



GULF STATES UTILITIES COMPANY

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January 31, 1985
RBG- 20,035
File No. G9.5, G9.8.6.2

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

River Bend Station-Unit I
Docket No. 50-458

Enclosed is the Gulf States Utilities Company (GSU) response to Safety Evaluation Report (SER) Confirmatory Item #20 - Penetration Valve Leakage Control System (PVLCS) Leakage (SER Section 6.2.6.3, page 6-36). A review of the Staff's acceptance criteria for exclusion of leakage from the Main Steam Isolation Valves (MSIVs) (i.e. past the Main Steam-Positive Leakage Control System, MS-PLCS,) indicates that the SER should be revised. Leakage from MSIVs will not be accounted for in the summation of the local leak rate tests because leakage is accounted for separately in the radiological analysis of the site; rather, valves served by the MS-PLCS will not be Type C tested, or included in the 0.60La Type B and C test totals, because pressurized steam trapped between the isolation valves does not leak-out or decay to below the drywell/containment pressure within the first 20 minutes after an accident (i.e. prior to MS-PLCS initiation). In addition, the seismically designed valves have Class 1E power supplies, exist three deep (i.e. there are three valves per line although only two are credited as isolation valves), and have allowable leakage limits as specified in River Bend Station (RBS) proposed Technical Specification 3/4.6.1.2. This position has been deemed acceptable per NUREG-0800, the Standard Review Plan (SRP) Section 15.6.5, Appendix D.

SER Confirmatory Item #20 requested justification of the exclusion of leakage from valves served by the PVLCS in the local leak rate tests. Leakage from valves served by the PVLCS need not be included in the computation of 0.60La since they are limited to an allowable leakage by RBS proposed Technical Specification 3/4.6.1.2 and are included in the offsite radiological dose assessment for the first 25 minutes after an accident (i.e. prior to the PVLCS initiation and pressurization).

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Mr. Denton

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The attached Final Safety Analysis Report (FSAR) pages and tables have been revised to justify the exclusion of PVLCS leakage from the summation of the local leak rate tests and will be included in the next amendment.

Sincerely,

Eddie R Grant

for J. E. Booker
Manager-Engineering,
Nuclear Fuels & Licensing
River Bend Nuclear Group

erg
JEB/WJR/JWL/je

Attachment

The test pressure for all Type C tested containment isolation valves is 7.60 psig.

The main steam isolation valve leakage will be excluded from the summation for the local leak tests since it is supplied with the positive pressure MSPLCS seal system. Valves serviced by the penetration valve leakage control system (PVLCS) will be included in the computation of 0.60 L_a .

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The test fluid used to conduct Type C tests will be selected at the time the Type C test is performed. The test fluid selected will be in accordance with 10CFR50, Appendix J.

3

The total acceptable leakage from Type B and C tests is required to be less than 0.60 L_a .

6.2.6.4 Scheduling and Reporting of Periodic Tests

The periodic leakage rate tests are conducted at the intervals described in the technical specifications.

Type B and C tests may be conducted at any time during normal plant operations or during shutdown periods as long as the time interval between any individual Type B or C test does not exceed the maximum allowable interval specified in the technical specifications. Each time a Type B or C test is completed, the overall total leakage rate for all required Type B and C tests is updated to reflect the most recent test results. Type A, B, and C test results are submitted to the NRC in a summary report approximately 3 months after each test.

6.2.6.5 Special Testing Requirements

6.2.6.5.1 Drywell Bypass Leakage Test

Immediately following the drywell structural integrity test described in Section 3.8.3.7, a preoperational drywell bypass leakage test is performed at drywell design pressure. Preoperational and periodic drywell leakage tests at a reduced pressure, defined in the technical specifications, are performed in addition to the preoperational and periodic Type A tests previously described. These drywell leakage tests verify that, over the design life of the plant, no paths for gross leakage from the drywell to the containment air space bypassing the pressure suppression feature exist. The combination of the design pressure and reduced pressure leakage tests also verifies that the drywell can perform adequately for the full range of postulated coolant system

Insert for Page 6.2-93

Penetrations served by the PVLCS are required to meet a leakage rate limit specified in Technical Specification 3/4.6.1.2. This leakage limit is included in the offsite radiological dose assessment as leakage in addition to 0.60La.

