

OPERATING DATA

SEE NOTES 6, 7

	PSIG	LBS/HR	* F	REMARKS
1	966	4871689	542	
2	959	186954	541	75%LOAD
3	959	188651	541	75%LOAD
4	959	187432	541	STARTUP
5	966	1612354	542	BYPASS
6	966	1289266	542	BYPASS
7	966	836	542	
8	150	24377	378	
9	959	53442	541	25%LOAD
10	959	30108	541	STARTUP
11	959	25213	541	
12	164	94847	511	
13	966	3889948	542	

DESIGN DATA

#	NORMAL		UPSET			REMARKS
	PSIG	F	PSIG	F	TIME	
1	1250	575	1250	575		
4	180	400	180	400		
6	248	512	248	512		

REFERENCES:

- 302-0012-00000 REHEAT STEAM SYSTEM N11
- 302-0014-00000 REHEAT REHEATING STEAM SYSTEM N11
- 302-0121-00000 MAIN REHEAT EXTRACTION AND MISCELLANEOUS DRAINS N22
- 302-0123-00000 MAIN REHEAT EXTRACTION AND MISCELLANEOUS DRAINS N22
- 302-0124-00000 MAIN REHEAT EXTRACTION AND MISCELLANEOUS DRAINS N22
- 302-0125-00000 MAIN REHEAT EXTRACTION AND MISCELLANEOUS DRAINS N22
- 302-0131-00000 CONDENSER AIR REMOVAL SYSTEM N62
- 302-0141-00000 STEAM SEAL SYSTEM N33
- 302-0183-00000 TURBINE PLANT SAMPLING SYSTEM P33
- 302-0751-00000 OFF GAS SYSTEM N64
- 828E455CA GE MED NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM ELEMENTARY
- 199A9894 GE TURBINE INTERCONNECTION DIAGRAM
- 302-0021-00000 STEAM BYPASS AND PRESSURE REGULATION SYSTEM C85
- 302-0025-00000 NUCLEAR BOILER SYSTEM B21
- 802-0009-00000 REACTOR TURBINE GENERATOR TRIP DIAGRAM
- 911-0005-00000 LUBE OIL AREA TURBINE LAY-DOWN AND WATER TREATMENT
- 911-0005-00000 BUILDING DRAINS P68

NOTES:

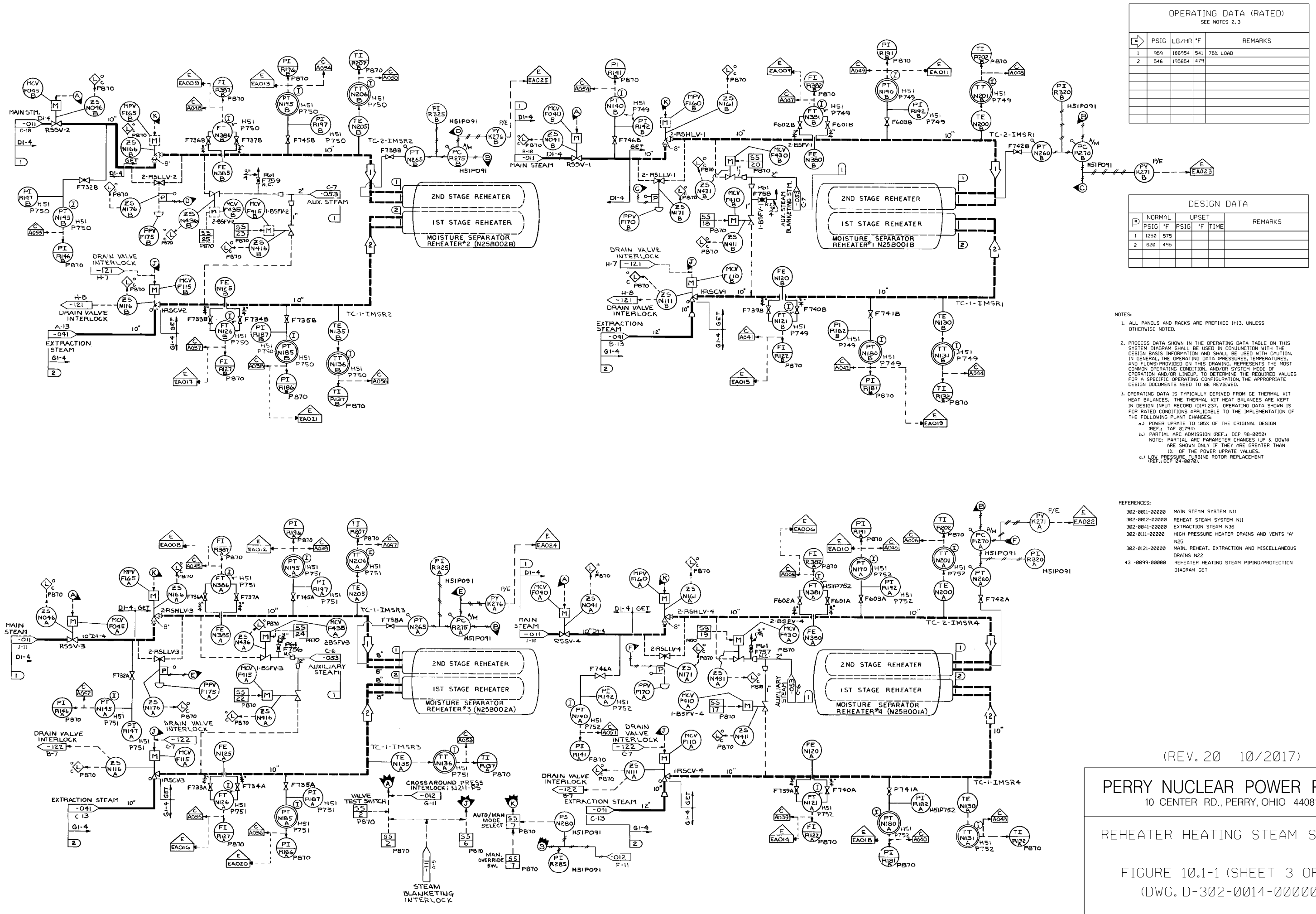
- PRESSURE TAPS TO MEET ASME PTC194 "STEAM TURBINE" PARAGRAPH 4.7.4.
- REACTOR FEEDWATER PUMP TURBINE SHOWN ON GE DWG. 505E4190C.
- CONDENSER SHOWN ON I-R DWG. N4-WR04-501X116 (SHEETS).
- MAIN STEAM STOP AND CONTROL VALVE ASSEMBLY SHOWN ON GE DWG. 832E057
- ALL PANELS AND RACKS ARE PREFIXED THIS, UNLESS OTHERWISE NOTED.
- PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING, REPRESENTS THE MOST COMMON OPERATING CONDITION AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP. TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
- OPERATING DATA IS TYPICALLY DERIVED FROM GE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - a) POWER UPRATE TO 105% OF THE ORIGINAL DESIGN (REF.: TAF 01794)
 - b) PARTIAL ARC ADMISSION (REF.: DCP 98-00580)
 - NOTE: PARTIAL ARC PARAMETER CHANGES (UP & DOWN) ARE SHOWN ONLY IF THEY ARE GREATER THAN 1% OF THE POWER UPRATE VALUES.
 - c) LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF.: ECP 04-0070).
- THIS PORTION OF PIPING IS DESIGNATED AS E32 (MSIV LEAKAGE CONTROL) FOR ASME CODE PURPOSES ONLY.

(Rev. 18 10/13)

PERRY NUCLEAR POWER PLANT
10 CENTER RD., PERRY, OHIO 44081

MAIN STEAM SYSTEM, UNIT 1

FIGURE 10.1-1 (SHEET 1 OF 3)
(DWG. D-302-0011-00000)



OPERATING DATA (RATED)				
SEE NOTES 2, 3				
ITEM	PSIG	LB/HR	°F	REMARKS
1	959	186954	541	75% LOAD
2	546	195854	479	

DESIGN DATA				
ITEM	NORMAL PSIG	NORMAL °F	UPSET PSIG	UPSET °F
1	1250	575		
2	620	495		

- NOTES:
- ALL PANELS AND RACKS ARE PREFIXED IH13, UNLESS OTHERWISE NOTED.
 - PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING REPRESENTS THE MOST COMMON OPERATING CONDITION, AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP, TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
 - OPERATING DATA IS TYPICALLY DERIVED FROM GE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - a. POWER UPGRADE TO 105% OF THE ORIGINAL DESIGN (REF.: IAP 81794)
 - b. PARTIAL ARC ADMISSION (REF.: DCP 98-0050)
 - NOTE: PARTIAL ARC PARAMETER CHANGES (UP & DOWN) ARE SHOWN ONLY IF THEY ARE GREATER THAN 1% OF THE POWER UPGRADE VALUES.
 - c. LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF.: ECP 04-0070).

