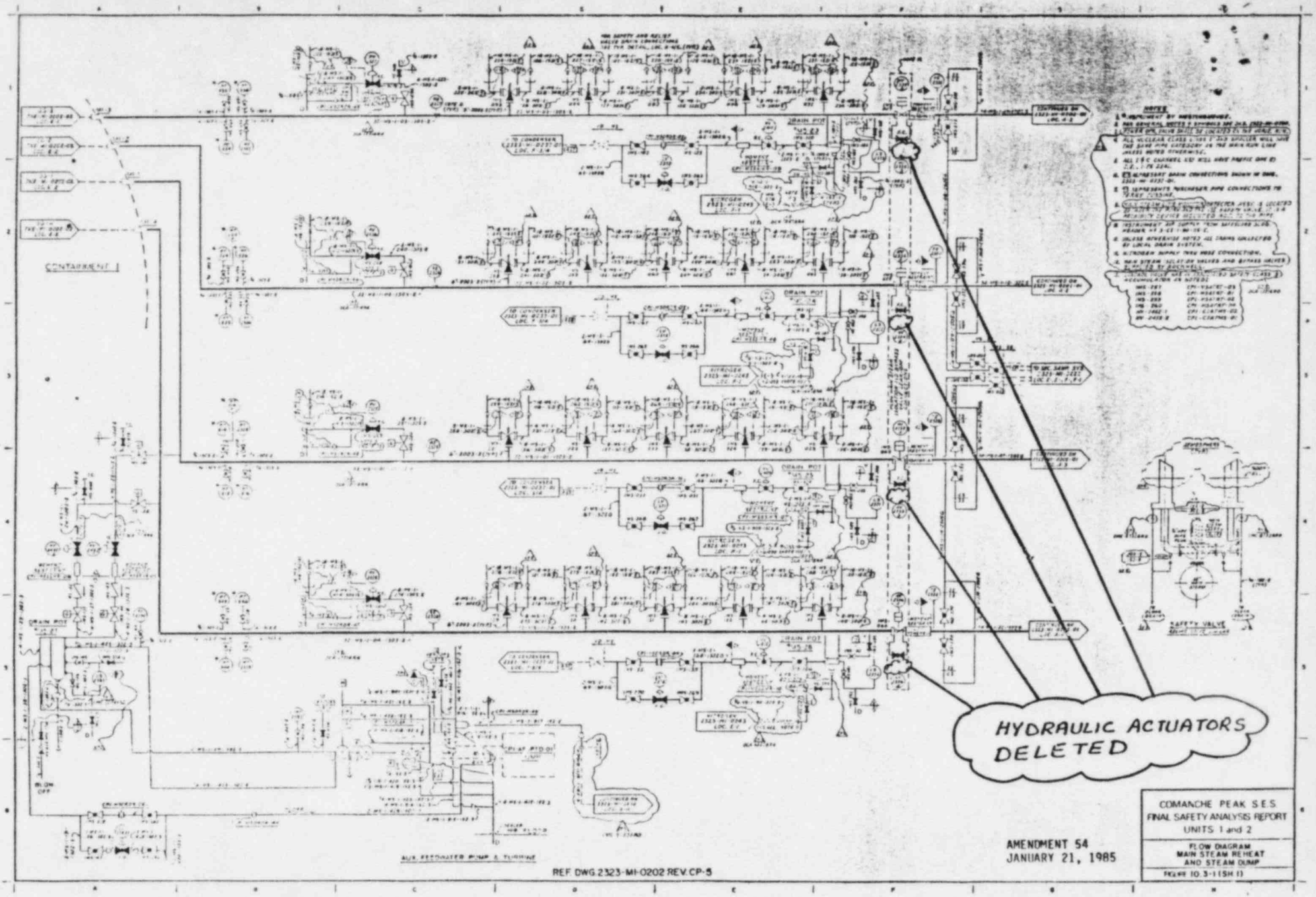
TABLE 10.3-5

MAIN STEAM ISOLATION BYPASS VALVES

Quantity per unit	4
Safety class	ASME B&PV Code, Section III, Class 1, seismic Category I
Design pressure, psia	1200
Design temperature, F	600
Steam flow rate, lb/hr	60,000
Normal operating pressure range, psia	250 to 970
Normal operating temperature range, F	401 to 541
Pressure drop	Critical
Actuator	Hydraulic or Manual (handwheel)
Valve size, in.	4



COMANCHE PEAK S.E.S.
FINAL SAFETY ANALYSIS REPORT
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FLOW DIAGRAM
MAIN STEAM REHEAT
AND STEAM DUMP

FIGURE 10.3-1 (SH 1)

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Table 14.2-2 (Sheet 50 of 60)

MAIN STEAM AND FEEDWATER ISOLATION VALVES
TEST SUMMARY

OBJECTIVE

To demonstrate the operability of the main steam and feedwater isolation valves including their capability to close automatically as required.

PREREQUISITES

1. Plant conditions are established as necessary for test performance.

2. Equipment is available to measure the closure time of the isolation valves.

TEST METHOD

1. Demonstrate local and remote operation of the main steam isolation valves and bypass valves and the feedwater isolation valves. delete

2. Verify that the isolation valves and bypass valves will close upon receipt of an isolation signal. delete

3. Measure the closure time of the isolation valves and bypass delete valves delete to ensure they close within the maximum and minimum time required. | 6 Q423.12 section 23

4. Verify that the isolation valves delete and bypass valves will close upon receipt of an isolation signal for a minimum of 30 minutes while isolated from the Instrument Air System. | 6 Q423.12 section 18

ACCEPTANCE CRITERIA

delete

The main steam and feedwater isolation valves and bypass valves respond properly to remote and local operation and close upon receipt of an isolation signal. Valve closure times meet Technical Specification requirements. | 6 Q423.11

Short Term (Required for Mitigation of Accident)	Hot Standby	Required for Cooldown
Circuits and/or equipment required to trip the main feedwater pumps.		
Main feedwater isolation valves (trip closed feature).		
Main steam line stop valves (trip closed feature).		
Main steam line stop valve bypass valves (trip closed feature). delete		
Steam generator blowdown isolation valves (automatic closure feature).		