RE
TABLE 6

CONT. PEN. NUMBER	GENERAL DESIGN CRITERIA OR REGULATORY GUIDE	SYSTEM NAME	FLUID	LINE SIZE (INCH)	ESF SYSTEM	ESSEN./NON-ESS. CLASS (22)	THROUGH LINE LEAKAGE CLASSIFICATION	FSAR ARR'G. 'T. FIGURE	ISOLATION VALVE NUMBER	VA INS OUT C
1KJB*Z2	55	TURBINE PLANT MISCELLANEOUS DRAINS (14)	CNDS	3	YES	N	MS-PLCS	6.2-63	1B21*MOV F016	INS
			CNDS	3	YES	N	MS-PLCS	6.2-63	1B21*MOV F018	OUT
1KJB*Z3A	55	FEEDWATER LINE (14)	FDW	20	NO	N	PVLCS	6.2-63	1FWS*MOV 7A	OUT
			FDW	20	NO	N	PVLCS	6.2-63	1B21*AOV F032A	OUT
			FDW	20	NO	N	PVLCS	6.2-63	1B21*V F010A	INS
1KJB*Z3B	55	RESIDUAL HEAT REMOVAL RETURN TO FEEDWATER	WATER	10	YES	N	SGTS	6.2-63	1E12*MOV F053A	OUT
		FEEDWATER LINE (14)	FDW	20	NO	N	PVLCS	6.2-63	1FWS*MOV 7B	OUT
		TI APERTURE CARD	FDW	20	NO	N	PVLCS	6.2-63	1B21*AOV F032B	OUT
			FDW	20	NO	N	PVLCS	6.2-63	1B21*V F010B	INS
RESIDUAL HEAT REMOVAL RETURN TO FEEDWATER	WATER	10	YES	N	SGTS	6.2-63	1E12*MOV F053B	OUT		
1KJB*Z4	56	REACTOR WATER CLEAN UP DISCHARGE TO MAIN CONDENSER (14)	WATER	4	NO	N	PVLCS	6.2-65	1G33*MOV F028	INS
			WATER	4	NO	N	PVLCS	6.2-65	1G33*MOV F034	OUT

AMENDMENT 15

Also Available On Aperture Card

SS FSAR
2-40 (CONT)

LOC. OF VALVE / SIDE / CONT	TYPE TEST	TYPE C TEST MEDIUM	LENGTH OF PIPE FROM CONT. TO OUTERMOST ISOLATION VALVE	VALVE										
				TYPE	OPERATOR	ACTUATION MODE		POSITION				ISOLATION SIGNAL	CLOSURE TIME (SEC)	POWER SOURCE
						PRIMARY	SECONDARY	NORMAL	SHUTDOWN	POST-ACCIDENT	POWER FAILURE			
SIDE	A.C	A-N	N/A	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	A,D,E,F,G, H,I,J,RM	15	B
SIDE	C	A-N	52'-0"	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	A,D,E,F,G, H,I,J,RM	15	A
SIDE	OP N/A	A-NP N/A	64'-2"	GATE	MOV	ELECT.	MANUAL	OPEN	CLOSED	CLOSED	F.A.I.	RM	72	B
SIDE	OP N/A	A-NP N/A	N/A	AO CHECK	PROCESS	PROCESS	N/A	OPEN	CLOSED	CLOSED	F.C.	N/A	N/A	N/A
SIDE	OP A.C	A-NP N/A	N/A	CHECK	PROCESS	PROCESS	N/A	OPEN	CLOSED	CLOSED	N/A	N/A	N/A	N/A
SIDE	C	A-N	76'-2 5/8"	GLOBE	MOV	ELECT.	MANUAL	CLOSED	OPEN/ CLOSED (11)	CLOSED	F.A.I.	C,L,R,S, RM	39	A
SIDE	OP N/A	A-NP N/A	66'-8"	GATE	MOV	ELECT.	MANUAL	OPEN	CLOSED	CLOSED	F.A.I.	RM	72	B
SIDE	OP N/A	A-NP N/A	N/A	AO CHECK	PROCESS	PROCESS	N/A	OPEN	CLOSED	CLOSED	F.C.	N/A	N/A	N/A
SIDE	OP A.C	A-NP N/A	N/A	CHECK	PROCESS	PROCESS	N/A	OPEN	CLOSED	CLOSED	N/A	N/A	N/A	N/A
SIDE	C	A-N	73'-8"	GLOBE	MOV	ELECT.	MANUAL	CLOSED	OPEN/ CLOSED (11)	CLOSED	F.A.I.	C,L,R,S, RM	39	B
SIDE	OP A.C	A-NP N/A	N/A	GATE	MOV	ELECT.	MANUAL	CLOSED	CLOSED	CLOSED	F.A.I.	B,H,I,O, P,Q,RM	15	B
SIDE	OP N/A	A-NP N/A	11'-5 3/4"	GATE	MOV	ELECT.	MANUAL	CLOSED	CLOSED	CLOSED	F.A.I.	B,H,I,N,O, P,Q,RM	15	A