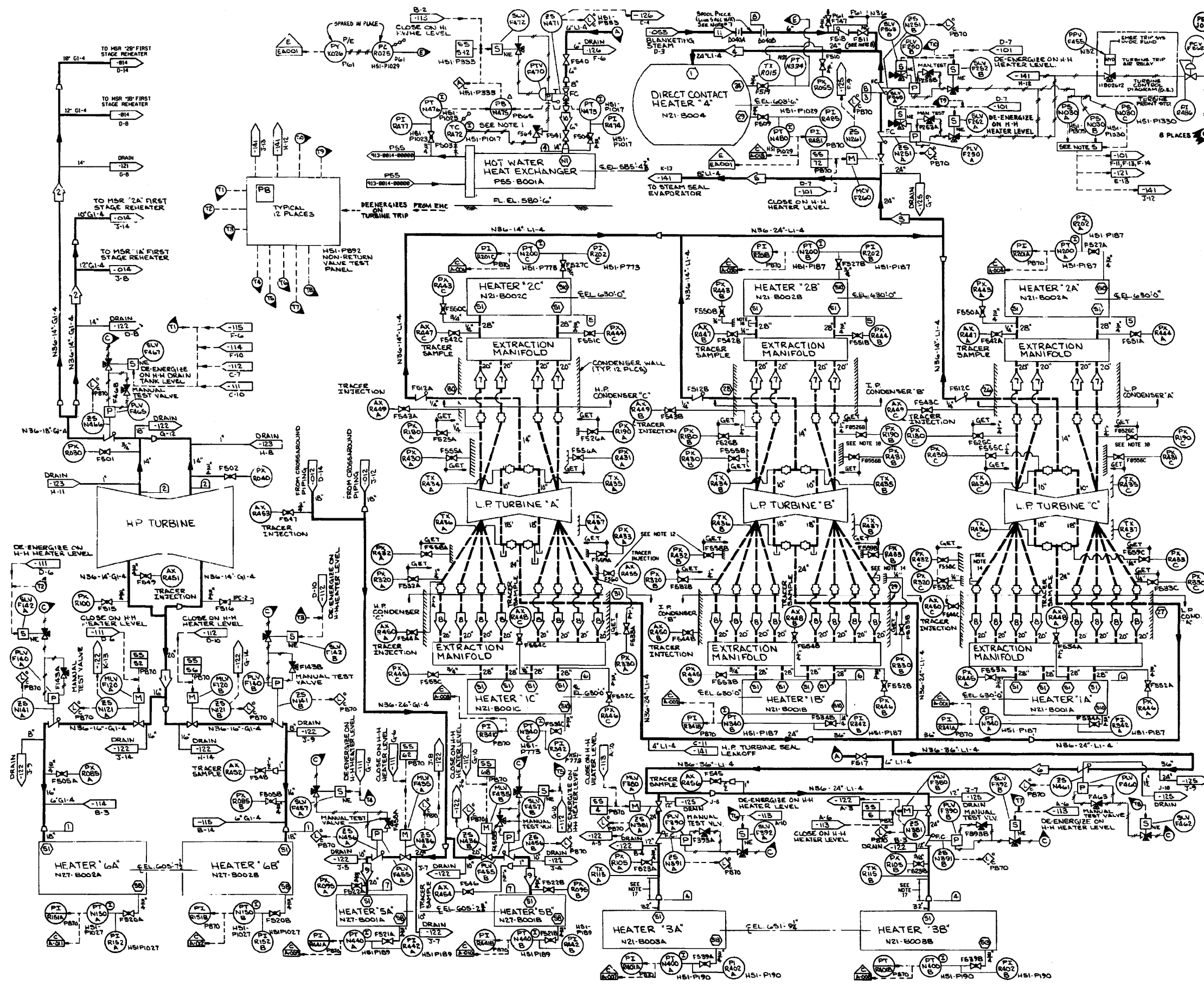
- REFERENCES:
- 302-0011-00000 MAIN STEAM SYSTEM N11
 - 302-0012-00000 REHEAT STEAM SYSTEM N11
 - 302-0041-00000 EXTRACTION STEAM N36
 - 302-0111-00000 HIGH PRESSURE HEATER DRAINS AND VENTS 'A' N25
 - 302-0121-00000 MAIN, REHEAT, EXTRACTION AND MISCELLANEOUS DRAINS N22
 - 43-0099-00000 REHEATER HEATING STEAM PIPING/PROTECTION DIAGRAM GET

(REV. 20 10/2017)

PERRY NUCLEAR POWER PLANT
10 CENTER RD., PERRY, OHIO 44081

REHEATER HEATING STEAM SYSTEM

FIGURE 10.1-1 (SHEET 3 OF 3)
(DWG. D-302-0014-00000)



OPERATING DATA (RATED)				
SEE NOTES 9 & 11				
LB/HR	PSIA	F	REMARKS	
1	873.789	362	435	4th STAGE EXTRACTION
2	391.789	361	479	2nd STAGE
3	382.119	187	412	8th STAGE
4	386.758	187	412	8th STAGE
5	23.361	187	412	8th STAGE
6	789.824	64	318	1st STAGE
7	54.959	19.6	227	11th STAGE (VAPOR)
8	1.497	19.6	227	11th STAGE (MOISTURE)
9	19.228	5.3	164	13th STAGE (VAPOR)
10	5.387	5.3	164	13th STAGE (MOISTURE)
11	4.779	5.3	164	12th STAGE (MOISTURE BLOWDOWN)
12	382.533	195	388	
13	48.800	65.4	286	
14	8	165	366	MAXIMUM SHUTDOWN

- REFERENCES:
- 382-0014-00000 REHEAT HEATING STEAM SYSTEM N11
 - 382-0181-00000 CONDENSATE SYSTEM N21
 - 382-0111-00000 HIGH PRESSURE HEATER DRAINS AND VENTS "A" SYSTEM N25
 - 382-0112-00000 HIGH PRESSURE HEATER DRAINS AND VENTS "B" SYSTEM N25
 - 382-0113-00000 LOW PRESSURE HEATER DRAINS AND VENTS SYSTEM N25
 - 382-0121-00000 MAIN REHEAT, EXTRACTION, AND MISCELLANEOUS DRAINS SYSTEM N22
 - 382-0122-00000 MAIN REHEAT, EXTRACTION, AND MISCELLANEOUS DRAINS SYSTEM N22
 - 382-0123-00000 MAIN REHEAT, EXTRACTION, AND MISCELLANEOUS DRAINS SYSTEM N22
 - 382-0125-00000 MAIN REHEAT, EXTRACTION, AND MISCELLANEOUS DRAINS SYSTEM N22
 - 382-0141-00000 STEAM SEAL SYSTEM N23
 - 382-0142-00000 HOT WATER HEATING SYSTEM N23
 - 382-0143-00000 BUILDING AND TURBINE POWER COMPLEX P25
 - 382-0144-00000 TURBINE CONTROL, DIAGRAM SYSTEM N22 (G.E.)
 - 382-0145-00000 HIGH PRESSURE HEATER DRAINS AND VENTS "B" SYSTEM N25
 - 382-0146-00000 EXTRACTOR DIAGRAM (G.E.)
 - 382-0147-00000 REHEAT HEATING STEAM SYSTEM N11
 - 382-0148-00000 HOT WATER HEATING SYSTEM N23
 - 382-0149-00000 MAIN REHEAT, EXTRACTION, AND MISCELLANEOUS DRAINS SYSTEM N22
 - 382-0150-00000 AUXILIARY STEAM SYSTEM N21

DESIGN DATA				
PS	NORMAL	UPSET	TIME	REMARKS
1	395	450		
2	629	495		
3	110	430		
4	75	330		
5	50	240		
6	50	185		
7	200	305		
8	120	430		

- NOTES:
- PRESSURE INSTALLED ENERGIZES WHEN SHELL PRESSURE EXCEEDS TURBINE PRESSURE.
 - ALL INSTRUMENTS AND CONTROL DEVICES CARRY PREFIX NO. EXCEPT AS NOTED.
 - ALL PANELS OR RACKS ARE PREFIXED THIS, UNLESS OTHERWISE NOTED.
 - ALL VALVES IN THE N25 AND N26 HEATER EXTRACTION LINES AND THE 1ST STAGE REHEATER STEAM SUPPLY LINES ARE CARBON STEEL.
 - TWO OUT OF THREE LOGIC.
 - ASME TEST CONNECTION VALVES F5548, 7, C, F5559A, F5559B, & C AND F5559C ARE PLUGGED INSIDE THE TURBINE CASING AND NO LONGER IN SERVICE.
 - ORR048 & B ARE 3/4" THICK BLANK ORIFICE PLATES.
 - VALVE N26F5511 HAS BEEN RENDERED INOPERABLE BY LEAK SEALANT INJECTION.
 - PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA PRESSURES, TEMPERATURES, AND FLOWS PROVIDED ON THIS DRAWING REPRESENTS THE MOST COMMON OPERATING CONDITION AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP. TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
 - ASME TEST CONNECTION LINES FOR F5528B AND C ARE REMOVED BETWEEN THE CONDENSER SHELL COUPLING AND THE TURBINE SHELL COUPLING AND PLUGGED AT THE TURBINE SHELL COUPLING AND ARE NO LONGER IN SERVICE.
 - OPERATING DATA IS TYPICALLY DERIVED FROM DE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - A. POWER UPGRADE TO 105% OF ORIGINAL DESIGN (REF. TAP B1794)
 - B. PARTIAL ARC ADMISSION (REF. DCP 98-0058)
 - C. LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF. EEP 84-0070)
 - ASME TEST CONNECTION LINES FOR F5559B & F5559C ARE CUT OFF & CAPPED ON THE CONDENSER END INTERNAL TO THE CONDENSER. THESE VALVES SHOULD REMAIN CLOSED.
 - ASME TEST CONNECTION LINES FOR F5528A, F5559A & F5559B ARE CUT OFF & CAPPED ON THE CONDENSER END INTERNAL TO THE CONDENSER. THE VALVES SHOULD REMAIN CLOSED.
 - ASME TEST CONNECTION LINES FOR F5532C & F5533B ARE REMOVED BETWEEN COND. SHELL/TURBINE & CAPPED AT TURBINE. VALVES SHOULD REMAIN CLOSED.
 - VENDOR DRAWING 43-0168-00001 PROVIDES FUNCTIONAL LOCATIONS FOR THE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINTS ASSOCIATED WITH LOW PRESSURE TURBINE A AND B. VENDOR DRAWING 43-0169-00001 PROVIDES FUNCTIONAL LOCATIONS FOR THE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINTS ASSOCIATED WITH LOW PRESSURE TURBINE C. NAMING CONVENTION FOR THE FUNCTIONAL LOCATIONS IS GIVEN BELOW.

