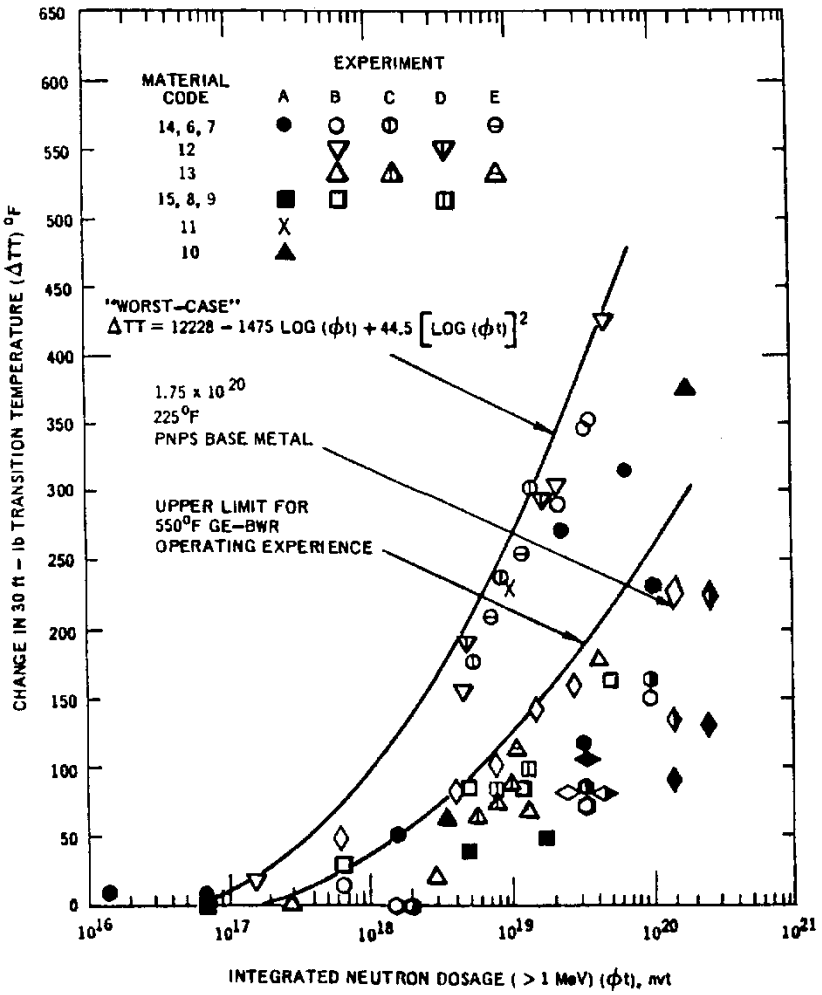
LIST OF FIGURES

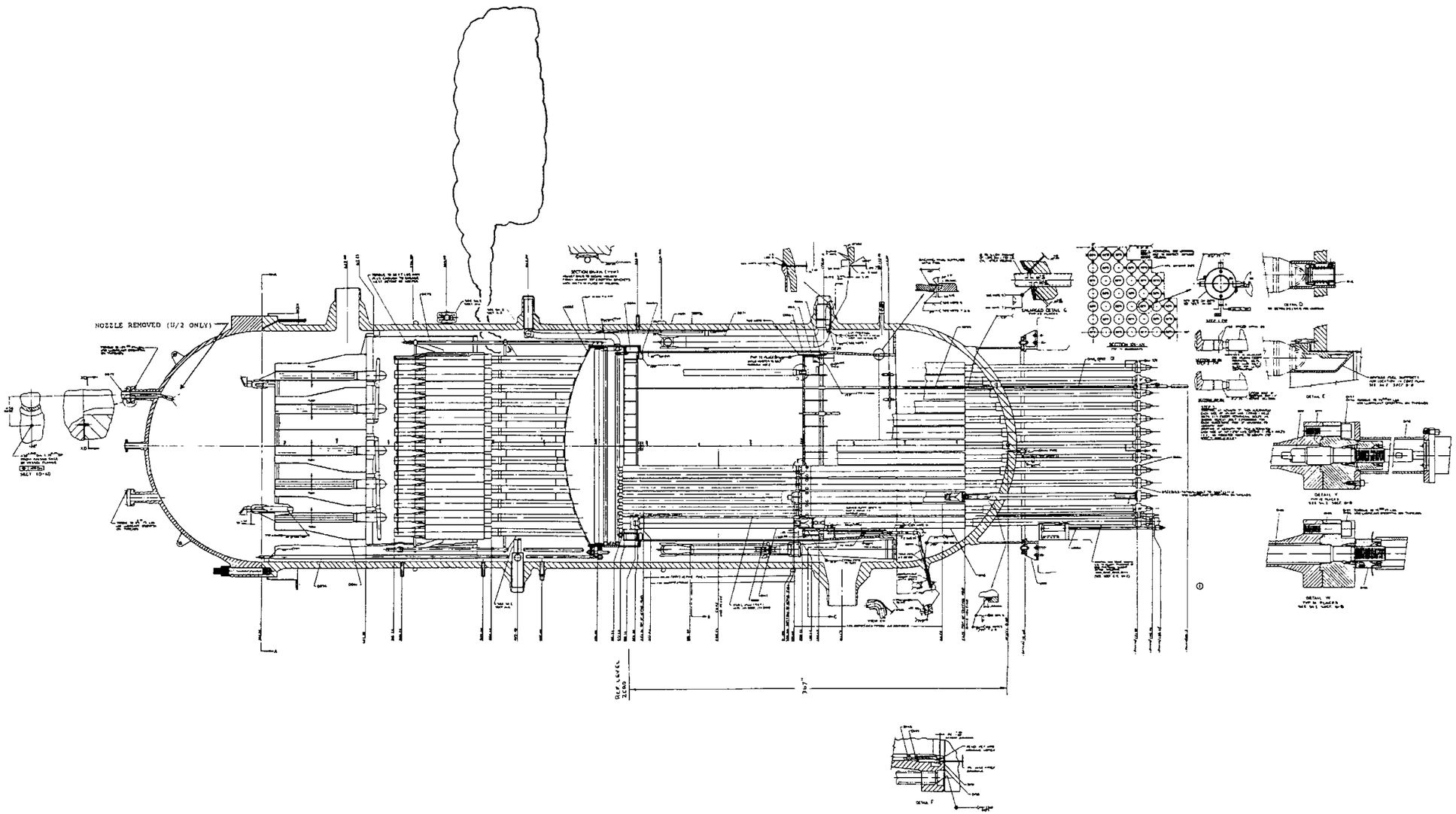
EFFECT OF IRRADIATION ON VARIOUS HEATS OF A302B/A533B — CLASS 1



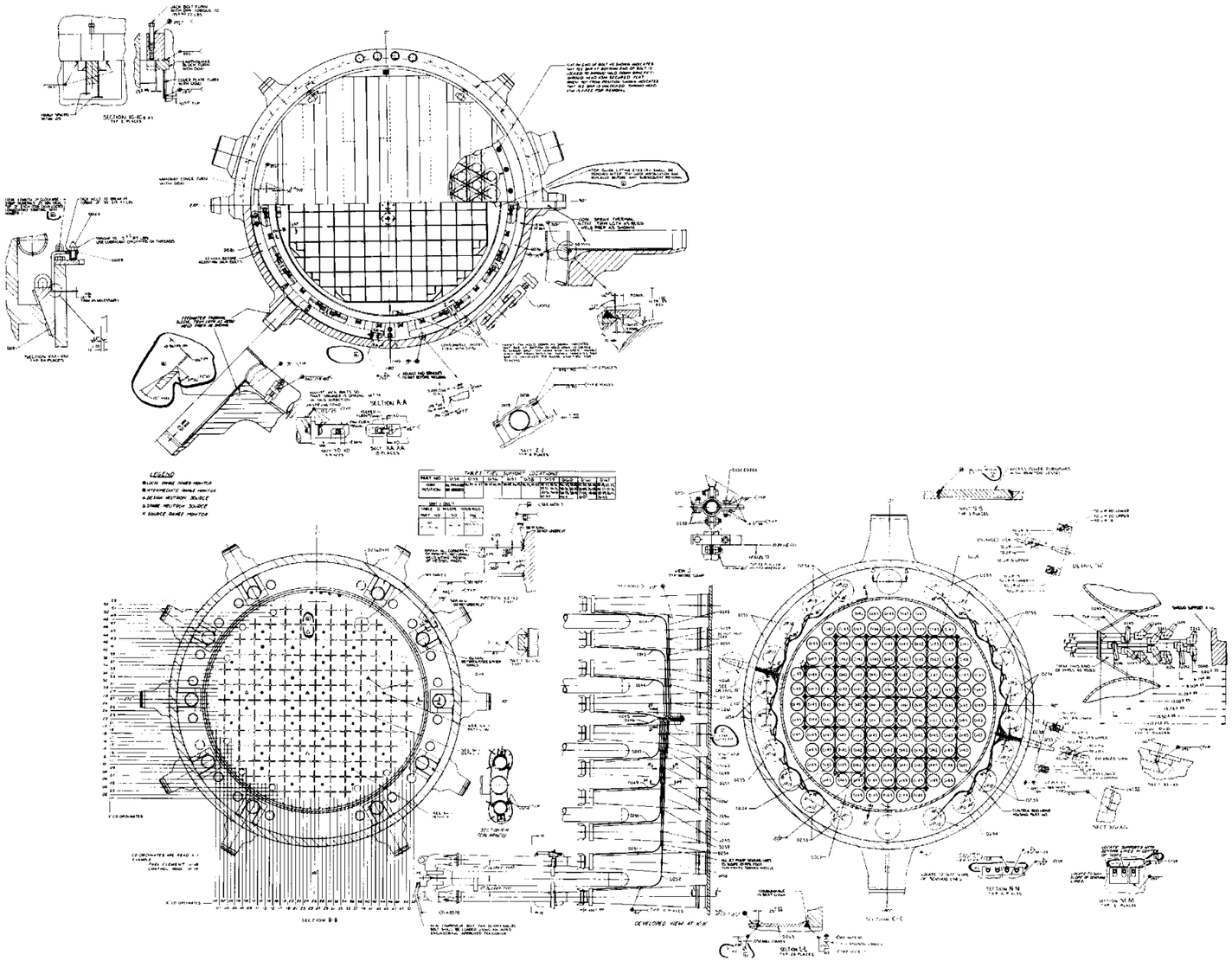
GENERAL ELECTRIC
SURVEILLANCE PROGRAM TEST RESULTS
PLOTTED FOR COMPARISON WITH REFERENCE DATA (2)

- ◇ DNPS – BASE METAL
- ◆ DNPS – WELD METAL
- ◈ DNPS – HAZ
- ○ BIG ROCK – BASE METAL
- ● BIG ROCK – WELD METAL
- ◑ BIG ROCK – HAZ
- ◇ HUMBOLDT – BASE METAL
- ◆ HUMBOLDT – WELD METAL
- ◈ HUMBOLDT – HAZ