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RE
TABLE 6

CONT. PEN. NUMBER	GENERAL DESIGN CRITERIA OR REGULATORY GUIDE	SYSTEM NAME	FLUID	LINE SIZE (INCH)	ESF SYSTEM	ESSEN./NON-ESS. CLASS. (22)	THROUGH LINE LEAKAGE CLASSIFICATION	FSAR ARR'G 'T. FIGURE	ISOLATION VALVE NUMBER	INS OUT CO
1KJB*Z5	56	REACTOR WATER CLEAN UP BACKWASH DISCHARGE (14)	WATER	2 1/2	NO	N	PV LCS	6.2-65	1WCS*MOV178	INS
			WATER	2 1/2	NO	N	PV LCS	6.2-65	1WCS*MOV172	OUT
1KJB*Z6	55	REACTOR WATER CLEAN UP RETURN TO FEEDWATER	WATER	6	NO	N	SGTS	6.2-63	1G33*MOV F040	INS
			WATER	6	NO	N	SGTS	6.2-63	1G33*MOV F039	OUT
1KJB*Z7	55	REACTOR WATER CLEAN UP PUMP SUCTION	WATER	6	NO	N	SGTS	6.2-63	1G33*MOV F001	INS
			WATER	6	NO	N	SGTS	6.2-63	1G33*MOV F004	OUT
1KJB*Z8	56	HIGH PRESSURE CORE SPRAY PUMP SUCTION FROM SUPPRESSION POOL (16)	WATER (S.P.)	20	YES	E	SGTS	6.2-64	1E22*MOV F015	OUT
1KJB*Z9	55	HIGH PRESSURE CORE SPRAY TO REACTOR	WATER	10	YES	E	SGTS	6.2-63	1E22*MOV F004	OUT
	55	HIGH PRESSURE CORE SPRAY TO REACTOR	WATER	10	YES	E	SGTS	6.2-63	1E22*MOV F005	INS

AMENDMENT 15

Also Available On
Aperture Card

S FSAR
2-40 (CONT)

C. F. VE DE/SIDE INT	TYPE TEST	TYPE C TEST MEDIUM	LENGTH OF PIPE FROM CONT. TO OUTERMOST ISOLATION VALVE	VALVE										CLOSURE TIME (SEC)	POWER SOURCE
				TYPE	OPERATOR	ACTUATION MODE		POSITION				ISOLATION SIGNAL			
						PRIMARY	SECONDARY	NORMAL	SHUTDOWN	POST-ACCIDENT	POWER FAILURE				
SIDE	A. A-N	N/A	N/A	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B.K.RM	11.5	B	
SIDE	N/A	N/A	11'-4 3/4"	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B.K.RM	11.5	A	
SIDE	A.C	A-N	N/A	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B.H.I.O. P.Q.RM	15	B	
SIDE	C	A-N	12'-7 1/4"	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B.H.I.N.O. P.Q.RM	15	A	
SIDE	A.C	A-N	N/A	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B.H.I.M.O. P.Q.RM	20	B	
SIDE	C	A-N	13'-6 5/16"	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B.H.I.M.N.O. P.Q.RM	6.5	A	
TSIDE	C	W	12'-10 1/2"	GATE	MOV	ELECT.	MANUAL	CLOSED	CLOSED	OPEN	F.A.I.	RM	20	C	
TSIDE	C	A-N	15'-2 3/8"	GATE	MOV	ELECT.	MANUAL	CLOSED	CLOSED	OPEN	F.A.I.	RM	17	C	
SIDE	A.C	A-N	N/A	AO CHECK (2)	PROCESS	PROCESS	N/A	CLOSED	CLOSED	OPEN	N/A	N/A	N/A	C	