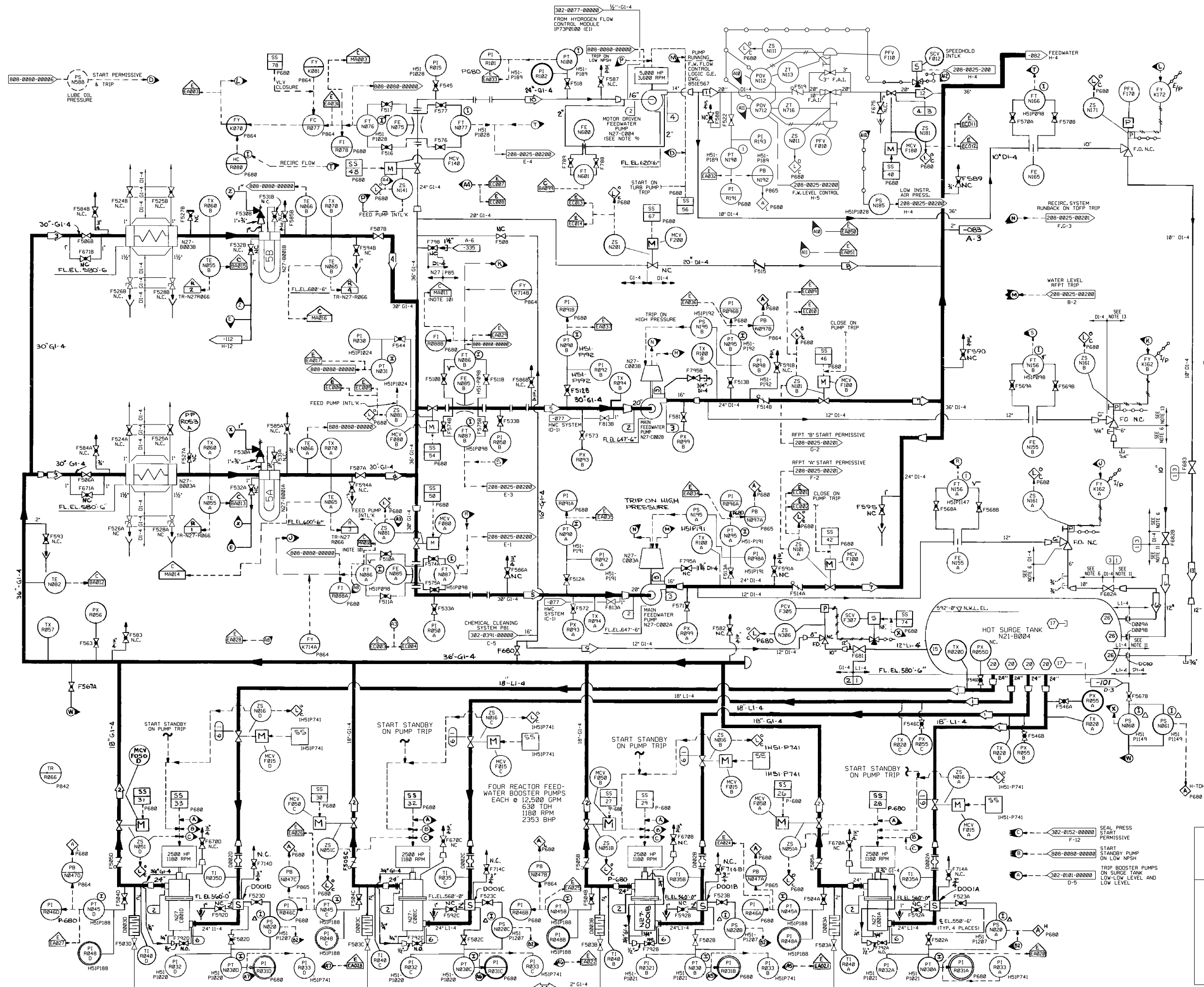
FLOC	DESCRIPTION
PT-10208041A	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041B	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041C	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041D	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041E	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041F	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041G	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041H	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041I	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041J	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041K	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041L	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041M	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041N	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041O	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041P	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041Q	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041R	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041S	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041T	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041U	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041V	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041W	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041X	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041Y	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
PT-10208041Z	8TH STAGE EXTRACTION STEAM METAL BELLOWS EXPANSION JOINT FROM L.P. TURBINE A
 - ASME TEST CONNECTION LINE FOR VALVE PY-102080828 IS REMOVED BETWEEN THE PY-102080828 NOZZLE COUPLING AND THE CONDENSER SHELL COUPLING AND PLUGGED AT THE PY-102080828 NOZZLE COUPLING.
 - EXCEPTION ON LINE SPEC L1-4, THE 32"x24" REDUCER AND THE FIRST 24" ELBOW UPSTREAM OF THE REDUCER ARE CHROME-MOLY. VALVES SHOULD REMAIN CLOSED.

(REV. 19 10/2015)

PERRY NUCLEAR POWER PLANT
10 CENTER RD., PERRY, OHIO 44081

EXTRACTION STEAM

FIGURE 10.1-2
(DWG. D-302-0041-00000)



OPERATING DATA (RATED)				
SEE NOTES 7, 8				
PSIA	GPM	°F	REMARKS	
1	108	11,991	329	
2	362	11,981	329	
3	345	17,996	329	
4	315	18,494	370	
5	292	18,494	370	
6	10	7,000	125	START-UP
7	1127	18,436	372	
8	280	7,500	75	PRESTART-UP
9	280	5,000	125	START-UP
10	292	8,300	369	
11	1120	8,270	370	UPSET CONDITION
12	1065	8,270	370	UPSET CONDITION
13	98	4,000	125	MDP START-UP
14	300	25-110	329	

DESIGN DATA				
PSIG	°F	PSIG	°F	TIME
1	120	350	120	350
2	500	400	500	400
3	1500	400	1500	400
4	1540	400	1540	400
5	120	400	120	400
6	145	350	145	350

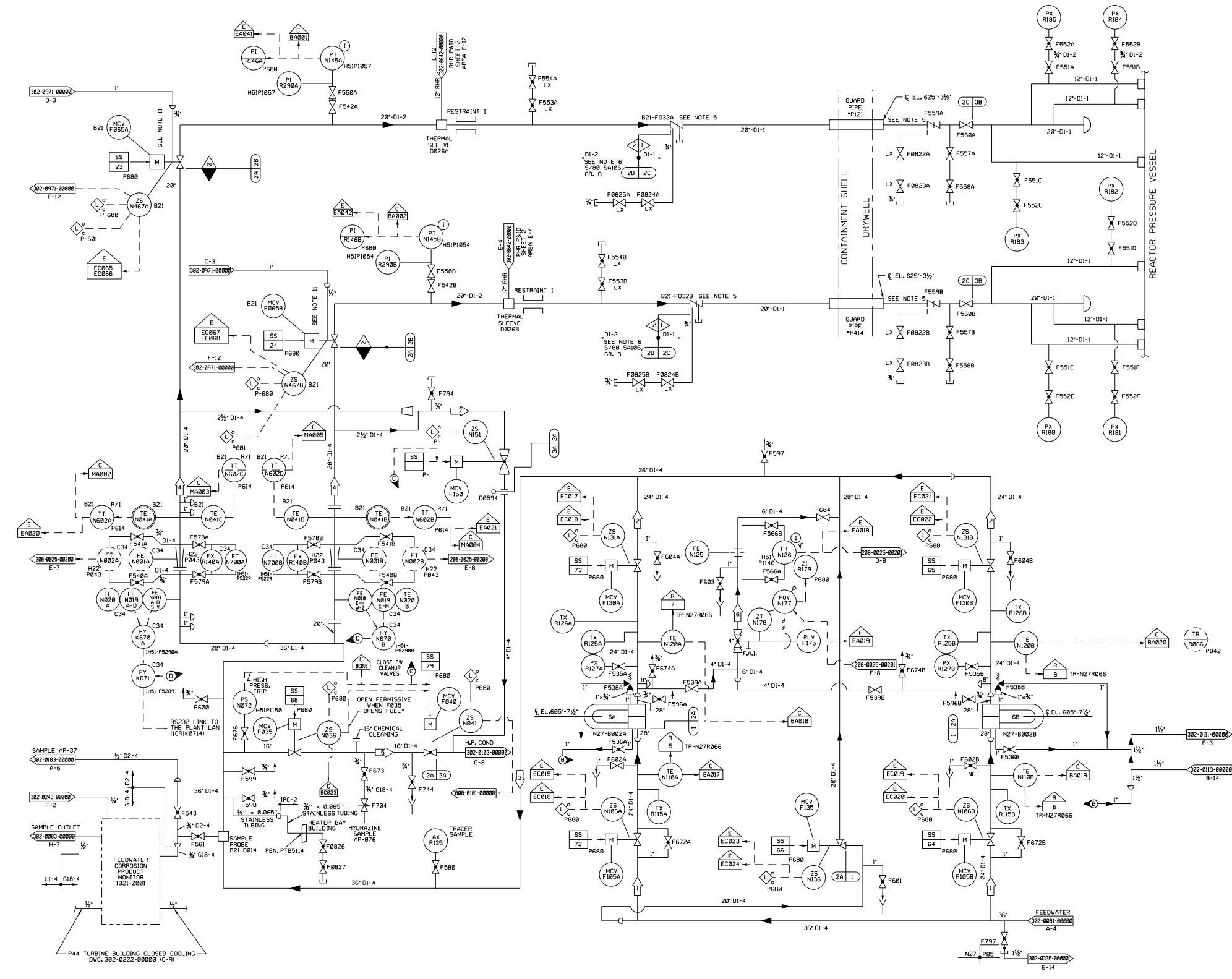
- NOTES:
- ITEMS SUPPLIED BY G.E. HAVE PREFIX B21.
 - SEAL WATER SUPPLY PRESSURE 310 PSIA.
 - PIPING DRAINS ARE 1" AND PIPING VENTS ARE 3/4" UNLESS OTHERWISE NOTED.
 - ALL INSTRUMENTS AND CONTROLS ARE PREFIXED IN27, UNLESS OTHERWISE NOTED.
 - ALL PANEL AND RACKS CARRY PREFIX IH3, UNLESS OTHERWISE NOTED.
 - PIPE TO BE ASTM A312 TP 316L.
 - PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING, REPRESENTS THE MOST COMMON OPERATING CONDITION AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP, TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
 - OPERATING DATA IS TYPICALLY DERIVED FROM GE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - POWER UPGRADE TO 105% OF THE ORIGINAL DESIGN (REF: TAF 81744).
 - PARTIAL ARC ADMISSION (REF: DCP 98-0050) NOTE: PARTIAL ARC PARAMETER CHANGES UP & DOWN ARE SHOWN ONLY IF THEY ARE GREATER THAN 1% OF THE POWER UPGRADE VALUES.
 - LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF: ECP 04-0070).
 - SEE DRAWING 26-0179-00001 FOR THE LUBE OIL SYSTEM COMPONENT INTERFACES WITH THE MOTOR DRIVEN FEEDWATER PUMP IN27C0004.
 - COMPUTER POINTS MA010 AND MA011 PROVIDE AVERAGE FEEDWATER PUMP SUCTION FLOW RATES - MA010 AVERAGES IN27N0005A & 87A; MA011 AVERAGES IN27N0006B & 87B.
 - PIPE TO BE A335 GRADE P22.
 - F.W. BOOSTER PUMP STRAINERS IN27N0001 (A, B, C, & D) HAVE A MAXIMUM WORKING PRESSURE OF 125 PSIG AT 350°F.
 - VALVE F0160B HAS AN ASME B16.34 INTERMEDIATE PRESSURE RATING OF 710 LB.