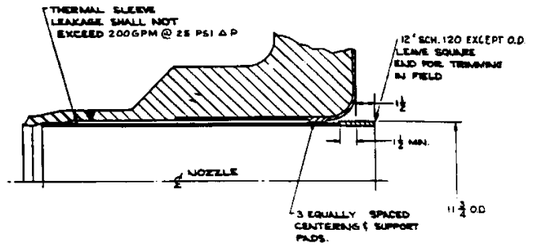
REACTOR VESSEL SCHEMATIC



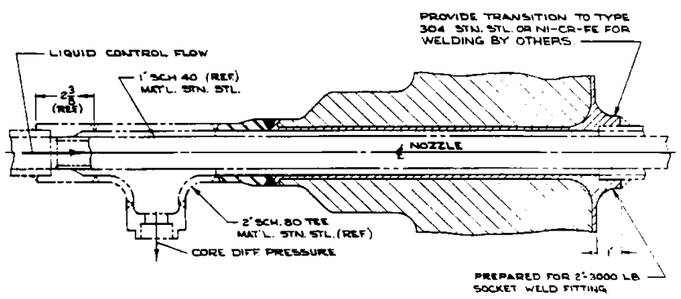
REACTOR ASSEMBLY



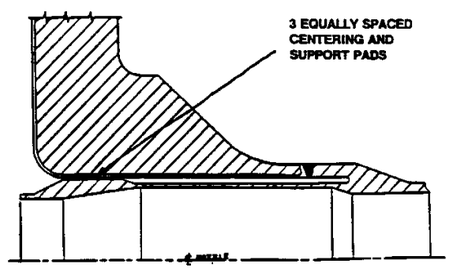
REACTOR VESSEL NOZZLES AND PENETRATIONS



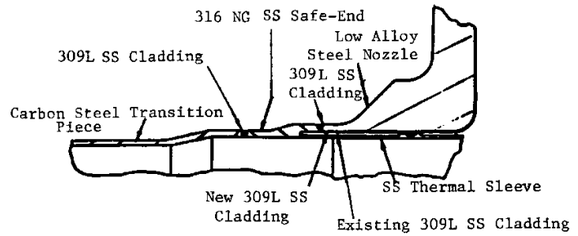
FEEDWATER NOZZLE



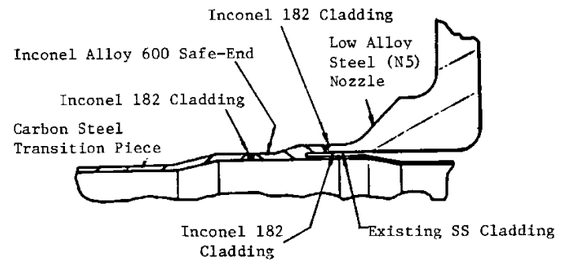
CORE DIFFERENTIAL PRESSURE & LIQUID CONTROL NOZZLE



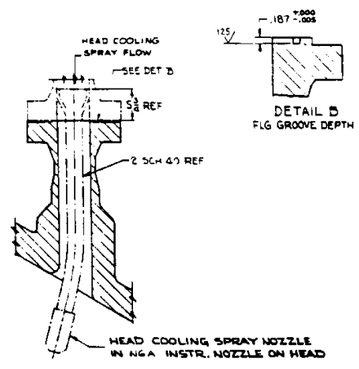
RECIRCULATION INLET NOZZLE



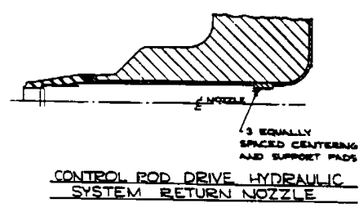
CORE SPRAY NOZZLE - UNIT 1



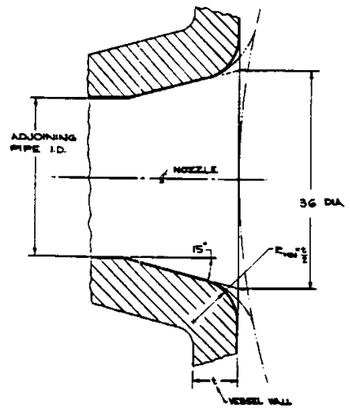
CORE SPRAY NOZZLE - UNIT 2



INSTR. NOZZLE ON HEAD



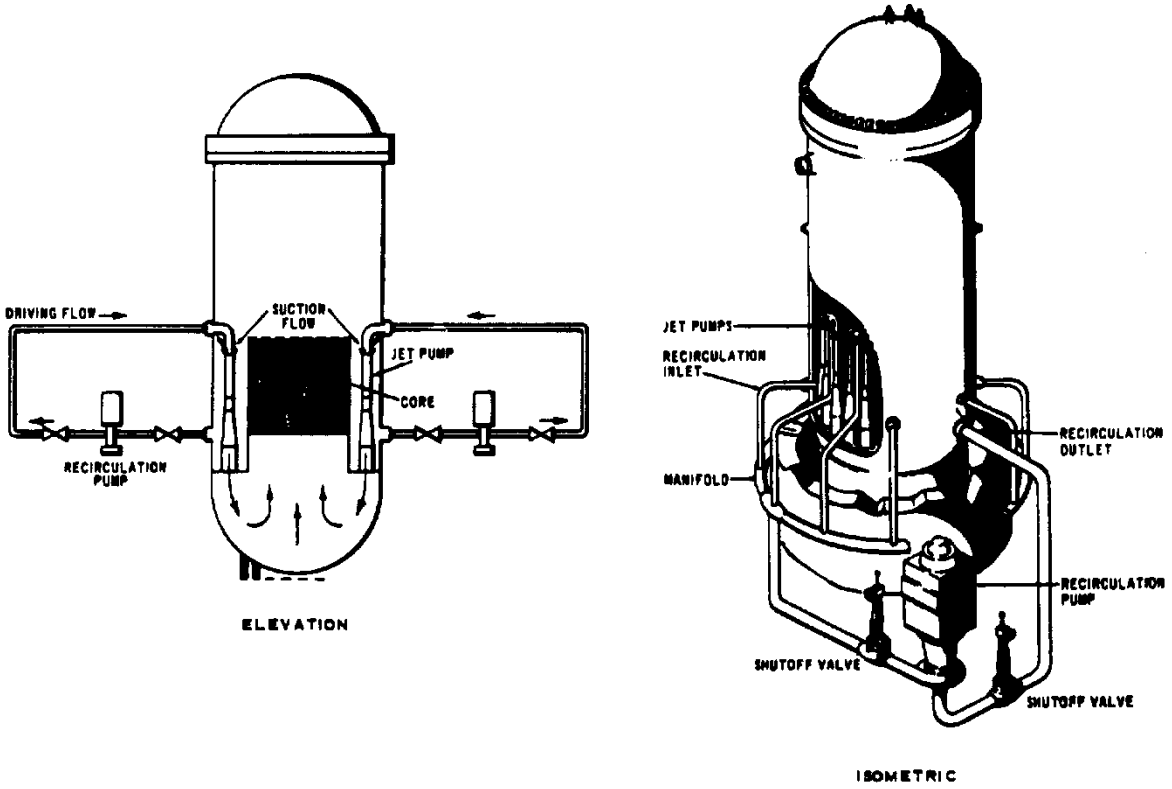
CONTROL ROD DRIVE HYDRAULIC SYSTEM RETURN NOZZLE



RECIRCULATION OUTLET NOZZLE

NOTE: THIS DRAWING PROVIDES FUNCTIONAL REQUIREMENTS & IS NOT INDICATIVE OF DETAIL DESIGN OF NOZZLES OR THERMAL SLEEVES. THE SUPPLIER SHALL PROVIDE DETAIL DESIGN TO CARRY IMPOSED LOADS & ACCOMMODATE THERMAL TRANSIENTS

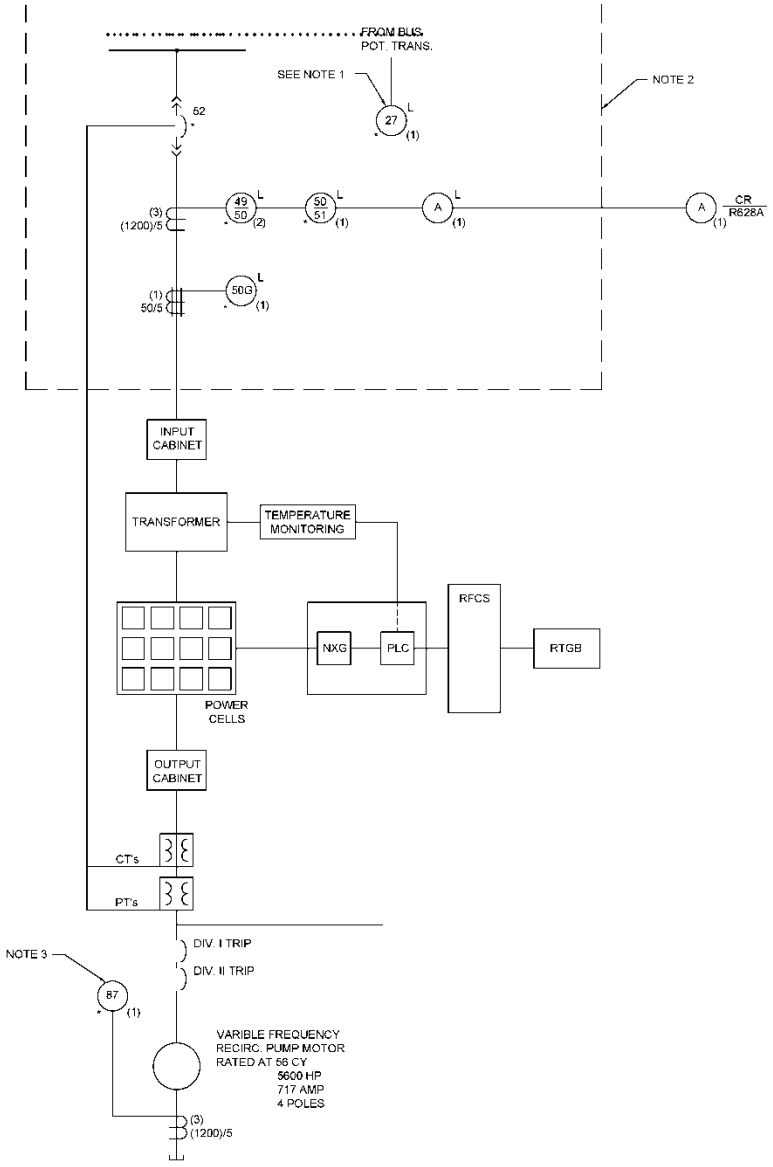
RECIRCULATION SYSTEM — ELEVATION (ISOMETRIC)