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TABLE 6

CONT. PEN. NUMBER	GENERAL DESIGN CRITERIA OR REGULATORY GUIDE	SYSTEM NAME	FLUID	LINE SIZE (INCH)	ESF SYSTEM	ESSEN./NON-ESS CLASS. (22)	THROUGH LINE LEAKAGE CLASSIFICATION	FSAR ARRGT. FIGURE	ISOLATION VALVE NUMBER	
1KJB+Z41	56	FIRE PROTECTION HEADER (14)	WATER	6	NO	N	PV LCS	6.2-65	1FPW*MOV121	
			WATER	6	NO	N	PV LCS	6.2-65	1FPW*V263	
1KJB+Z42	---	SPARE	---	---	---	---	---	---	---	
1KJB+Z43	---	SPARE	---	---	---	---	---	---	---	
1KJB+Z44	56	SERVICE AIR SUPPLY TO CONTAINMENT AND DRYWELL (14)	AIR	4	NO	N	PV LCS	6.2-65	1SAS*MOV102	
			AIR	4	NO	N	PV LCS	6.2-65	1SAS*V486	
1KJB+Z46	56	INSTRUMENT AIR SUPPLY TO CONTAINMENT AND DRYWELL (14)	AIR	3	NO	N	PV LCS	6.2-65	1IAS*MOV106	
			AIR	3	NO	N	PV LCS	6.2-65	1IAS*V60	
1KJB+Z48	56	REACTOR PLANT COMPONENT COOLING WATER SUPPLY	WATER	10	NO	N	SGTS	6.2-65	1CCP*MOV138	
			WATER	10	NO	N	SGTS	6.2-65	1CCP*V118	
1KJB+Z49	56	REACTOR PLANT COMPONENT COOLING WATER RETURN	WATER	10	NO	N	SGTS	6.2-65	1CCP*MOV158	
			WATER	10	NO	N	SGTS	6.2-65	1CCP*MOV159	

Amendment 11
 Also Available On
 Aperture Card

BS FSAR
2-40 (CONT)

TI APERTURE CARD

LOC. OF VALVE (SIDE/INSIDE/OUT)	TYPE TEST	TYPE C TEST MEDIUM	LENGTH OF PIPE FROM CONT. TO OUTERMOST ISOLATION VALVE	VALVE										ISOLATION SIGNAL	CLOSURE TIME (SEC)	POWER SOURCE
				TYPE	OPERATOR	ACTUATION MODE		POSITION								
						PRIMARY	SECONDARY	NORMAL	SHUTDOWN	POST-ACCIDENT	POWER FAILURE					
INSIDE	N/A 	N/A 	10'-11 1/2"	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B.K.RM	31	A		
INSIDE	A.C. 	N/A 	N/A	CHECK	PROCESS	PROCESS	N/A	OPEN	OPEN	CLOSED	N/A	N/A	N/A	N/A		
INSIDE	N/A 	N/A 	11'-3 1/16"	GATE	MOV	ELECT.	MANUAL	OPEN	CLOSED	CLOSED	F.A.I.	B.K.RM	20	A		
INSIDE	A.C. 	N/A 	N/A	CHECK	PROCESS	PROCESS	N/A	OPEN	CLOSED	CLOSED	N/A	N/A	N/A	N/A		
OUTSIDE	N/A 	N/A 	11'-11 1/16"	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B.K.RM	17	A		
INSIDE	A.C. 	N/A 	N/A	CHECK	PROCESS	PROCESS	N/A	OPEN	OPEN	CLOSED	N/A	N/A	N/A	N/A		
OUTSIDE	C	A-N	9'-0"	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B. K.RM	21.5	A		
INSIDE	A.C	A-N	N/A	CHECK	PROCESS	PROCESS	N/A	OPEN	OPEN	CLOSED	N/A	N/A	N/A	N/A		
INSIDE	A.C	A-N	N/A	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B. K.RM	21.5	B		
OUTSIDE	C	A-N	10'-4"	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B. K.RM	21.5	A		