- REFERENCES:
- 208-0025-00000 FEEDWATER CONTROL SYSTEM
 - 208-0149-00000 FEEDWATER ELEMENTARY DIAGRAM
 - 302-0082-00000 FEEDWATER N27
 - 302-0083-00000 FEEDWATER PUMP INJECTION AND WARM-UP
 - 302-0101-00000 CONDENSATE SYSTEM N21
 - 302-0152-00000 CONDENSATE SEAL SYSTEM P12
 - 302-0243-00000 M.F.P. TURBINE LUBE OIL FLOW DIAGRAM
 - 302-0276-00000 EXTENDED M.F.P. TURBINE "A" FLOW DIAGRAM
 - 302-0296-00000 EXTENDED M.F.P. TURBINE "B" FLOW DIAGRAM
 - 302-0391-00000 CHEMICAL CLEANING SYSTEM P81
 - 808-0080-00000 FEEDWATER LOOP DIAGRAMS
 - 26-0179-00001 LUBE OIL SYSTEM DIAGRAM FOR IN27C0004

(REV. 20 10/2017)

PERRY NUCLEAR POWER PLANT
10 CENTER RD., PERRY, OHIO 44081

FEEDWATER
FIGURE 10.1-3 (SHEET 1 OF 2)
(DWG. D-302-0081-00000)



OPERATING DATA (RATED)				
	PSIA	GPM	°F	REMARKS
1	1127	18,436	372	
2	1113	19,188	425	
3	1113	38,377	425	
4	1100	19,188	425	
5	250	12,000	125	START-UP
6	935	600	125	START-UP
7	250	400	125	START-UP WITH DB294 OPEN

DESIGN DATA					
	PSIG	°F	PSIG	°F	TIME
1	1500	400	1500	400	
2A	1500	450	1500	450	
2B	1250	550	1500	550	<1X
2C	1250	575	1500	575	
3A	50	150	50	150	
3B	1250	575	1250	575	

• SEE NOTE 7

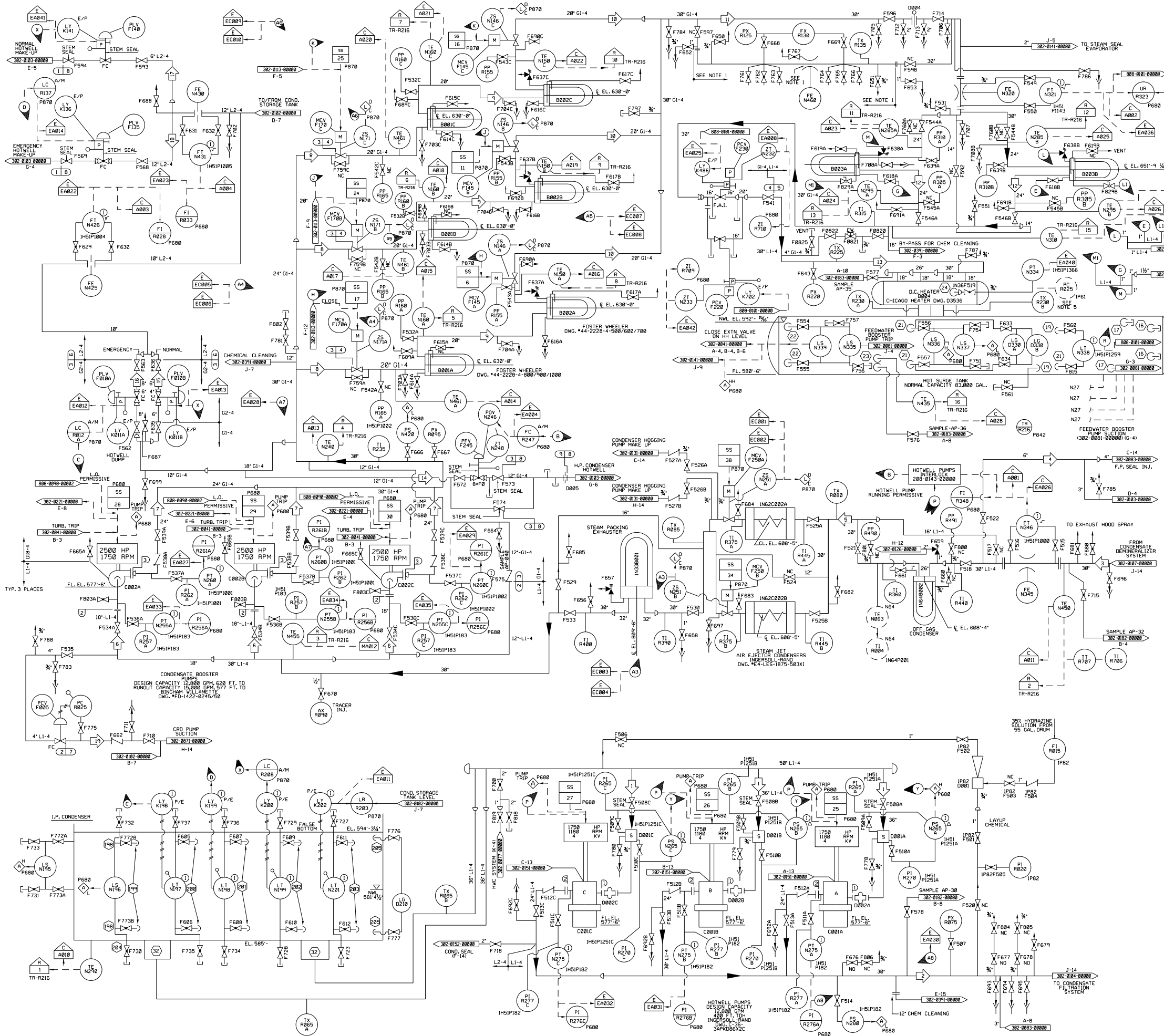
- NOTES:
- ALL PANELS AND RACKS ARE PREFIXED 1H13, UNLESS OTHERWISE NOTED.
 - ALL INSTRUMENTS AND CONTROLS ARE PREFIXED 1N27, UNLESS OTHERWISE NOTED.
 - PIPING DRAINS ARE 1" AND PIPING VENTS ARE 3/4", UNLESS OTHERWISE SPECIFIED.
 - TWO SETS OF PRESSURE TAPS ARE PROVIDED ON EACH FEEDWATER FLOW METER SECTION. PROCESS INSTRUMENT PIPING/TUBING SHALL BE RUN FROM BOTH SETS OF TAPS WITH ONE SET PERMANENTLY CONNECTED TO THE FEEDWATER FLOW TRANSMITTER AND THE ALTERNATE SET TERMINATING ADJACENT TO THE FLOW TRANSMITTER. COMPLETE WITH BLOWDOWN, INSTRUMENT SHUTOFF, AND EQUALIZING VALVE MANIFOLD TO FACILITATE IN-SERVICE MONITORING OF FLOW ELEMENT CALIBRATION UTILIZING EITHER SET OF PRESSURE TAPS.
 - CONTROLLED CLOSURE ANTIWATER HAMMER LIFT CHECK VALVES.
 - CLASS 2 PIPING MUST MEET TESTING REQUIREMENTS OF ASME III, NB-2300.
 - THE DATA IN THE NORMAL COLUMN ARE THE SYSTEM DESIGN CONDITION.
 - DOUBLE ROOT VALVES EMANATING FROM SAFETY CLASS 1 PIPING ARE SAFETY CLASS 2 AT THE POINT OF CONNECTION WITH 3/4" PIPE OR FITTING AND CLASS 1 PIPE.
 - PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING, REPRESENTS THE MOST COMMON OPERATING CONDITION, AND/OR SYSTEM MODE OF OPERATION AND/OR LINE-UP TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
 - OPERATING DATA IS TYPICALLY DERIVED FROM GE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - POWER UPGRADE TO 105% OF THE ORIGINAL DESIGN (REF.: TAF 81744).
 - PARTIAL ARC ADMISSION (REF.: DCP 98-00000) NOTE: PARTIAL ARC PARAMETER CHANGES (UP & DOWN) ARE SHOWN ONLY IF THEY ARE GREATER THAN 1% OF THE POWER UPGRADE VALUES.
 - LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF.: ECP 04-0070).
 - REDROUTED PIPE FROM PIPING HAVING A DESIGN TEMPERATURE OF 575°F TO PIPING HAVING A DESIGN TEMPERATURE OF 500°F. ANALYSIS WAS PERFORMED AT 575°F, 575°F SHALL BE USED FOR CONSERVATISM.