SECURITY-RELATED INFORMATION WITHHOLD UNDER 10 CFR 2.390

SECURITY-RELATED INFORMATION WITHHOLD UNDER 10 CFR 2.390

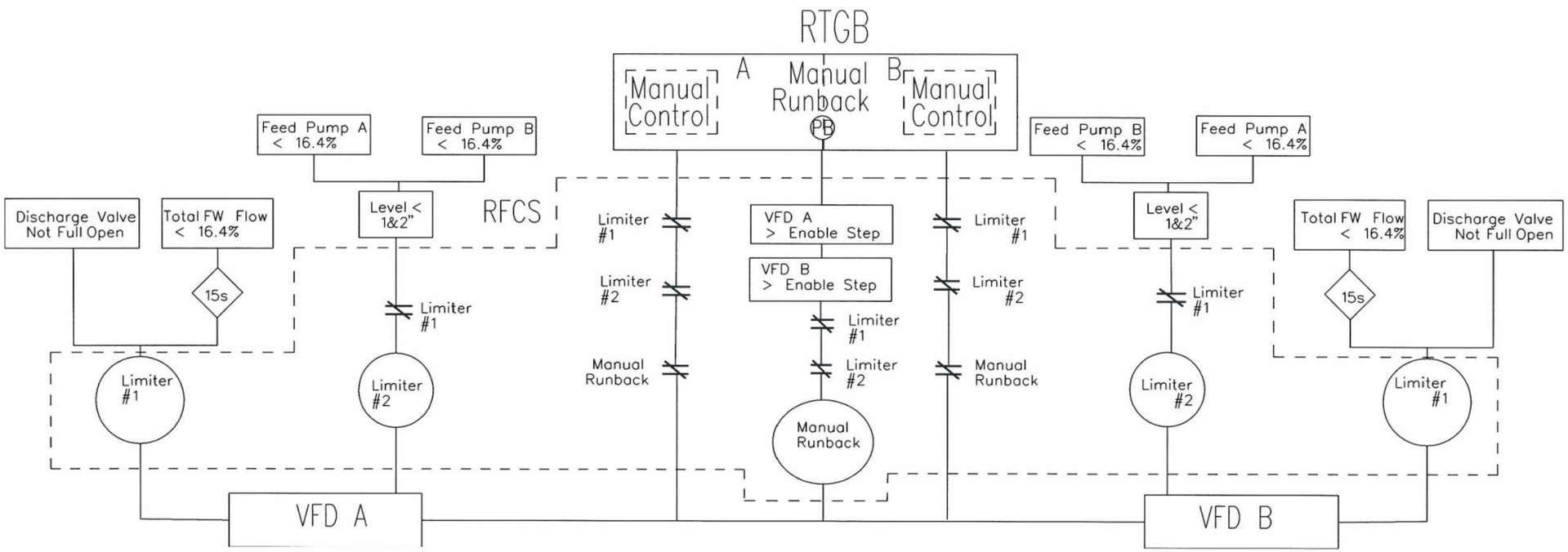
RECIRCULATION PUMP - ONE LINE METER AND RELAY DIAGRAM



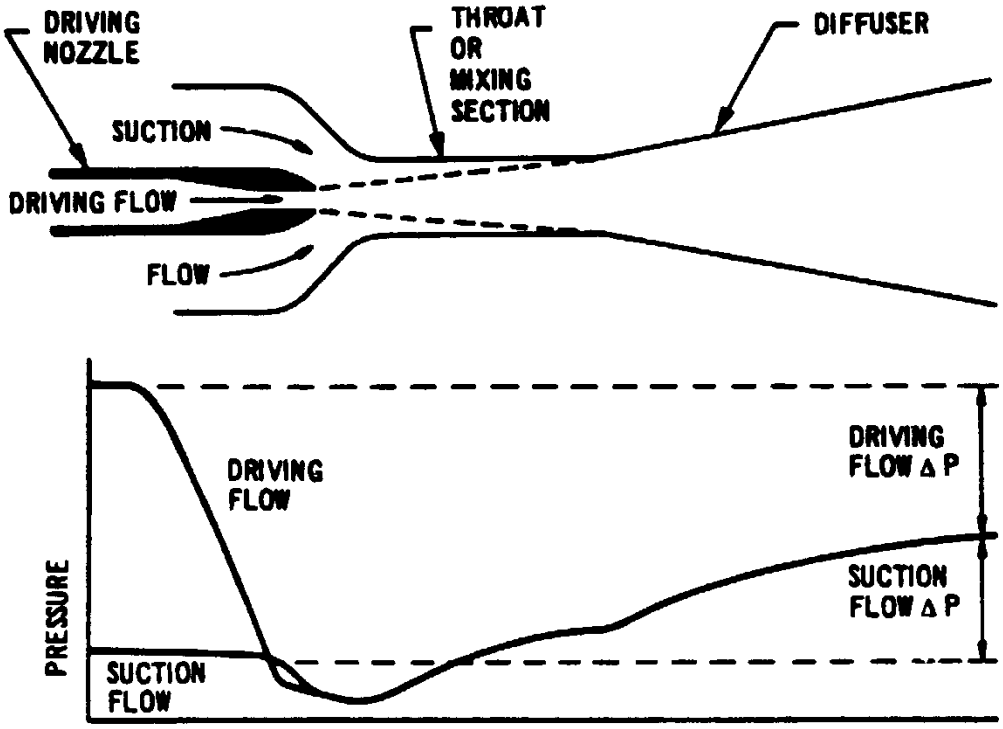
NOTES

1. Reference Document: Reactor Recirculation System FCD D32-1020.
2. Drive motor protective relays and metering shall be furnished by others and mounted on the motor switchgear cubicle.
3. These devices shall be part of and mounted on Panel No. P003 (protection and Auxiliary Relay Cubicle).