TABLE 6

CONT. PEN. NUMBER	GENERAL DESIGN CRITERIA OR REGULATORY GUIDE	SYSTEM NAME	FLUID	LINE SIZE (INCH)	ESF SYSTEM	ESSEN./NON-ESS CLASS. (22)	THROUGH LINE LEAKAGE CLASSIFICATION	FSAR ARR'G 'T. FIGURE	ISOLATION VALVE NUMBER	V IN OUC
1KJB *Z131	56	VENTILATION CHILLED WATER RETURN (14)	WATER	8	NO	N	PV LCS.	6.2-65	I HVN *MOV102	I
			WATER	8	NO	N	PV LCS.	6.2-65	I HVN *MOV128	O
1KJB *Z132	56	VENTILATION CHILLED WATER SUPPLY (14)	WATER	8	NO	N	PV LCS.	6.2-65	I HVN *MOV127	O
			WATER	8	NO	N	PV LCS.	6.2-65	I HVN *V541	I
1KJB *Z134	56	CONDENSATE MAKEUP SUPPLY (14)	WATER	4	NO	N	PV LCS.	6.2-65	I CNS *MOV125	O
			WATER	4	NO	N	PV LCS.	6.2-65	I CNS *V86	I
1KJB *Z601A	_____	SPARE	_____	_____	_____	_____	_____	_____	_____	_____
1KJB Z601B	56	REACTOR PLANT SAMPLING	WATER	0.5	NO	N	SG TS	6.2-65	I SSR *SOV130	O
			WATER	0.5	NO	N	SG TS	6.2-65	I SSR *SOV131	O
1KJB *Z601C	_____	SPARE	_____	_____	_____	_____	_____	_____	_____	_____
1KJB Z601D	_____	SPARE	_____	_____	_____	_____	_____	_____	_____	_____

AMENDMENT 15

Also Available On Aperture Card

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2-40 (CONT)

TI APERTURE CARD

VALVE SIDE/ UNIT	TYPE TEST	TYPE C TEST MEDIUM	LENGTH OF PIPE FROM CONT. TO OUTERMOST ISOLATION VALVE	VALVE										CLOSURE TIME (SEC)	POWER SOURCE
				TYPE	OPERATOR	ACTUATION MODE		POSITION				ISOLATION SIGNAL			
						PRIMARY	SECONDARY	NORMAL	SHUTDOWN	POST- ACCIDENT	POWER FAILURE				
IDE	A.	N/A 	N/A	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B.K.RM	29	B	
IDE	N/A 	N/A 	10'-8 3/4"	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B.K.RM	27.5	A	
SIDE	N/A 	N/A 	11'-0 3/4"	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B.K.RM	27.5	A	
IDE	A.	N/A 	N/A	CHECK	PROCESS	PROCESS	N/A	OPEN	OPEN	CLOSED	N/A	N/A	N/A	N/A	
SIDE	N/A 	N/A 	10'-8"	GATE	MOV	ELECT.	MANUAL	OPEN	OPEN	CLOSED	F.A.I.	B.K.RM	21	A	
SIDE	A.	N/A 	N/A	CHECK	PROCESS	PROCESS	N/A	CLOSED	CLOSED	CLOSED	N/A	N/A	N/A	N/A	
SIDE	A.C	A-N	N/A	GLOBE	SOV	ELECT	MANUAL	CLOSED	CLOSED	CLOSED	CLOSED	A.K.RM	3	B	
TSIDE	A.C	A-N	LTR	GLOBE	SOV	ELECT	MANUAL	CLOSED	CLOSED	CLOSED	CLOSED	A.K.RM	3	A	