- REFERENCES:
- 302-0081-00000 FEEDWATER N27
 - 302-0183-00000 CONDENSING - SYSTEM N21
 - 302-0111-00000 HIGH PRESSURE HEATER DRAINS AND VENTS "A" N25
 - 302-0183-00000 TURBINE PLANT SAMPLING SYSTEM P33
 - 302-0642-00000 RESIDUAL HEAT REMOVAL E12
 - 208-0025-00000 FEEDWATER CONTROL SYSTEM C34
 - 808-0101-00000 CONDENSATE SYSTEM HOT SURGE TANK 3 ELEMENT
 - 302-0971-00000 FEEDWATER LEAKAGE CONTROL SYSTEM N27
 - 302-0222-00000 TURBINE BUILDING CLOSED COOLING SYSTEM P44

(REV. 20 10/2017)

PERRY NUCLEAR POWER PLANT
10 CENTER RD., PERRY, OHIO 44081

FEEDWATER
FIGURE 10.1-3 (SHEET 2 OF 2)
(DWG. D-302-0082-00000)



OPERATING DATA				
#	PSIA	GPM	°F	REMARKS
1	VAC	11,251	101.1	RATED
2	190	22,582	101.3	RATED
3	124	22,582	101.3	RATED
4	124	200	102.4	RATED
5	114	22,308	102.4	RATED
6	95	11,129	104.3	RATED
7	352	11,122	104.9	RATED
8	330	7,415	104.9	RATED
9	319	7,522	157.2	RATED
10	308	7,700	219.1	RATED
11	308	23,100	219.1	RATED
12	293	11,923	288.6	RATED
13	105	23,847	288.6	
14	448	5,000	103.4	STARTUP (3500 MIN.)
15	12	1,000	103.4	INTERMITTENT
16	12	2,000	103.4	INTERMITTENT
17	20	1,000	65	INTERMITTENT
18	20	2,000	65	INTERMITTENT
19	50	60	104.3	

DESIGN DATA				
#	NORMAL	UPSET	TIME	REMARKS
1	254V	135	254V	135
2	250	140	250	140
3	600	140	600	140
4	600	320	600	320
5	120	250	120	250
6	50	140	50	140
7	50	140	250	140
8	25	140	25	140

- REFERENCES:
- 302-0083-00000 FEEDWATER N27
 - 302-0102-00000 CONDENSATE TRANSFER AND STORAGE SYSTEM P11
 - 302-0103-00000 CONDENSING SYSTEM N21
 - 302-0106-00000 CONDENSATE FILTRATION SYSTEM N23
 - 302-0107-00000 CONDENSATE DEMINERALIZER SYSTEM N24
 - 302-0131-00000 CONDENSATOR AIR REMOVAL SYSTEM N62
 - 302-0141-00000 STEAM SEAL SYSTEM N33
 - 302-0183-00000 TURBINE PLANT SAMPLING SYSTEM P33
 - 302-0182-00000 TURBINE PLANT SAMPLING SYSTEM P33
 - 302-0391-00000 CHEMICAL CLEANING OF CONDENSATE AND FEEDWATER SYSTEM P81
 - 809-0101-00000 HOT SURGE TANK LOOP DIAGRAM
 - 820E250A FEEDWATER ELEMENTARY DIAGRAM
 - 302-0151-00000 CONDENSATE SEAL P12
 - 302-0152-00000 CONDENSATE SEAL P12
 - 809-0090-00000 CONDENSATE SYSTEM LOOP DIAGRAMS
 - 208-0143-00000 CONDENSATE ELEMENTARY DIAGRAM
 - 302-0113-00000 LOW PRESSURE HEATER, DRAINS, AND VENT
 - 302-0071-00000 CONTROL ROD DRIVE HYDRAULIC SYSTEM C11
 - 302-0001-00000 FEEDWATER SYSTEM N27
 - 302-0041-00000 EXTRACTION STEAM SYSTEM N36
 - 302-0126-00000 MAIN, REHEAT, EXTRACTION, AND MISC. DRAINS SYSTEM N22
 - 302-0221-00000 TURBINE BLDG. CLOSED COOLING SYSTEM P44
 - 302-0077-00000 HYDROGEN WATER CHEMISTRY SYSTEM P73
 - 302-0104-00000 CONDENSATE FILTRATION SYSTEM N23
- NOTES:
1. PIPING AND COMPONENTS MAY OR MAY NOT BE INSTALLED FOR THE TEMPORARY TEST OF FLOW NOZZLE N460 COMMON TO UNIT 1 & 2.
 2. ALL PANELS ARE PREFIXED IHI-3 UNLESS OTHERWISE NOTED.
 3. ALL DRAINS 1", VENTS 3/4" UNLESS OTHERWISE SPECIFIED.
 4. DATA IN THE UPSET COLUMN ARE THE SYSTEM DESIGN CONDITIONS.
 5. VALVE P610005 HAS BEEN REMOVED FROM THE SYSTEM AND REPLACED WITH A SPOL, PIECE AND BLANKS. THIS INSTRUMENT IS ABANDONED IN PLACE.
 6. PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING REPRESENTS THE MOST COMMON OPERATING CONDITION AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION. THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
 7. OPERATING DATA IS TYPICALLY DERIVED FROM GE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - a. POWER UPGRADE TO 105% OF THE ORIGINAL DESIGN (REF: 1AF-B1744)
 - b. PARTIAL ARC ADMISSION (REF: DCP-90-0050) NOTE: PARTIAL ARC PARAMETER CHANGES UP & DOWN ARE SHOWN ONLY IF THEY ARE GREATER THAN 1% OF THE POWER UPGRADE VALUES.
 - c. LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF: ECP-04-00700)

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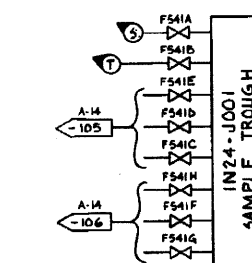
CONDENSATE
SYSTEM

FIGURE 10.1-4 (SHEET 1 OF 2)
(DWG. D-302-0101-00000)

OPERATING DATA

SEE NOTES 8, 9

LINE	PSIG	GPM	°F	REMARKS
1	145-175	22,582	181.1	NORMAL
2	175	25,427	148	MAX. FLOW
3	145-175	3,275	181.3	NORMAL
4	175	3633	148	MAX. FLOW
5	180	18,808	181.3	0.2 MIN. DURATION
6	3-15	-	-	-
7	3-9	-	-	-
8	3-15	-	-	-
9	9-15	-	-	-
10	15-3	-	-	-



DESIGN DATA

LINE	NORMAL PSIG	UPSET PSIG	°F	TIME	REMARKS
1	250	185	250	148	

NOTES:

- ALL PANELS AND PACKS ARE PREFIXED INH1, UNLESS OTHERWISE NOTED.
- DELETED
- DELETED
- DELETED
- ALL FILTERS AND PRECOAT EQUIPMENT EXCEPT HOPPER STAND ON FLOOR EL. 560'-5" REF. J.
- ALL EXTERNAL PIPING, EXCEPT SAMPLE TUBING, IS CARBON STEEL.
- TYPE "B" SAMPLE CONNECTION AS SHOWN ON DWG. 382-0771-000000.
- PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING, REPRESENTS THE MOST COMMON OPERATING CONDITION AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP. TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
- OPERATING DATA IS TYPICALLY DERIVED FROM GE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - POWER UPGRADE TO 100% OF THE ORIGINAL DESIGN (REF. J. TAP 81794)
 - PARTIAL AND ADMISSION (REF. J. DCP 98-0828)
 NOTE: PARTIAL AND ADMISSION CHANGES UP & DOWN ARE SHOWN ONLY IF THEY ARE GREATER THAN 1% OF THE POWER UPGRADE VALUES.
- LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF. J. ECP 84-0070).