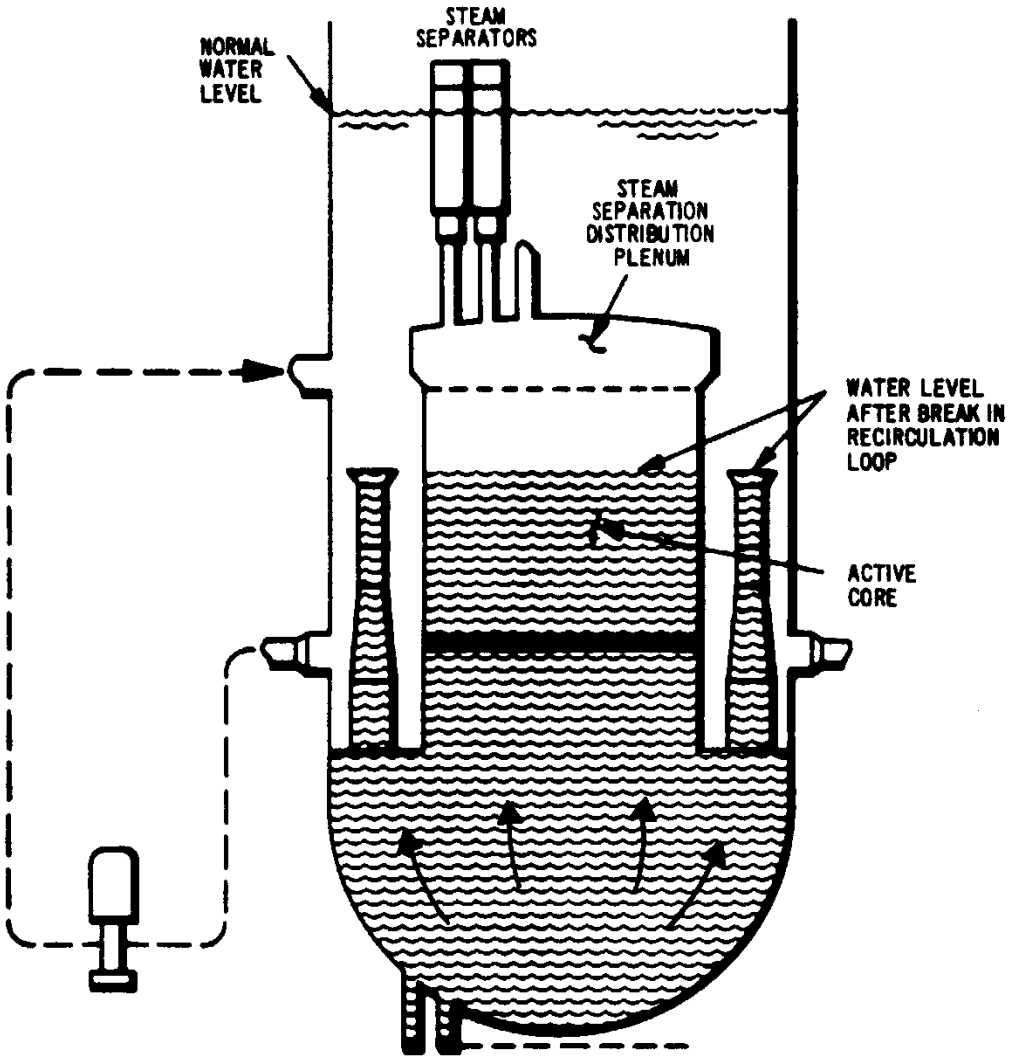
RECIRCULATION PUMP SPEED CONTROL BLOCK DIAGRAM



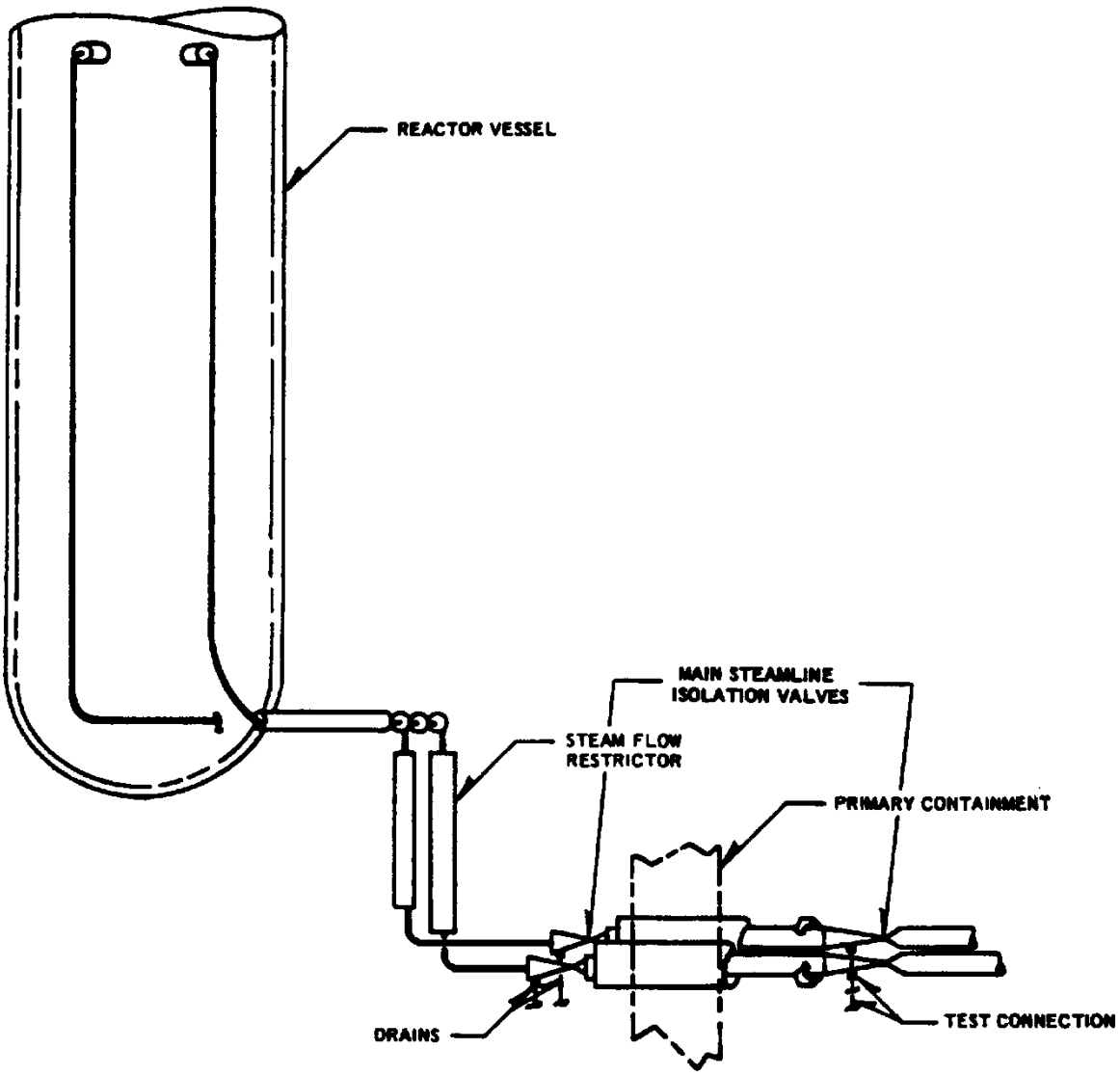
JET PUMP OPERATING PRINCIPLE



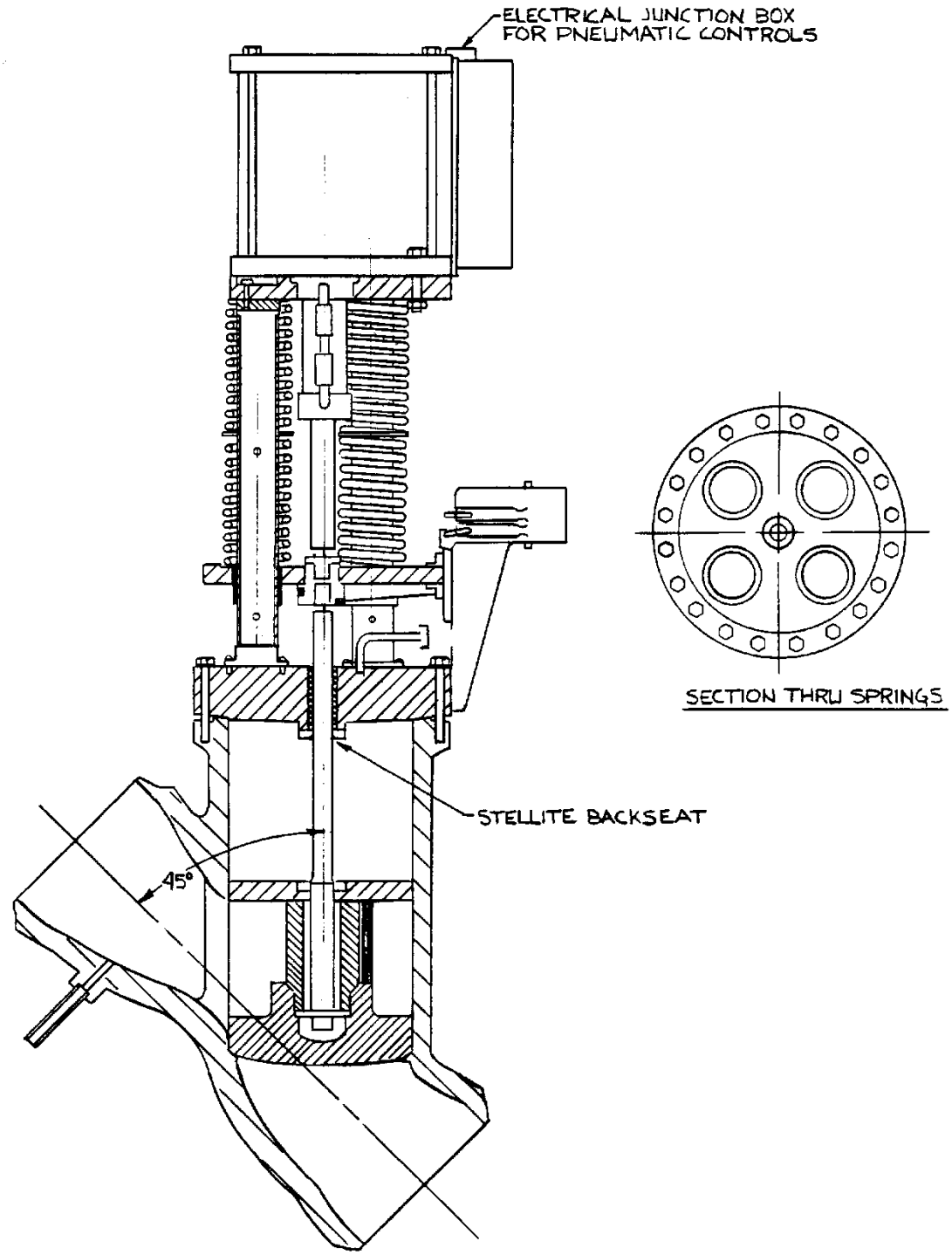
RECIRCULATION SYSTEM CORE FLOODING CAPABILITY



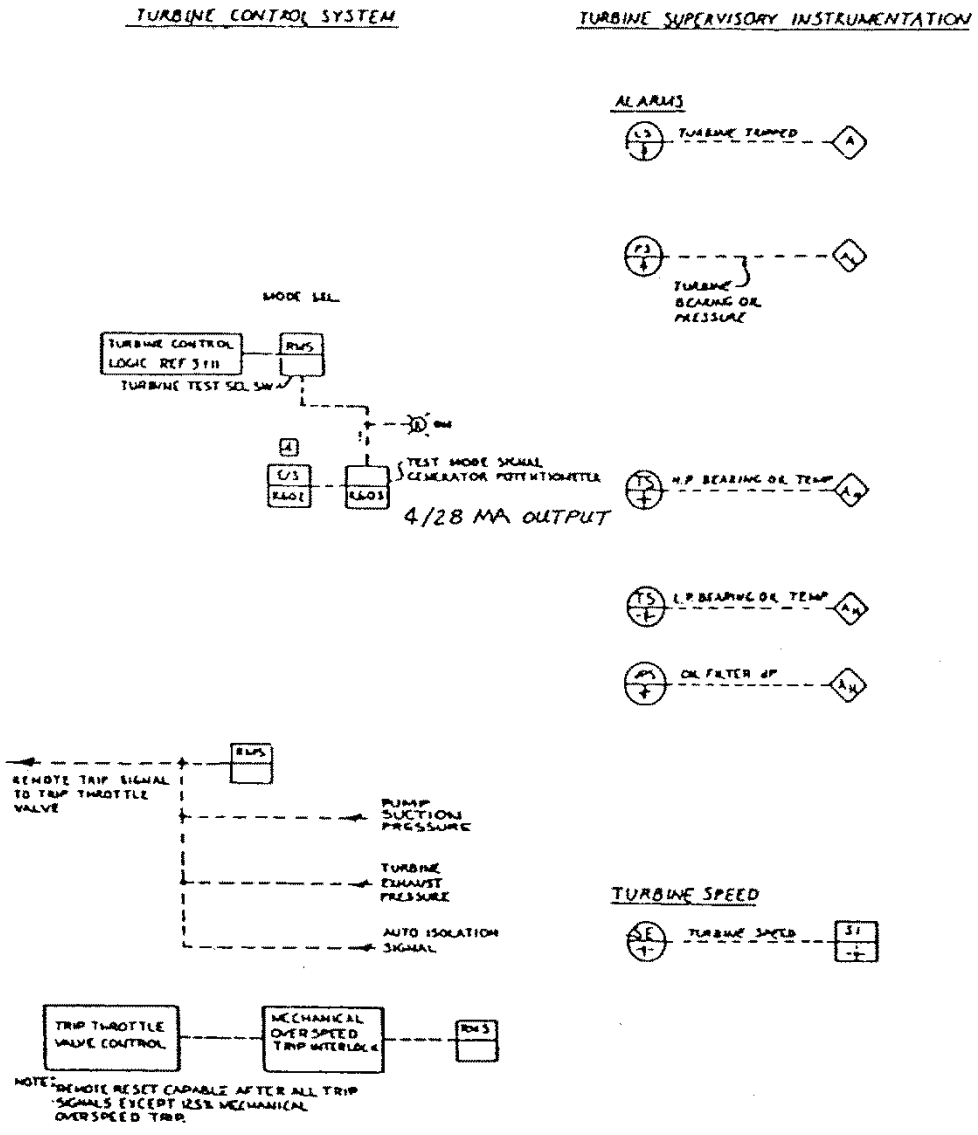
MAIN STEAM LINE FLOW RESTRICTOR LOCATION



MAIN STEAM LINE ISOLATION VALVE



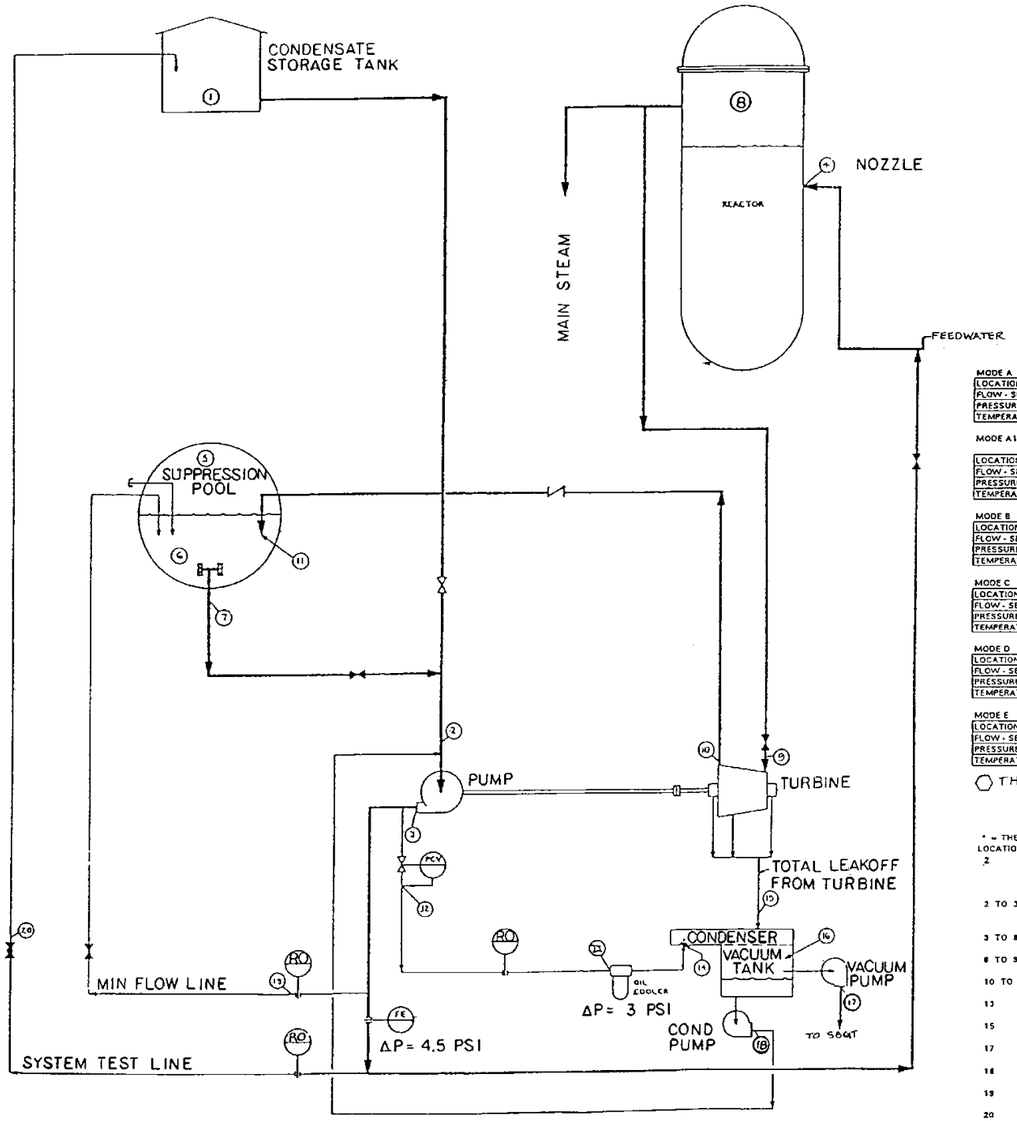
REACTOR CORE ISOLATION COOLING PUMP - TURBINE DETAILS FLOW DIAGRAM



1. For RCIC leak detection arrangement, see Figures 7-19 and 7-20.

Ref. Drawing 9527-D-2529, Rev. 17.