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1. MAIN STEAM ISOLATION VALVES REQUIRE THAT BOTH SOLENOID PILOTS BE DE-ENERGIZED TO CLOSE VALVES. ACCUMULATOR AIR DE-ENERGIZED. VOLTAGE FAILURE AT ONLY ONE PILOT DOES NOT CAUSE CLOSURE.
2. TESTABLE CHECK VALVES ARE DESIGNED FOR REMOTE OPENING WITH ZERO DIFFERENTIAL PRESSURE ACROSS THE VALVE SEAT. SWITCHES MAY BE POSITIONED FOR OPEN. THE VALVES OPEN WHEN PUMP PRESSURE EXCEEDS REACTOR PRESSURE EVEN THOUGH
3. CONTROL ROD DRIVE HYDRAULIC LINES CAN BE ISOLATED BY THE SOLENOID VALVES OUTSIDE THE DRYWELL. LINES THAT EXT TO PREVENT OUTLEAKAGE. SOLENOID VALVES NORMALLY ARE CLOSED, BUT THEY OPEN ON ROD MOVEMENT AND DURING REACTOR
4. A-C MOTOR-OPERATED VALVES ARE POWERED FROM THE DESIGNATED A-C STANDBY BUS. D-C MOTOR OPERATED ISOLATION VA
5. ALL MOTOR-OPERATED ISOLATION VALVES REMAIN IN THE LAST POSITION UPON FAILURE OF VALVE POWER. ALL AIR-OPERATED ISOLATION VALVES, CLOSE ON POWER FAILURE TO THE SOLENOID PILOTS.
6. NORMAL STATUS POSITION OF VALVE (OPEN OR CLOSED) IS THE POSITION DURING NORMAL POWER OPERATION OF THE REACTOR
7. CLOSING TIME IS BASED ON VALVE CLOSURE RATE AND LINE SIZE.
8. DRYWELL AND CONTAINMENT ISOLATION VALVES FOR H₂ ANALYZERS REMAIN OPEN DURING ALL CONDITIONS. OPERATOR ACTION
9. VALVES OPEN ONLY DURING INITIAL STAGES OF RHR SHUTDOWN COOLING (FIRST 12 HOURS) WITH RETURN TO RPV.
10. VALVES OPEN DURING CONTINUATION OF SHUTDOWN COOLING AFTER 20 HOURS WITH RETURN TO UPPER CONTAINMENT POOL.
11. VALVES OPEN ONLY DURING FIRST 24 HOURS OF SHUTDOWN COOLING WITH RETURN TO RPV.
12. ADS AND LOW-LOW SET VALVES AIR SUPPLY ISOLATED ON LOCA ONLY IF AIR LINE HEADER PRESSURE FALLS BELOW DRYWELL
13. DELETED
14. OUTBOARD ISOLATION VALVES ARE SEALED BY EITHER PVLCS OR MSPLCS. LEAKAGE FROM ~~THESE~~ VALVES IS NOT INCLUDED ^{sealed by P}
15. THE INBOARD ISOLATION VALVE IS A BUTTERFLY VALVE, TESTED IN THE REVERSE DIRECTION; LEAKAGE CHARACTERISTIC
16. THE VALVE IS SEALED FROM THE CONTAINMENT ATMOSPHERE BECAUSE ITS LINE TERMINATES BELOW THE MINIMUM WATER LEAKAGE IS NOT INCLUDED IN THE 0.60 Lb TYPE B AND C TEST TOTALS.
17. THE GLOBE VALVE IS TESTED IN THE REVERSE DIRECTION. THIS IS A CONSERVATIVE TEST SINCE IT TENDS TO UNSEAT
18. THESE VALVES ARE REQUIRED TO BE OPEN DURING THE CONDUCTING OF THE TYPE A TEST. THEIR LOCAL LEAKAGE RATES
19. THESE ARE RELIEF VALVES FOR WHICH DOWNSTREAM PIPING TERMINATES AT A POINT BELOW THE SUPPRESSION POOL MINIMUM ASME SECTION III, DIVISION 1, SUBSECTION NC7153 REQUIRES THAT NO OTHER STOP VALVE OR DEVICE MAY BE PLACED OVERPRESSURE PROTECTION. THIS PRECLUDES THE ADDITION OF A MAINTENANCE VALVE TO FACILITATE TYPE C TESTS.
20. THESE ARE INSTRUMENT ISOLATION VALVES THAT ARE REQUIRED TO REMAIN OPEN DURING A LOCA.
21. INBOARD MSIV'S ARE TESTED IN THE REVERSE DIRECTION. THIS IS A CONSERVATIVE TEST SINCE PRESSURE IN THE REVERSE LEAKAGE FROM MSIV'S IS NOT INCLUDED IN THE 0.60 Lb TYPE B AND C TEST TOTALS.
22. SEE SECTION 6.2.4.3.7 FOR A DESCRIPTION OF THE ESSENTIAL / NON-ESSENTIAL CLASSIFICATION.