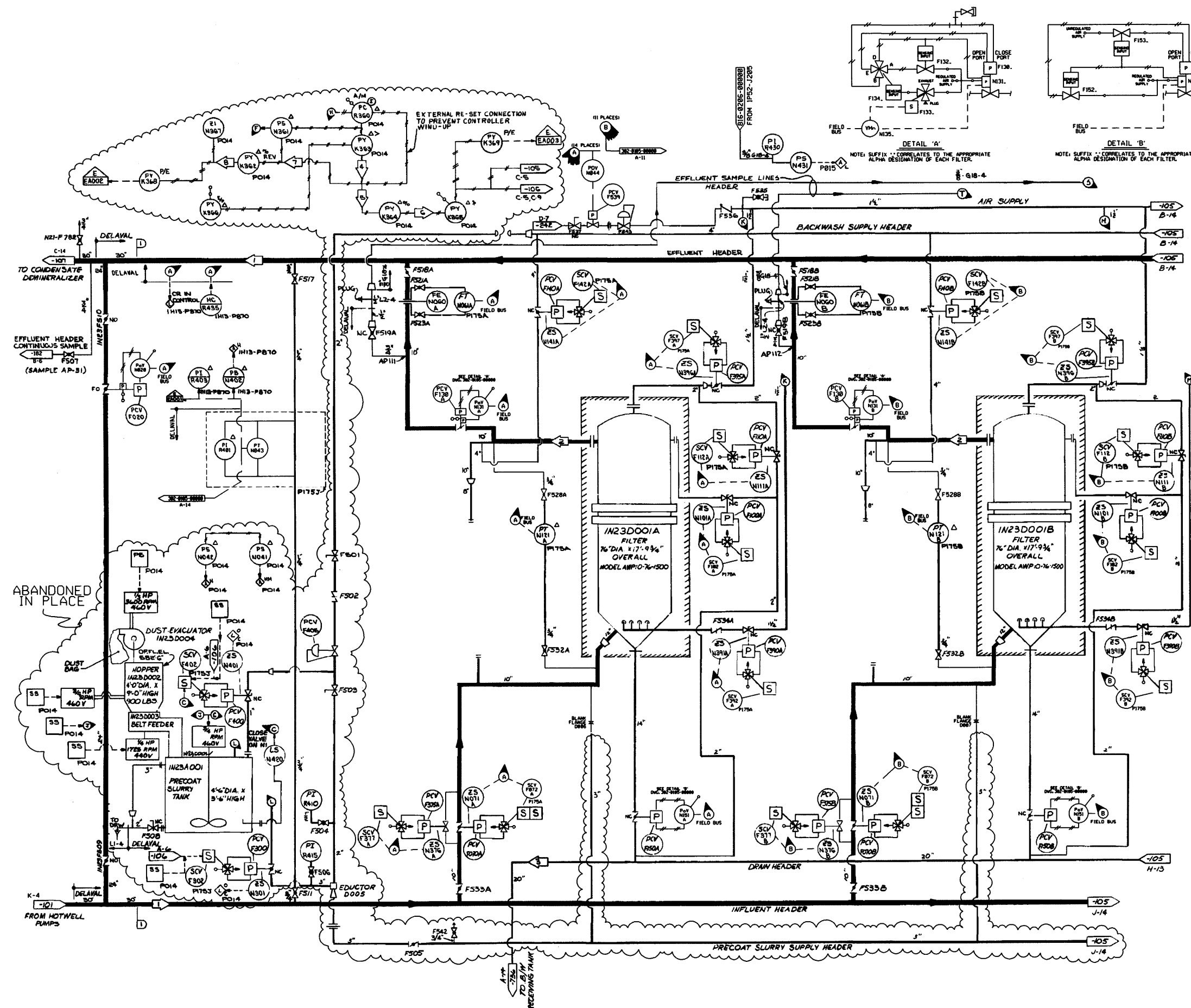
REFERENCES:

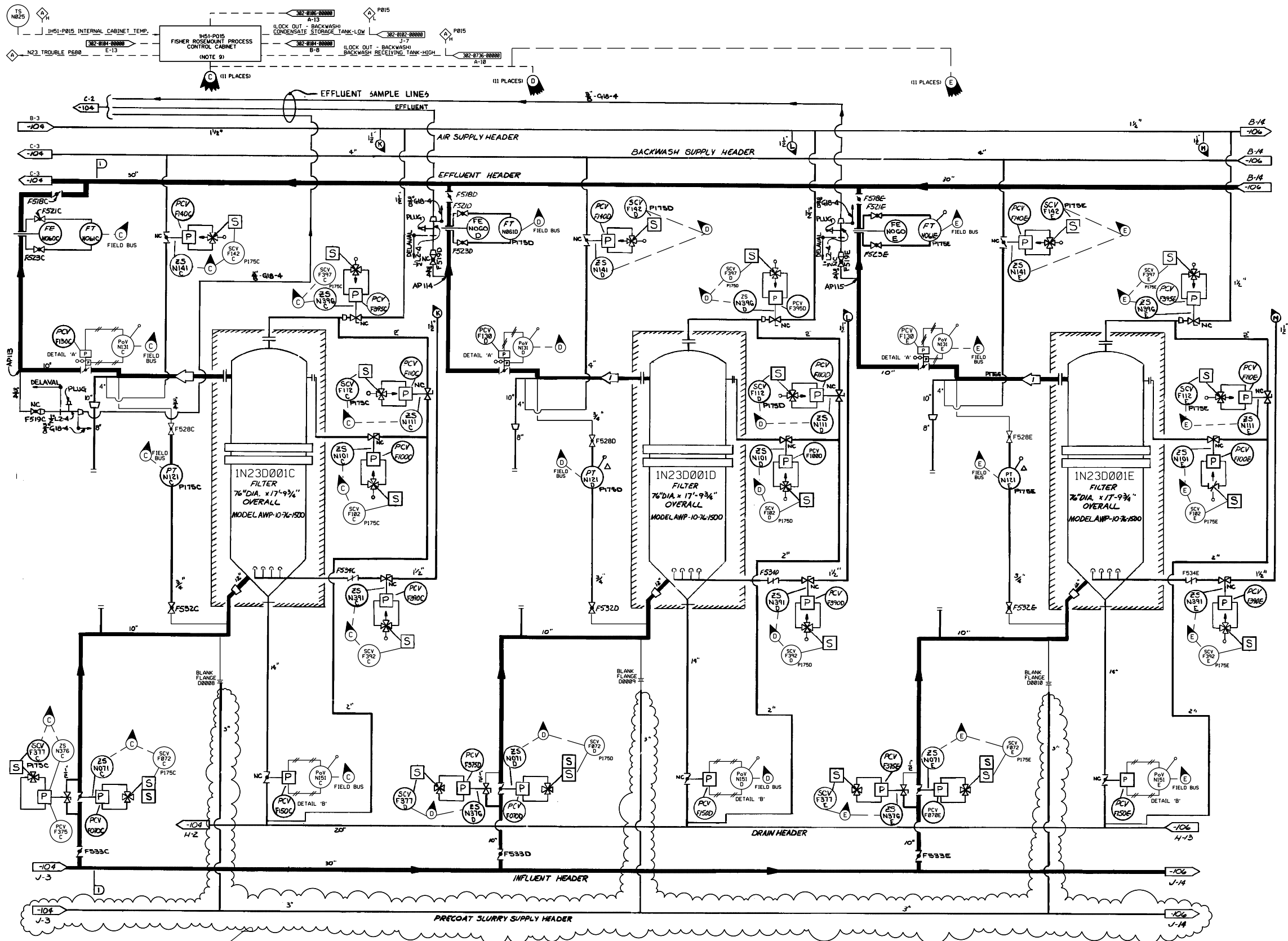
- 382-0101-00000 CONDENSATE SYSTEM N21
- 382-0105-00000 CONDENSATE FILTRATION SYSTEM N23
- 382-0106-00000 CONDENSATE FILTRATION SYSTEM N23
- 382-0107-00000 CONDENSATE DEMINERALIZER SYSTEM N24
- 382-0102-00000 TURBINE PLANT SAMPLING SYSTEM F33
- 382-0736-00000 LRV - TANKS AND PUMPS FOR HANDLING CONDENSATE BACKWASH SLURRY C58

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CONDENSATE
FILTRATION SYSTEM
FIGURE 10.1-5 (SHEET 1 OF 3)
(DWG. D-302-0104-00000)

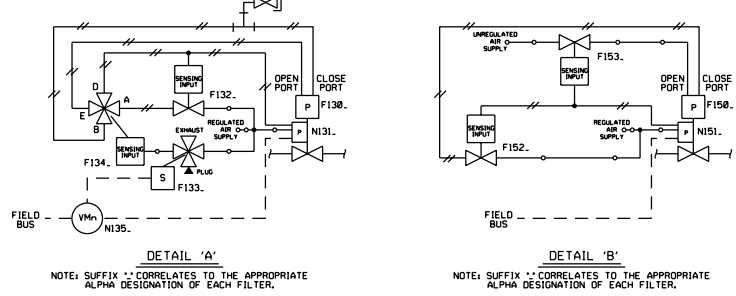




OPERATING DATA				
SEE NOTES 7, 8				
PSIG	GPM	°F	REMARKS	
1	145-175	3,215	181.3	NORMAL
1	175	3633	148	MAX.