REACTOR CORE ISOLATION COOLING SYSTEM PROCESS DIAGRAM



NOTES:

1. ATMOSPHERIC PRESSURE OF 14.7 WAS USED IN CALCULATIONS.
2. WATER FLOWS IN GPM, STEAM FLOWS IN 1000 LB/HR
3. THE MAXIMUM POOL WATER TEMPERATURE FOR CONTINUOUS SYSTEM OPERATION WILL NOT EXCEED 140°F. HOWEVER, DUE TO POTENTIAL FOR SHORT DURATION OPERATION AT HIGHER TEMPERATURES, PIPING EXPANSION SHALL BE BASED ON 170°F.
4. THE CONTROLLING MODES FOR LINE SIZING AND ARRANGEMENT ARE AS FOLLOWS:

SUCTION FROM COND. STORAGE	MODE A
SUCTION FROM SUPPRESSION POOL	MODE C
PUMP DISCHARGE	MODE C
STEAM SUPPLY	MODE A & B
TURBINE EXHAUST	MODE A, C & D
TEST LINE	MODE E
COOLING SYSTEM	MODE A

5. AS PER EER 80-0187, THE PUMP VENDOR RECOMMENDS MAINTAINING MINIMUM FLOW VALUES OF NO LESS THAN 80 GPM AT 2250 RPM (<2 HRS/DAY), 96 GPM AT 2250 RPM (>2 HRS/DAY), 130 GPM AT 4500 RPM (<2HRS/DAY) AND 200 GPM AT 4500 RPM (> 2HRS/DAY).
6. MODE A1 REPRESENTS THE MAXIMUM EXPECTED STEAM FLOW AT NORMAL OPERATING CONDITIONS. THE MODE A1 VALUES FOR PUMP FLOW AND PUMP DISCHARGE PRESSURE ARE FROM FROM EER 94-0112. OTHER VALUES FOR THIS MODE WERE DETERMINED AS PER ESR 95-0238 REV 5 AI 1.

MODE A — SUCTION FROM CONDENSATE STORAGE, REACTOR AT HIGH PRESSURE, SUPPRESSION POOL AT HIGH PRESSURE

LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FLOW - SEE NOTE 2	–	400	416	400	–	–	0	–	22.19	22.04	22.04	16	16	16	0.16	–	0.01	16	–	0
PRESSURE - PSIA	14.7	*	1265	1188	18	–	–	1143	*	*	19.8	75	*	45.0	*	9.8	*	*	*	–
TEMPERATURE °F	100	100	100	100	140	–	–	565	SAT	SAT	228	100	100	100	230	120	120	120	100	–

MODE A1 — SUCTION FROM CONDENSATE STORAGE, REACTOR AT HIGH PRESSURE, SUPPRESSION POOL AT LOW PRESSURE, CONTROLLER SET FOR 500 GPM

LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FLOW - SEE NOTE 2	–	500	516	500	–	–	0	–	25.07	24.92	24.92	16	16	16	0.16	–	0.01	16	–	0
PRESSURE - PSIA	14.7	35	1273	1188	18	–	–	1183	*	*	19.8	75	*	45.0	*	9.8	*	*	*	–
TEMPERATURE °F	100	100	100	100	–	–	–	569	SAT	SAT	228	100	100	100	230	120	120	120	100	–

MODE B — SUCTION FROM CONDENSATE STORAGE, REACTOR AT LOW PRESSURE, SUPPRESSION POOL AT HIGH PRESSURE

LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FLOW - SEE NOTE 2	–	400	416	400	–	–	0	–	6.34	6.19	6.19	16	16	16	0.15	–	0.01	16	–	0
PRESSURE - PSIA	14.7	*	245	170	18	–	–	165	*	*	18.6	75	*	45.0	*	9.8	*	*	*	–
TEMPERATURE °F	100	100	100	100	100	–	–	360	SAT	SAT	218	100	100	100	230	120	120	120	100	–

MODE C — SUCTION FROM SUPPRESSION POOL, REACTOR AT HIGH PRESSURE, SUPPRESSION POOL AT LOW PRESSURE

LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FLOW - SEE NOTE 2	–	400	416	400	–	–	400	–	22.31	22.16	22.16	16	16	16	0.15	–	0.01	16	–	0
PRESSURE - PSIA	–	*	1263	1188	14.7	17.7	16.5	118	*	*	25.9	75	*	45.0	*	9.8	*	*	*	–
TEMPERATURE °F	–	140	140	140	140	140	140	565	SAT	SAT	218	140	140	140	230	160	160	160	140	–

MODE D — SUCTION FROM SUPPRESSION POOL, REACTOR AT LOW PRESSURE, SUPPRESSION POOL AT LOW PRESSURE

LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FLOW - SEE NOTE 2	–	400	416	400	–	–	400	–	6.37	6.22	6.22	16	16	16	0.15	–	0.01	16	–	0
PRESSURE - PSIA	14.7	*	245	170	14.7	–	–	165	*	*	16.5	75	*	45.0	*	9.8	*	*	*	–
TEMPERATURE °F	–	140	140	140	140	–	–	366	SAT	SAT	218	140	140	140	230	160	160	160	140	–

MODE E — TEST MODE, SUCTION FOR CONDENSATE STORAGE, REACTOR AT HIGH PRESSURE, SUPPRESSION POOL AT LOW PRESSURE

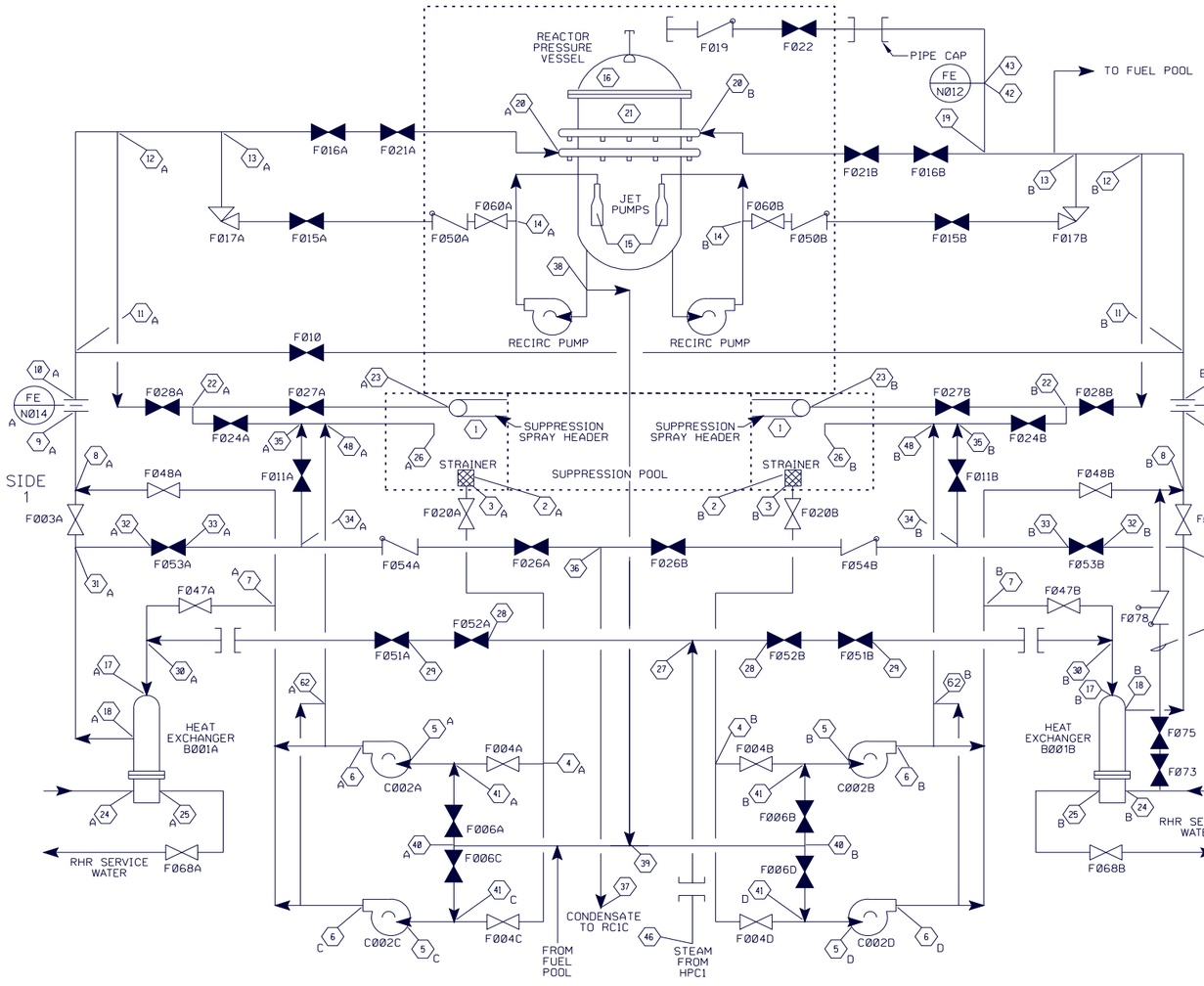
LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FLOW - SEE NOTE 2	–	400	416	400	–	–	0	–	19.23	18.73	18.73	16	16	16	0.15	–	0.01	16	–	400
PRESSURE - PSIA	14.7	*	1140	–	14.7	–	–	1045	*	*	16.5	75	*	45	*	9.8	*	*	*	–
TEMPERATURE °F	100	100	100	100	–	–	–	550	SAT	SAT	218	100	100	100	230	120	120	120	100	–

⬡ THIS SYMBOL DENOTES LOCATION NUMBER.

* = THE PRESSURE AT THIS LOCATION DEPENDS UPON PIPING ARRANGEMENTS, AND MAY BE VARIED WITHIN THE FOLLOWING LIMITS

LOCATION	
2	NPSH REQUIRED IS 18 FT AT 425 GPM, 4500 RPM AS PER VENDOR TEST DATA IN FP-5866 MINIMUM NPSH AVAILABLE IS 26 FT WITH SUPPRESSION POOL SUCTION (AT 170 °F) AS PER CALC 9527-8-E41-06-F MINIMUM NPSH AVAILABLE IS 56 FT WITH CONDENSATE STORAGE SUCTION (AT 100 °F) AS PER CALC M-89-0021
2 TO 3	MAXIMUM DESIGN PRESSURE RISE AVAILABLE: 2911 FT MAX AS PER ESR 95-00238 525 FT AT LOW RX AS PER GE DATA SHEET 22A1354AU
3 TO 8	INJECTION LINE PRESSURE DROP IS 80 PSI AT 400 GM AS PER ESR 96-00333
8 TO 9	MAXIMUM DESIGN PRESSURE DROP = 15 PSI
10 TO 21	NORMAL DROP IS 20 TO 25 PSI AS PER ACTUAL PLANT DATA FROM OPT-10.1.1
13	MAXIMUM PRESSURE ALLOWED = 75 PSIA
15	SUFFICIENT VACUUM TO KEEP STEAM OUT LEAKAGE AT A MINIMUM
17	MAXIMUM PRESSURE AVAILABLE = 25 PSIA
18	MAXIMUM PRESSURE AVAILABLE = 65 PSIA
19	SUFFICIENT PRESSURE TO RETURN TO SUPPRESSION POOL
20	SUFFICIENT PRESSURE TO RETURN TO CONDENSATE STORAGE

RESIDUAL HEAT REMOVAL SYSTEM (LPCI) PROCESS DIAGRAM



FOR OPERATING PARAMETERS REFER TO FIGURE 5-18.