Insert

Insert

ISOLATION SIGNAL CODES

A. REACTOR VESSEL LOW WATER LEVEL 1	Q. RWCU SYSTEM HIGH
B. REACTOR VESSEL LOW WATER LEVEL 2	P. RWCU SYSTEM EQUI
C. REACTOR VESSEL LOW WATER LEVEL 3	Q. RWCU SYSTEM EQUI
D. HIGH MAIN STEAM LINE FLOW	R. RHR SYSTEM EQUI
E. HIGH MAIN STEAM LINE RADIATION	S. RHR SYSTEM EQUI
F. MAIN STEAM LINE LOW PRESSURE (REACTOR MODE SWITCH RUN ONLY)	T. CONTAINMENT HIGH
G. LOW MAIN CONDENSER VACUUM	U. N/A
H. HIGH MAIN STEAM LINE TUNNEL AMBIENT TEMPERATURE	V. N/A
I. HIGH MAIN STEAM LINE TUNNEL DIFFERENTIAL TEMPERATURE	W. REACTOR PRESSURE
J. HIGH MAIN STEAM LINE AREA TEMPERATURE (TURBINE BUILDING)	X. RCIC ISOLATION
K. HIGH DRYWELL PRESSURE	(a) PIPE ROUTE
L. HIGH REACTOR PRESSURE	(b) EQUIPMENT
M. STANDBY LIQUID CONTROL SYSTEM ACTUATED	(c) TURBINE EX
N. HIGH NON-REGENERATIVE HEAT EXCHANGER OUTLET TEMPERATURE (RWCU SYSTEM)	(d) STEAM LINE
	Y. MSIV AIR LINE
	Z. LOW DIFFERENTIAL
	RL. REMOTE MANUAL

S FSAR
E 6.2-40
NOTES

PRESSURE PLUS SPRING FORCE ACT TOGETHER TO CLOSE VALVES WHEN BOTH PILOTS ARE

THE VALVES CLOSE ON REVERSE FLOW EVEN THOUGH THE TEST
TEST SWITCH MAY BE POSITIONED FOR CLOSE.

AND OUTSIDE THE DRYWELL ARE SMALL AND TERMINATE IN A SYSTEM THAT IS DESIGNED
FOR SCRAM.

THESE ARE POWERED FROM THE DESIGNATED PLANT BATTERY.

THE VALVES CLOSE ON MOTIVE AIR FAILURE. ALL AIR OPERATED VALVES, EXCEPT MAIN STEAM

(SEE POSITION - NORMAL * COLUMN).

IS REQUIRED TO ISOLATE THESE LINES.

DESIGN PRESSURE.

LCS

ON THE 0.60 Lb TYPE B AND C TEST TOTALS.

ARE THE SAME IN BOTH DIRECTIONS.

LEVEL OF THE SUPPRESSION POOL, AND IS TESTED WITH WATER.

THE DISC.

IS ADDED TO THE UPPER CONFIDENCE LIMIT (UCL).

AT WATER LEVEL AND ARE THUS PROVIDED WITH A WATER SEAL.

RELATIVE TO A PRESSURE RELIEF DEVICE WHICH COULD REDUCE

IN ONE DIRECTION TENDS TO UNSEAT THE DISC. *12*

DIFFERENTIAL FLOW

IN THE INSTRUMENT AREA HIGH AMBIENT TEMPERATURE

IN THE INSTRUMENT AREA HIGH DIFFERENTIAL TEMPERATURE

IN THE INSTRUMENT AREA HIGH AMBIENT TEMPERATURE

IN THE INSTRUMENT AREA HIGH DIFFERENTIAL TEMPERATURE

IN THE INSTRUMENT AREA GASEOUS RADIATION

LOW

SIGNALS:

INSTRUMENT AREA HIGH TEMPERATURE

INSTRUMENT AREA HIGH TEMPERATURE

INSTRUMENT AREA MUST DIAPHRAGM HIGH PRESSURE

INSTRUMENT AREA HIGH DIFFERENTIAL PRESSURE OR INSTRUMENT LINE BREAK

INSTRUMENT AREA HEADER HIGH FLOW

INSTRUMENT AREA PRESSURE (MSIV AIR LINE HEADER AND DRYWELL)

OPERATION AS APPROPRIATE

TI
APERTURE
CARD

N/A - Not Applicable

W - WATER

A-N - AIR OR NITROGEN

N - NON-ESSENTIAL

E - ESSENTIAL

SGTS - STANDBY GAS TREATMENT
SYSTEM

FBCFS - FUEL BUILDING CHARCOAL
FILTRATION SYSTEM

PV - RELIEF VALVE

AOV - AIR-OPERATED VALVE

CV - CHECK VALVE

MOV - MOTOR-OPERATED VALVE

MV - MANUAL VALVE

TCV - TESTABLE CHECK VALVE

SOV - SOLENOID OPERATED VALVE

ESF - ENGINEERED SAFETY FEATURE

F.C. - FAIL CLOSED

F.A.I. - FAIL AS IS

F.O. - FAIL OPEN

L.C. - LOCKED CLOSED

L.O. - LOCKED OPEN

HYV - HYDRAULIC-OPERATED VALVE

Insert for Table 6.2-40, Page 18/18

14. Penetrations served by the PVLCS are required to meet a leakage rate limit as specified in Technical Specification 3/4.6.1.2. This leakage is included in the offsite radiological dose assessment as leakage in addition to the 0.60La term.
21. Valves served by the MS-PLCS will not be Type C tested or included in the 0.60La Type B and C test totals.
23. These are normally locked closed valves in non-process lines and will not be Type C tested.