DESIGN DATA				
D	NORMAL	UPSET	REMARKS	
PSIG	°F	PSIG	°F	TIME
1	250	185	250	148

- REFERENCES:
- 302-0184-00000 CONDENSATE FILTRATION SYSTEM N23
 - 302-0185-00000 CONDENSATE FILTRATION SYSTEM N23
- NOTES:
- ALL PANELS & RACKS ARE PREFIXED IM51, UNLESS OTHERWISE SPECIFIED.
 - DELETED
 - DELETED
 - DELETED
 - ALL FILTERS STAND ON FLOOR EL. 568'-6" (REF.).
 - ALL EXTERNAL PIPING EXCEPT SAMPLE TUBING IS CARBON STEEL.
 - PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING REPRESENTS THE MOST COMMON OPERATING CONDITION, AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP. TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
 - OPERATING DATA IS TYPICALLY DERIVED FROM GE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - a) POWER UPGRADE TO 105% OF THE ORIGINAL DESIGN (REF.: TAF 81794)
 - b) PARTIAL ARC ADMISSION (REF.: DCP 98-0050) NOTE: PARTIAL ARC PARAMETER CHANGES (UP & DOWN) ARE SHOWN ONLY IF THEY ARE GREATER THAN 1% OF THE POWER UPGRADE VALUES.
 - c) LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF.: ECP 04-0070).
 - THE CONTROL AND MONITORING OF EACH FILTER UNIT IS COMPLETED WITHIN THE FISHER ROSEMOUNT CONTROL PROCESSOR. ALL OPERATOR INPUT / OUTPUT INTERFACING IS CONDUCTED THROUGH A MONITOR AND KEYBOARD AT THE IM51P015 PANEL.
 - FXXX - VALVE IDENTIFICATION NUMBER ("X" REPRESENTING LETTER DESIGNATION).

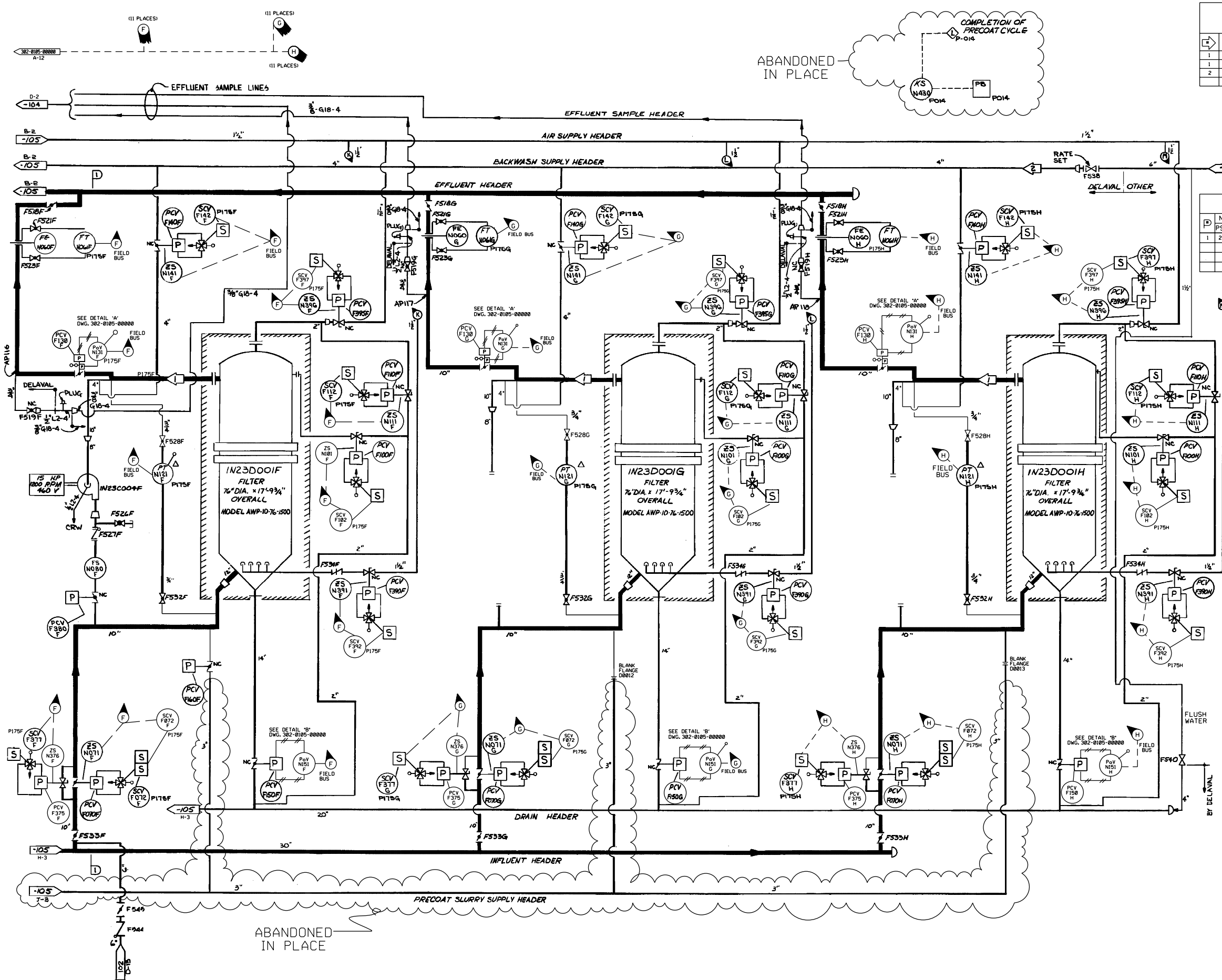


(Rev. 18 10/13)

PERRY NUCLEAR POWER PLANT
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CONDENSATE FILTRATION SYSTEM

FIGURE 10.1-5 (SHEET 2 OF 3)
(DWG. D-302-0105-00000)



OPERATING DATA				
SEE NOTES 8, 9				
PSIG	GPM	°F	REMARKS	
1	145-175	3.215	101.3	NORMAL
1	250	3633	148	MAX.
2	30	479	105	INTERMITTENT (4.4 MIN.)

DESIGN DATA				
PSIG	°F	TIME	REMARKS	
1	250	105	250	148

- REFERENCES:
- 302-0102-00000 CONDENSATE TRANSFER AND STORAGE SYSTEM P11
 - 302-0104-00000 CONDENSATE FILTRATION SYSTEM N23
 - 302-0105-00000 CONDENSATE FILTRATION SYSTEM N23
 - 302-0241-00000 SERVICE AND INSTRUMENT AIR SUPPLY P51 & P52
 - 302-0736-00000 LRW - TANKS AND PUMPS FOR BACKWASH SLURRY G50
 - 302-0771-00000 NUCLEAR SAMPLING SAMPLE P34

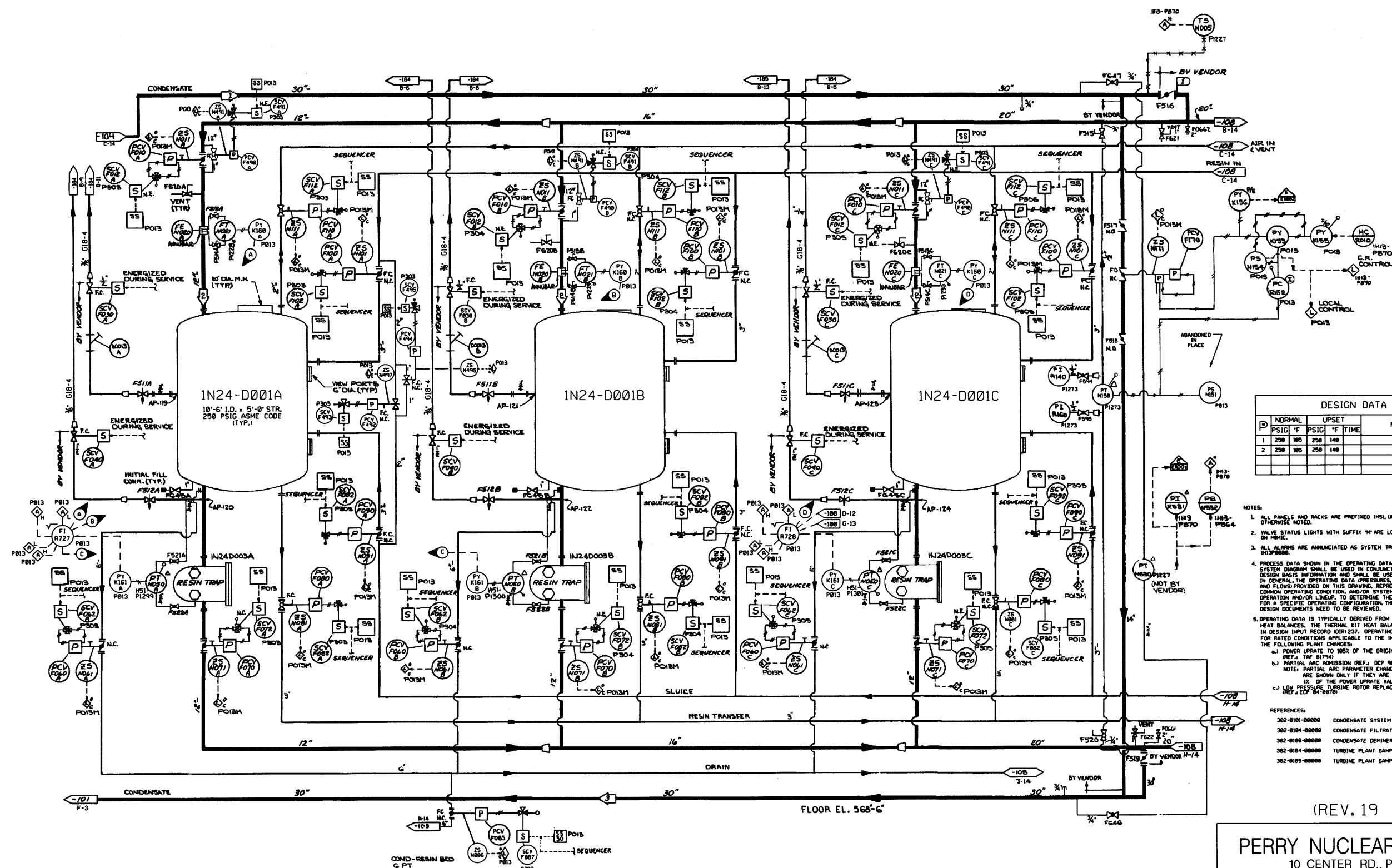
- NOTES:
- ALL PANELS & RACKS ARE PREFIXED IHSI, UNLESS OTHERWISE SPECIFIED.
 - DELETED
 - DELETED
 - DELETED
 - ALL FILTERS STAND ON FLOOR EL. 568'-6" (REF.).
 - ALL EXTERNAL PIPING EXCEPT SAMPLE TUBING IS CARBON STEEL.
 - DELETED
 - PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING, REPRESENTS THE MOST COMMON OPERATING CONDITION, AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP, TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
 - OPERATING DATA IS TYPICALLY DERIVED FROM GE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - a) POWER UPGRADE TO 105% OF THE ORIGINAL DESIGN (REF. J. TAF 81794)
 - b) PARTIAL ARC ADMISSION (REF. J. DCP 98-0050)