RESIDUAL HEAT REMOVAL SYSTEM (LPCI) PROCESS DIAGRAM

MODE B — RX PRESSURE 20 PSIG

POSITION-○	1	2 A	3 A	4 A	5 A&C	6 A&C	7 A	8 A	9 A	10 A	11 A	12 A	13 A	14 A	15 A
FLOW-GPM	—	19,600	19,600	19,600	9,800	9,800	19,600	◄							19,600
PRESS-PSIA	14.7														
TEMP °F	—	130/75	◄												130/75
MAX. PRESS DROP-FEET					TDH=300										

MODE C-1 (SEE NOTE 18)

POSITION-○	1	2 B	3 B	4 B	5 B&D	6 B&D	7 B	17 B	18 B	8 B	9 B	10 B	11 B	12 B	13 B	19 B	20 B	21	22 B	23 B	1		24 B	25 B
FLOW-GPM	—	11,550	11,550	11,550	5,775	5,775	11,550	◄						11,550	10,950	10,950	10,950	—	600	600	—		8,000	8,000
PRESS-PSIA	14.7																	14.7			14.7			
TEMP °F	—	165	◄					165	154.8	◄							154.8	—	154.8	154.8	—		95	109.8
MAX. PRESS DROP-FEET					TDH=440																			

DUTY PER HX 59.2 x 10^6 BTU/HR (1 HX OPERATING)

MODE C-2 (SEE NOTES 14 & 18)

POSITION-○	1	2 B	3 B	4 B	5 B	6 B	7 B	17 B	18 B	8 B	9 B	10 B	11 B	12 B	13 B	19	20 B	21	22 B	23 B	1		24 B	25 B
FLOW-GPM	—	7,700	◄											7,700	7,300	7,300	7,300	—	400	400	—		8,000	8,000
PRESS-PSIA	19.9																							
TEMP °F	—	197	◄					197	176	◄							176	—	176	176	—		95	115
MAX. PRESS DROP-FEET					TDH=395																			

DUTY PER HX 81.0 x 10^6 BTU/HR (1 HX OPERATING)

MODE E (SEE NOTES 2 & 12) — RX PRESSURE 35 PSIG (SEE NOTE 8)

POSITION-○	16	38	39	40 A&B	41 A&B	5 A&B	6 A&B	7 A&B	17 A&B	18 A&B	8 A&B	11 A&B	12 A&B	13 A&B	14 A&B	15 A&B						24 A&B	25 A&B
FLOW-GPM	—	15,400	15,400	7,700	◄				7,700	<7,700	<7,700	7,700	7,700	7,700	7,700	7,700						8,000	8,000
PRESS-PSIA	50																						
TEMP °F	—	281	◄						281	241.8	◄											85	122.7
MAX. PRESS DROP-FEET						TDH=395																	

DUTY PER HX 151 x 10^6 BTU/HR (2 HX OPERATING)

MODE F — RX PRESSURE Ø PSIG

POSITION-○	16	38	39	40 A&B	41 A&B	5 A&B	6 A&B	7 A&B	17 A&B	18 A&B	8 A&B	9 A&B	10 A&B	11 A	11 B	12 B	13 B	14 B	15 B			24 A&B	25 A&B
FLOW-GPM	—	15,440	15,440	7,700	◄								◄	7,700	15,440	◄			15,440			8,000	8,000
PRESS-PSIA	14.7																						
TEMP °F	—	125	◄						125	117	◄								117			85	92.7
MAX. PRESS DROP-FEET						TDH=395			ΔP=233													ΔP=233	

DUTY PER HX 30.8 x 10^6 BTU/HR (2 HX OPERATING)

MODE G (SEE NOTE 15) — RX PRESSURE Ø PSIG

POSITION-○	1	2 B	3 B	4 B	5 B&D	6 B&D	7 B	8 B	9 B	10 B	11 B	12 B	13 B	14 B	15 B	16							
FLOW-GPM	—	20,800	20,800	20,800	10,400	10,400	20,800	◄							20,800	—							
PRESS-PSIA	14.7															14.7							
TEMP °F	—	130	◄												130	—							
MAX. PRESS DROP-FEET					TDH=272																		

MODE H

POSITION-○	1	2 B	3 B	4 B	5 B&D	6 B&D	7 B	8 B	9 B	10 B	11 B	12 B	22 B	35 B	26 B	1							
FLOW-GPM	—	15,400	15,400	15,400	7,700	7,700	15,400	◄							15,400	—							
PRESS-PSIA	14.7															14.7							
TEMP °F	—	AMB	◄												AMB	—							
MAX. PRESS DROP-FEET						TDH=395																	

RX PRESSURE 135 PSIG — MODE J

POSITION-○	16	38	39	40 A	41 A	5 A	6 A	48 A	9 A	1		1	2 A	3 A	4 A	5 A&C	6 A&C	62 A	48 A	26 A	1		
FLOW-GPM	—	400	◄						400	—		—	800	800	800	400	400	800	800	800	—		
PRESS-PSIA	150									14.7		14.7									14.7		
TEMP °F	—	358	◄						358	—		—	125	◄						125	—		
MAX. PRESS DROP-FEET						SOH=575/690										SOH=575/690							

TABLE 1 — VALVE POSITION CHART — SEE NOTE 7

MODES	F004	F006	F052	F057	F047	F048	F003	F017	F015	F056	F016	F021	F023	F027	F024	F022	F019	F053	F011	F054	F026	F073	F075	F078	F068	STRAINER A	STRAINER B
B	O			O	O	O	O	O																		P	—
C1	O			O		O				O	O	O	O												T	—	P
C2	O			O		O				T	O	O	T												T	—	P
E		O		O	O	T/C	O	O	O																T	—	—
F		O		O		T	O	O	O																T	—	—
G	O			O	O	O	O	O	O																	—	P
H	O				O								O	T												CLEAR	CLEAR
J																										CLEAR	—

O-VALVE OPEN
T-VALVE THROTTLED
P-STRAINER PLUGGED (SEE NOTE 13)
T-C-VALVE THROTTLED TO CLOSED
O-T-VALVE OPENED TO THROTTLED
BLANK SPACE INDICATES VALVE IS CLOSED

TABLE 2
LIMITING LINE LOSSES

MODES	POSITION-○
B	NONE
C1	13-20-21 & 22-23-1
C2	1-2-5
F	16-38-41
G	1-2-5
H	12-22-35-26-1
J	6-48

LEGEND:
RX PRESS - REACTOR VESSEL PRESSURE
SOM - SHUTOFF HEAD (PUMPS)

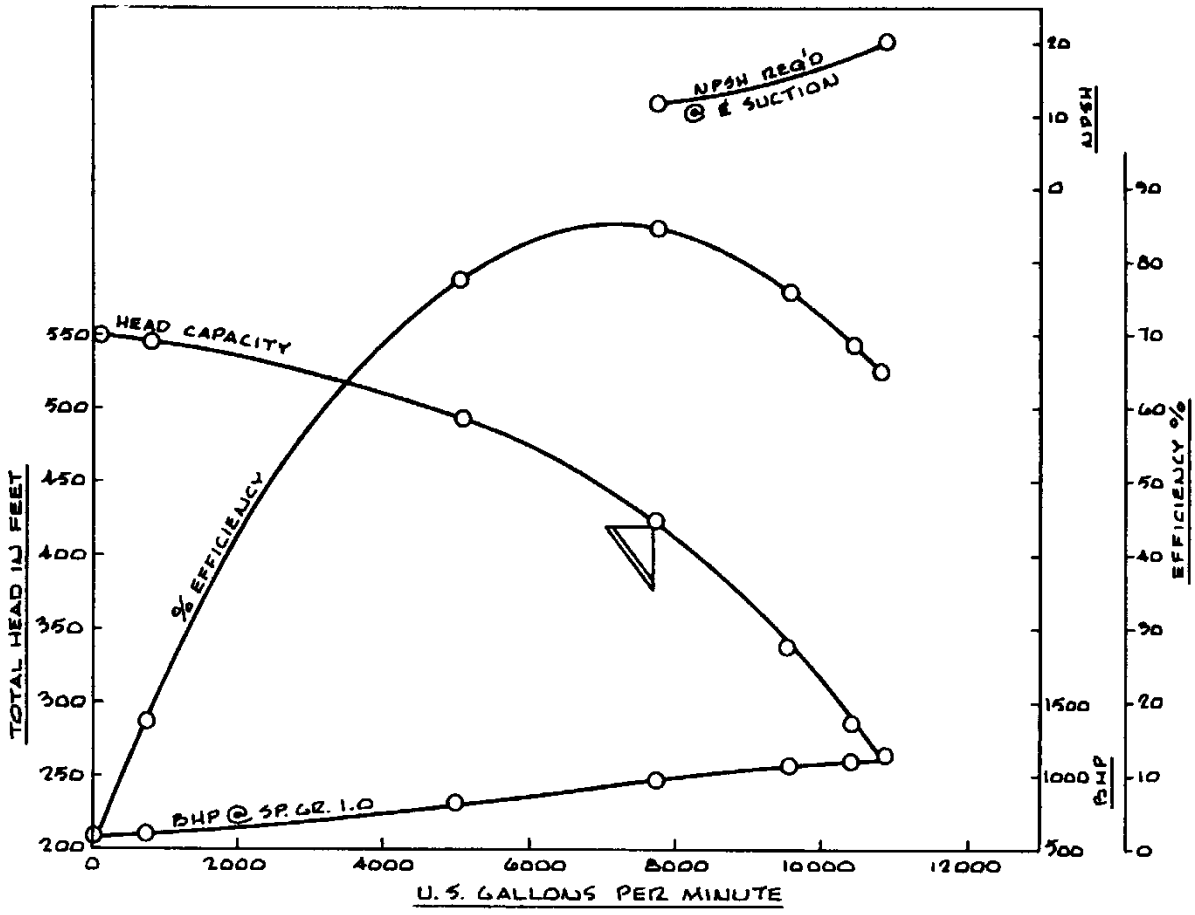
NOTES:

A. DELETED
B. ACCIDENT RECIRC LINE BREAK IN SIDE 2 WITH TWO PUMP OPERATION AND STRAINER (SEE NOTE 13) PLUGGED (20 PSIG).
C-1. POST ACCIDENT CONTAINMENT SPRAY W/HEAT REJECTION WITH TWO PUMP OPERATION AND STRAINER (SEE NOTE 13) PLUGGED. (NORMAL SUPPRESSION POOL TEMPERATURE).
C-2. POST ACCIDENT CONTAINMENT SPRAY W/HEAT REJECTION WITH ONE PUMP OPERATION AND STRAINER (SEE NOTE 13) PLUGGED. (PEAK SUPPRESSION POOL TEMPERATURE).
E. NORMAL SHUTDOWN AFTER BLOWDOWN TO MAIN CONDENSER. (SEE NOTE 8)
F. CONTINUATION OF NORMAL SHUTDOWN FROM PLANT MODE E (Ø PSIG) & FUNCTIONAL TEST FOLLOWING SHUTDOWN.
G. ACCIDENT W/RECIRC LINE BREAK IN SIDE 1 WITH STRAINER (SEE NOTE 13) PLUGGED AND TWO PUMP OPERATION Ø PSIG.
H. RHR SYSTEM TEST DURING PLANT OPERATION.
J. MINIMUM FLOW BYPASS MODE. SINGLE PUMP MINIMUM FLOW OF 330 GPM AND DUAL PUMP FLOW OF 625 GPM EVAULUATED AS ACCEPTABLE PER EER 88-0295 R1.