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2. Reactor water cleanup backwash to radwaste
3. Condensate makeup
4. Fire protection
5. Ventilation chilled water return
6. Ventilation chilled water supply
7. Service air
8. Instrument air
9. Feedwater to Reactor Pressure Vessel - Loop A
10. Feedwater to Reactor Pressure Vessel - Loop B

The process lines either contain reactor coolant or provide a possible pathway for fission product leakage. See Table 9.3-3 for PVLCS process line information.

9.3.6.2 System Description

9.3.6.2.1 General Description

14 | The PVLCS is shown on Fig. 6.7-1. The PVLCS process lines have two ~~containment~~ isolation valves located outside the containment and are independently powered from electrical Division I and Division II. The PVLCS is composed of two independent and redundant systems, inboard and outboard, to accomplish the leakage control function. The term inboard refers to the system that pressurizes the valve closest to the containment; outboard refers to the system pressurizing the outermost valve, with the exception of the feedwater system valves. The inboard PVLCS pressurizes the outermost feedwater valve (for both feedwater process lines) due to electrical control consistency. The inboard PVLCS receives power from electrical Division I and the outboard PVLCS receives power from electrical Division II. The elimination of leakage is accomplished by creating pressure barriers at the closed isolation valves outside the containment by injecting air into the space between the seats of the double-disk gate valves. (All the process line containment isolation valves are the double-disk gate type.) The valve cavities and air piping are filled with air from 0 to 40 psig within 5 min of system initiation using two PVLCS air compressors (one for each PVLCS) and their accumulators. The release of fission products is eliminated if either one or both of the inboard

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TABLE 9.3-3

FVLCS PROCESS LINE INFORMATION

<u>Process Line</u>	<u>Line Designation</u>	<u>Line Size (in)</u>	<u>Penetration Number</u>	<u>Inner Valve</u>	<u>Outer Valve</u>	<u>Maximum Leak Rate/ Valve (scfh)</u>	<u>Line Termination</u>
Reactor water cleanup (1)	1-WCS-004-185-2 (Z-)	4	*24	1-G33*MOVFO34 (ZR)	1-WCS*MOV111 (ZB)	2.4	Turbine building
Reactor water cleanup (2)	1-WCS-025-109-2 (Z-)	2.5	*25	1-WCS*MOV172 (ZR)	1-WCS*MOV173 (ZB)	1.5	Radwaste building
Condensate makeup and drawoff	1-CNS-004-18-2 (Z-)	4	*2134	1-CNS*MOV125 (ZR)	1-CNS*MOV130 (ZB)	2.4	Turbine building
Fire protection	1-FPW-006-334-2 (Z-)	6	*241	1-FPW*MOV121- (ZR)	1-FPW*MOV122 (ZB)	3.6	All areas
Ventilation chilled water (1)	1-HVN-008-402-2 (Z-)	8	*2131	1-HVN*MOV128 (ZR)	1-HVN*MOV130 (ZB)	4.8	Turbine building
Ventilation chilled water (2)	1-HVN-008-389-2 (Z-)	8	*2132	1-HVN*MOV127 (ZR)	1-HVN*MOV129 (ZB)	4.8	Turbine building
Service air	1-SAS-004-998-2 (Z-)	4	*244	1-SAS*MOV102 (ZR)	1-SAS*MOV103 (ZB)	2.4	Turbine building
Instrument air	1-IAS-003-55-2 (Z-)	3	*246	1-IAS*MOV106 (ZR)	1-IAS*MOV107 (ZB)	1.8	Turbine building
Feedwater (1)	1-FWS-020-62-2 (A-)	20	*23A	1-FWS*MOV7A (AE)	1-B21*MOVFO65A (AR)	12	Turbine building
Feedwater (2)	1-FWS-020-63-2 (B-)	20	*23B	1-FWS*MOV7B (BE)	1-B21*MOVFO65B (BR)	12	Turbine building

NOTE: The total maximum outleakage for penetrations served by the PVLCS when pressurized to P_a is less than the limit specified in Technical Specification 3/4.6.1.2.