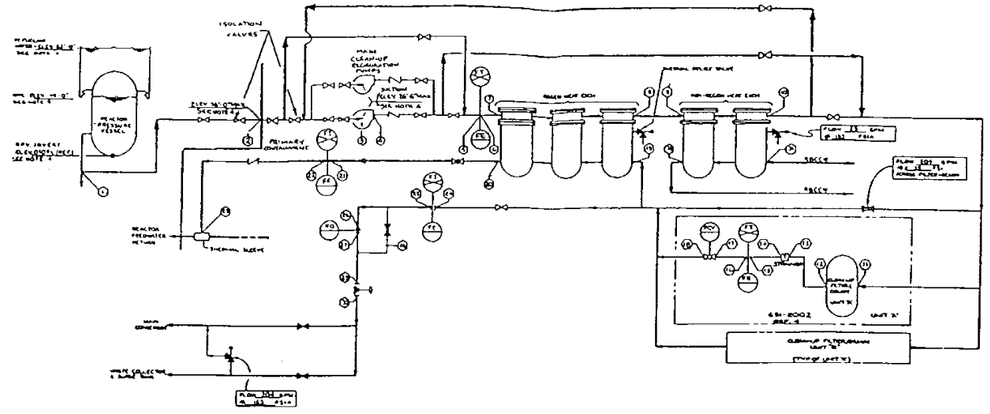
NOTES:

1. PIPING DESIGNER SHALL FILL IN THE EMPTY DATA BLANKS BASED ON HIS PIPING LAYOUT AND SUBMIT TO APED FOR INFORMATION. IF SIDE I AND SIDE II ARE NOT ASYMETRICALLY ARRANGED, VALUES FOR BOTH SHALL BE SUBMITTED, SEE SHEET 2.
2. THE MINIMUM PUMP NPSH AVAILABLE THAT OCCUR DURING MODE E MUST BE EQUAL TO OR GREATER THAN 24 FEET.
3. ELEVATIONS ARE NOT INCLUDED IN P VALUES GIVEN. ELEVATIONS SHALL BE INCLUDED WHEN DETERMINING FINAL VALUES FOR THE EMPTY DATA BANKS.
4. DASHED LINES INDICATE FLOW DOES NOT PASS THROUGH THESE POINTS.
5. SERVICE WATER CROSS-TIE SHALL BE SIZED TO FLOW 3200 GPM.
6. LINE SHALL BE SIZED BASED ON FLOW SHOWN ON FUEL POOL PROCESS DIAGRAM.
7. TABLE 1 INDICATES VALVE POSITIONS DURING VARIOUS MODES OF OPERATION.
8. SHUTDOWN OPERATION MAY BE INITIATED AT MAXIMUM REACTOR VESSEL PRESSURE OF 130 PSIG.
10. THE PRESSURE SHOWN AT POSITION 1 ON MODE C-2 IS A MIN. VALUE AT PEAK POOL TEMPERATURE FOR NPSH CALCULATION.
11. THE WEIGHT OF WATER IN THE SHUTDOWN COOLING SUBSYSTEM PIPING, INCLUDING THE HEAT EXCHANGES AND PUMPS, SHALL NOT EXCEED 225,000 LBS AT 70°F TO PREVENT DILUTION OF STANDBY LIQUID CONTROL NEUTRON ABSORBER BELOW MINIMUM REQUIREMENTS.
12. 19, 42, 43 AND 44 ARE NO LONGER USED AS FLOWPATH IN MODE E DUE TO REMOVAL OF HEAD SPRAY CAPABILITY.
13. THE PRESSURE DROP ACROSS THE SUCTION STRAINER DURING LOCA MITIGATION IS DETERMINED IN ACCORDANCE WITH REGULATORY GUIDE 1.82 REV. 2 AND THE BWR OWNERS GROUP "UTILITY RESOLUTION GUIDANCE FOR ECCS SUCTION STRAINER REPLACEMENT".
14. THE MINIMUM PUMP NPSH AVAILABLE THAT OCCURS DURING MODE C-2 MUST BE EQUAL TO OR GREATER THAN 16.6 FEET.
15. THE MINIMUM PUMP NPSH AVAILABLE THAT OCCURS DURING MODE G MUST BE EQUAL TO OR GREATER THAN 20.2 FEET.
16. DRAWING Ø-FP-05555 IS THE PARENT DRAWING TO THIS FIGURE.
17. SEE TABLE 6-9 FOR LONG TERM PRIMARY CONTAINMENT RESPONSE FOR VARIOUS RHR COOLING MODES.
18. HEAT EXCHANGER DUTY AND TEMPERATURE VALUES OBTAINED FROM GE RHR Hx SPECIFICATION (21A9227) AND PERFEX VENDOR MANUAL FP-05652.

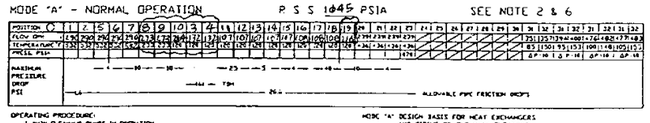
RESIDUAL HEAT REMOVAL PUMP CHARACTERISTIC CURVE (TYPICAL)



REACTOR WATER CLEANUP SYSTEM PROCESS DIAGRAM



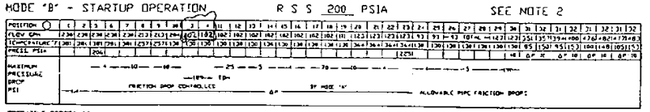
MODE 'A' - NORMAL OPERATION — R S S 1045 PSIA — SEE NOTE 2 & 6



OPERATING PROCEDURE:
1. MAIN CLEANUP PUMPS IN OPERATION
2. RHX UNDER FULL LOAD
3. MHX's UNDER PARTIAL LOAD
4. FILTER-DEMINERALIZER IN OPERATION
5. FCV IN OPERATION
6. NO BYPASS FLOW

MODE 'A' DESIGN BASIS FOR HEAT EXCHANGERS AND SIZING OF THE MAIN CLEAN-UP PUMPS DISCHARGE PIPING

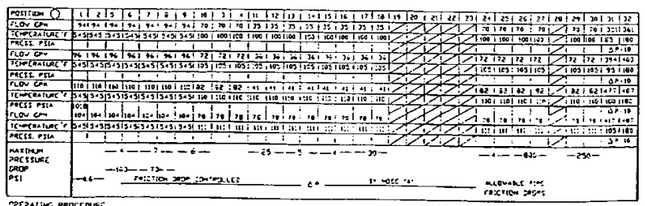
MODE 'B' - STARTUP OPERATION — R S S 200 PSIA — SEE NOTE 2



OPERATING PROCEDURE:
1. MAIN CLEANUP PUMPS IN OPERATION
2. RHX UNDER FULL LOAD
3. MHX's UNDER PARTIAL LOAD
4. FILTER-DEMINERALIZER IN OPERATION
5. FCV IN OPERATION
6. ONE (1) RHX'S ARE DISCHARGED TO RADWASTE OR CONDENSER

MODE 'A' DESIGN BASIS FOR HEAT EXCHANGERS AND SIZING OF THE MAIN CLEAN-UP PUMPS DISCHARGE PIPING

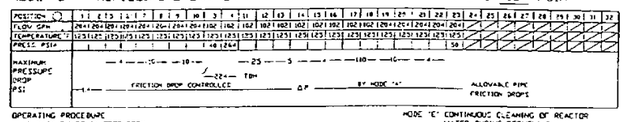
MODE C - BLOWDOWN OPERATION



OPERATING PROCEDURE
1. MAIN PUMP IN OPERATION
2. RHX UNDER NO LOAD
3. MHX's UNDER FULL LOAD
4. FILTER-DEMINERALIZER IN OPERATION
5. FCV IN OPERATION
6. ENTIRE FLOW IS DISCHARGED TO RADWASTE OR CONDENSER

MODE 'C' OPERATION LIMITATIONS & DESIGN BASIS FOR BY-PASS OPERATE

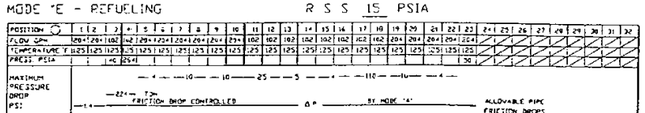
MODE 'D' - REFUELING OPERATON (MAX BYPASS) — R S S 15 PSIA



OPERATING PROCEDURE
1. MAIN PUMPS IN OPERATION
2. NO RHX LOAD
3. NO MHX LOAD
4. FILTER-DEMINERALIZERS IN OPERATION
5. FCV IN OPERATION
6. ENTIRE FLOW IS DISCHARGED TO RADWASTE OR CONDENSER

MODE 'E' CONTINUOUS CLEANING OF REACTOR WATER DURING REFUELING

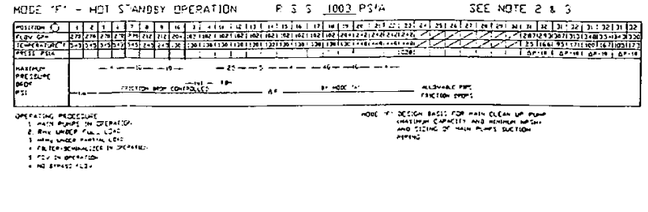
MODE 'E' - REFUELING — R S S 15 PSIA



OPERATING PROCEDURE
1. MAIN PUMPS IN OPERATION
2. NO RHX LOAD
3. NO MHX LOAD
4. FILTER-DEMINERALIZERS IN OPERATION
5. FCV IN OPERATION
6. NO BYPASS FLOW

MODE 'E' CONTINUOUS CLEANING OF REACTOR WATER DURING REFUELING

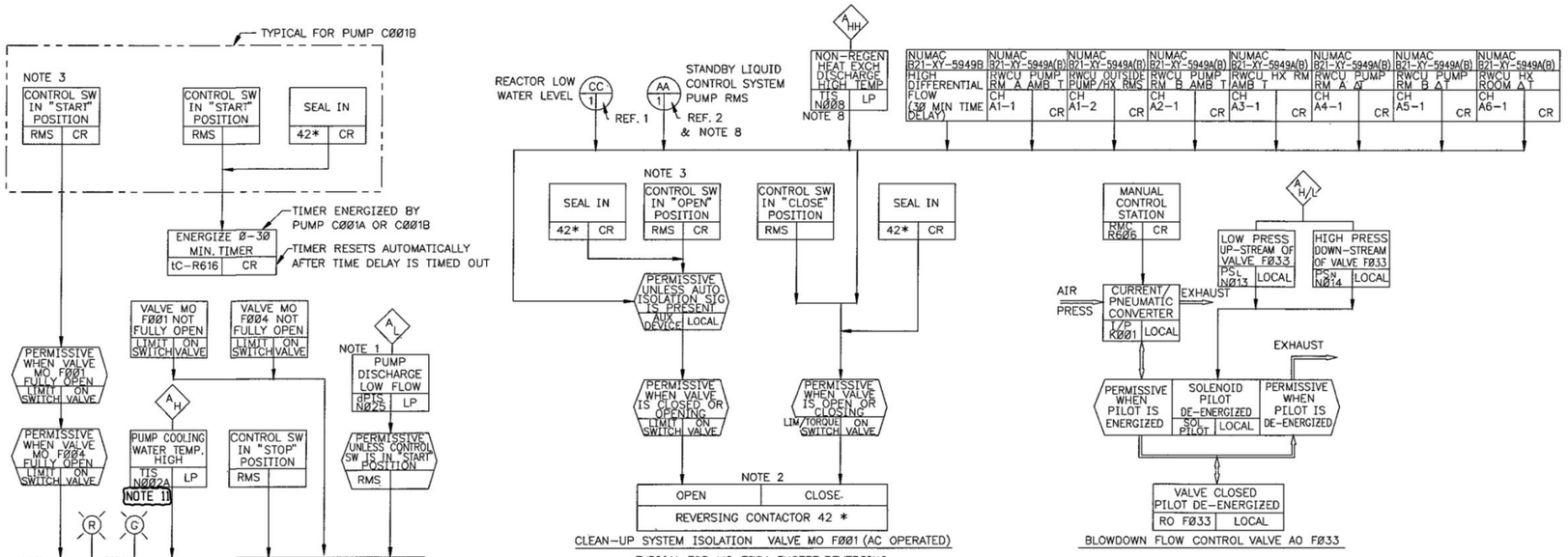
MODE 'F' - HOT STANDBY OPERATION — R S S 1003 PSIA — SEE NOTE 2 & 5



OPERATING PROCEDURE
1. MAIN PUMPS IN OPERATION
2. RHX UNDER FULL LOAD
3. MHX's UNDER PARTIAL LOAD
4. FILTER-DEMINERALIZER IN OPERATION
5. FCV IN OPERATION
6. NO BYPASS FLOW

MODE 'F' DESIGN BASIS FOR MAIN CLEAN UP PUMP MINIMUM CAPACITY AND MINIMUM NPSH AND SIZING OF MAIN PUMPS SUCTION PIPING

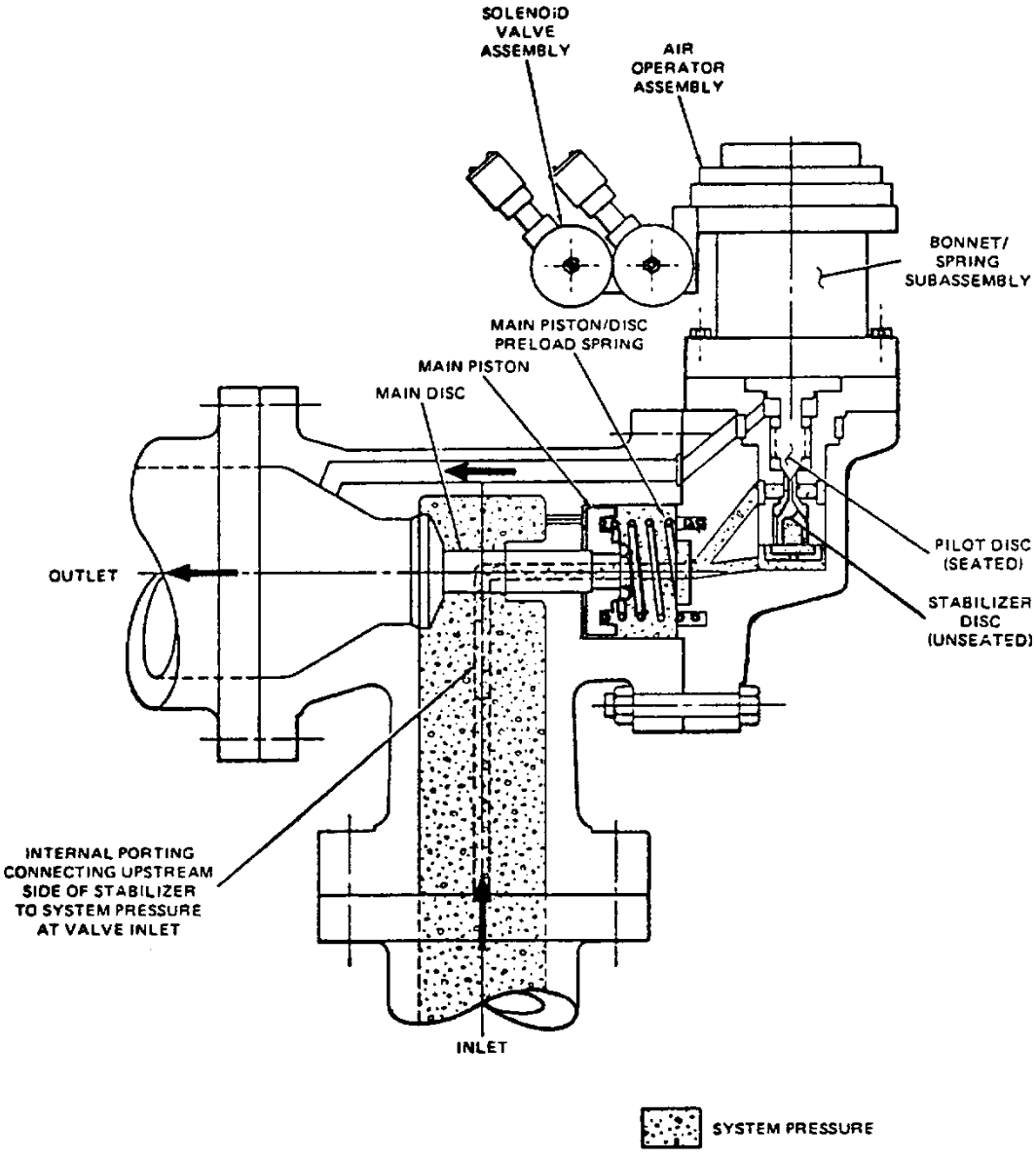
REACTOR WATER CLEANUP SYSTEM FUNCTIONAL CONTROL DIAGRAM



NOTES:
1. INTERLOCK PUMP START-UP CIRCUIT WITH PUMP DISCHARGE LOW FLOW SWITCH TO PERMIT PUMP TO BE STARTED. PUMPS TRIP OFF AFTER START IF FLOW IS NOT ESTABLISHED AFTER A TIME DELAY OR IS INTERUPTED.
2. INFORMATION ON ALARMS. VALVE INDICATING LIGHT REQUIREMENTS AND PROCESS INSTRUMENTATION REQUIREMENTS WHICH ARE NOT SHOWN ON ECD, MAY BE OBTAINED FROM THE SYSTEM P&ID REFERENCE 3.
3. CONTROL SWITCH 3-POSITION SWITCH SPRING RETURN TO BLANK UNLESS OTHERWISE SPECIFIED.
4. SELECTOR SWITCH 2-POSITION MAINTAINED CONTACT SELECTOR SWITCH UNLESS OTHERWISE SPECIFIED.
5. FOR LOCATION AND IDENTIFICATION OF INSTRUMENTS SEE INSTRUMENT DATA SHEET LISTED IN NPL FOR EACH INSTRUMENT.
6. ALL EQUIPMENT & INSTRUMENTS ARE PREFIXED BY SYSTEM NO. G31 OR G33.
7. ALL MOTOR OPERATED GATE VALVES REQUIRE SEAL-IN. MOTOR OPERATED GLOBE TYPE VAVLES DO NOT REQUIRE SEAL-IN.
8. SIGNAL USED TO CLOSE ISOLATION VALVE F004 ONLY.
9. B21-XY-5949A CH A1-1, A1-2, A2-1, A3-1, A4-1, A5-1, A6-1 AND B21-XY-5949B HI DIFF FLOW CLOSE VALVE F001. B21-XY-5949B CH A1-1, A1-2, A2-1, A3-1, A4-1, A5-1, A6-1 AND HI DIFF FLOW CLOSE VALVE F004.
10. ALL PUMPS AND MOTOR OPERATED VALVES MOTORS SHALL HAVE THERMAL OVERLOAD TRIP.
11. FOR PUMPS THAT CONTAIN CANNED MOTORS: CANNED MOTOR THERMAL NECK OR MOTOR WINDING TEMPERATURE HIGH.

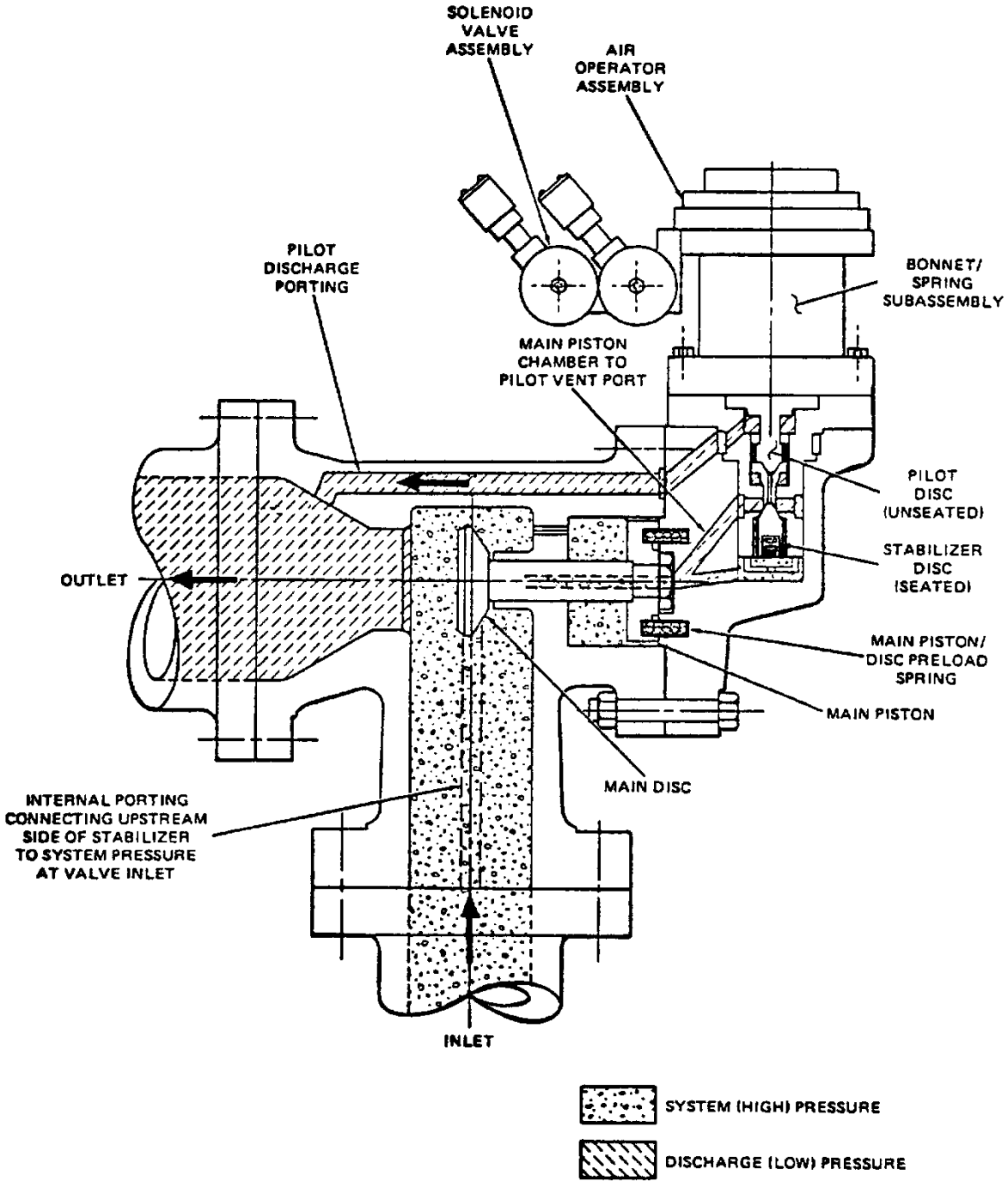
LEGEND:
* = SWITCHGEAR DEVICE FUNCTION NUMBERS USAS SPEC. C37.2.

SAFETY RELIEF VALVE (CLOSED POSITION)



NOTE: BNP utilizes one solenoid valve, not two as shown.

SAFETY RELIEF VALVE (OPEN POSITION)



NOTE: BNP utilizes one solenoid valve, not two as shown.