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CONDENSATE FILTRATION SYSTEM

FIGURE 10.1-5 (SHEET 3 OF 3)
(DWG. D-302-0106-00000)

OPERATING DATA				
SEE NOTES 4, 5				
LINE	PSIG	GPM	°F	REMARKS
1	175	22,502	181.3	
2	175	8,458	181.3	
3	110	22,502	181.3	



DESIGN DATA				
LINE	NORMAL PSIG	UPSET PSIG	NORMAL °F	UPSET °F
1	250	185	250	140
2	250	185	250	140

- NOTES:
- ALL PANELS AND RACKS ARE PREFIXED INSL UNLESS OTHERWISE NOTED.
 - VALVE STATUS LIGHTS WITH SUFFIX "A" ARE LOCATED ON INSL.
 - ALL ALARMS ARE ANNUNCIATED AS SYSTEM TROUBLE ON INSL.
 - PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING, REPRESENTS THE MOST COMMON OPERATING CONDITION AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP. TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
 - OPERATING DATA IS TYPICALLY DERIVED FROM DE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD QIRI 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - POWER UPGRADE TO 105% OF THE ORIGINAL DESIGN (REF. 104 B1740)
 - PARTIAL ARC ADMISSION REF. DCP 98-0050
 NOTE: PARTIAL ARC PARAMETER CHANGES UP & DOWN ARE SHOWN ONLY IF THEY ARE GREATER THAN 1% OF THE POWER UPGRADE VALUES.
 c) LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF. 104 B4-0070)
- REFERENCES:
- 302-0101-00000 CONDENSATE SYSTEM N21
 - 302-0104-00000 CONDENSATE FILTRATION SYSTEM N23
 - 302-0106-00000 CONDENSATE DEMINERALIZER SYSTEM N24
 - 302-0104-00000 TURBINE PLANT SAMPLING SYSTEM P33
 - 302-0105-00000 TURBINE PLANT SAMPLING SYSTEM P33

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PERRY NUCLEAR POWER PLANT
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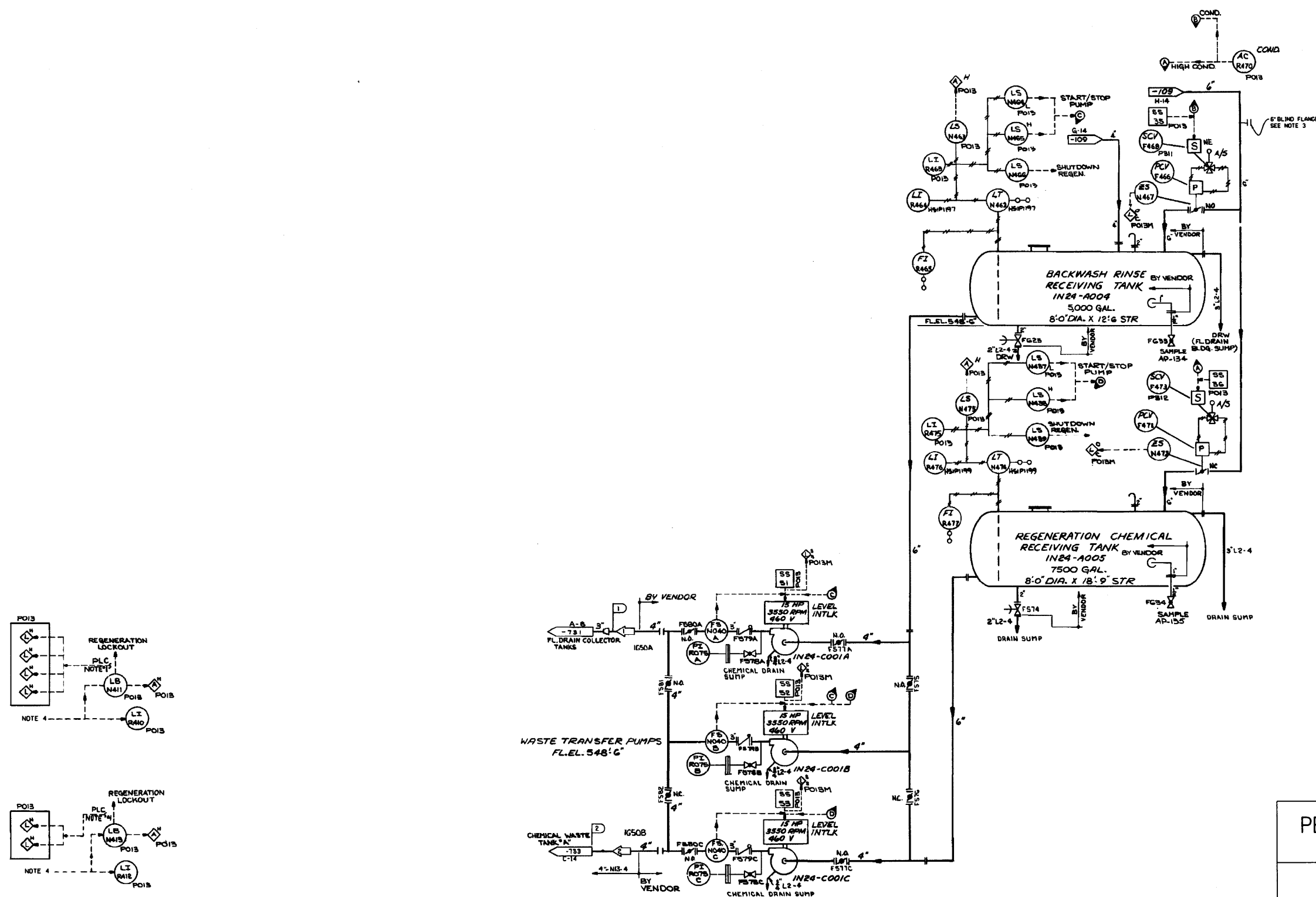
CONDENSATE
DEMINERALIZER SYSTEM
FIGURE 10.1-6 (SHEET 1 OF 4)
(DWG. D-302-0107-00000)

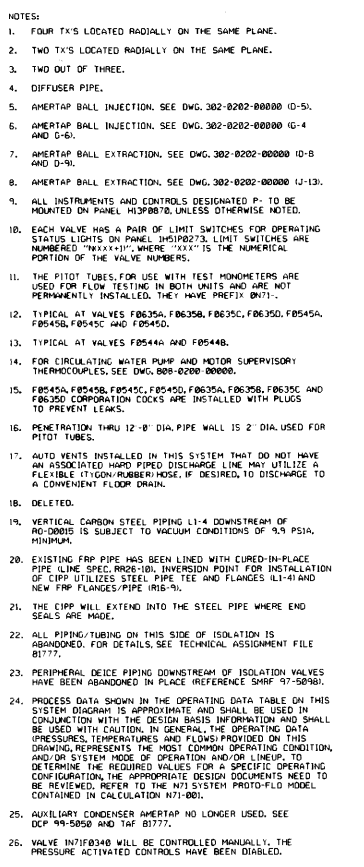
DESIGN DATA							
ID	Material	Length	Width	Height	Weight	Volume	Remarks
1	Al 6061	120	80	170	---	---	---
2	Al 6061	120	80	120	---	---	---

REFERENCE#	
302-0109-00000	CONDENSATE DEMINERALIZER SYSTEM N24
302-0731-00000	LRW - FLOOR DRAIN COLLECTOR TANKS AND WASTE COLLECTOR TANKS 050
302-0733-00000	LRW - CHEMICAL WASTE TANKS AND SPENT RESIN TRANSFER PUMPS 020

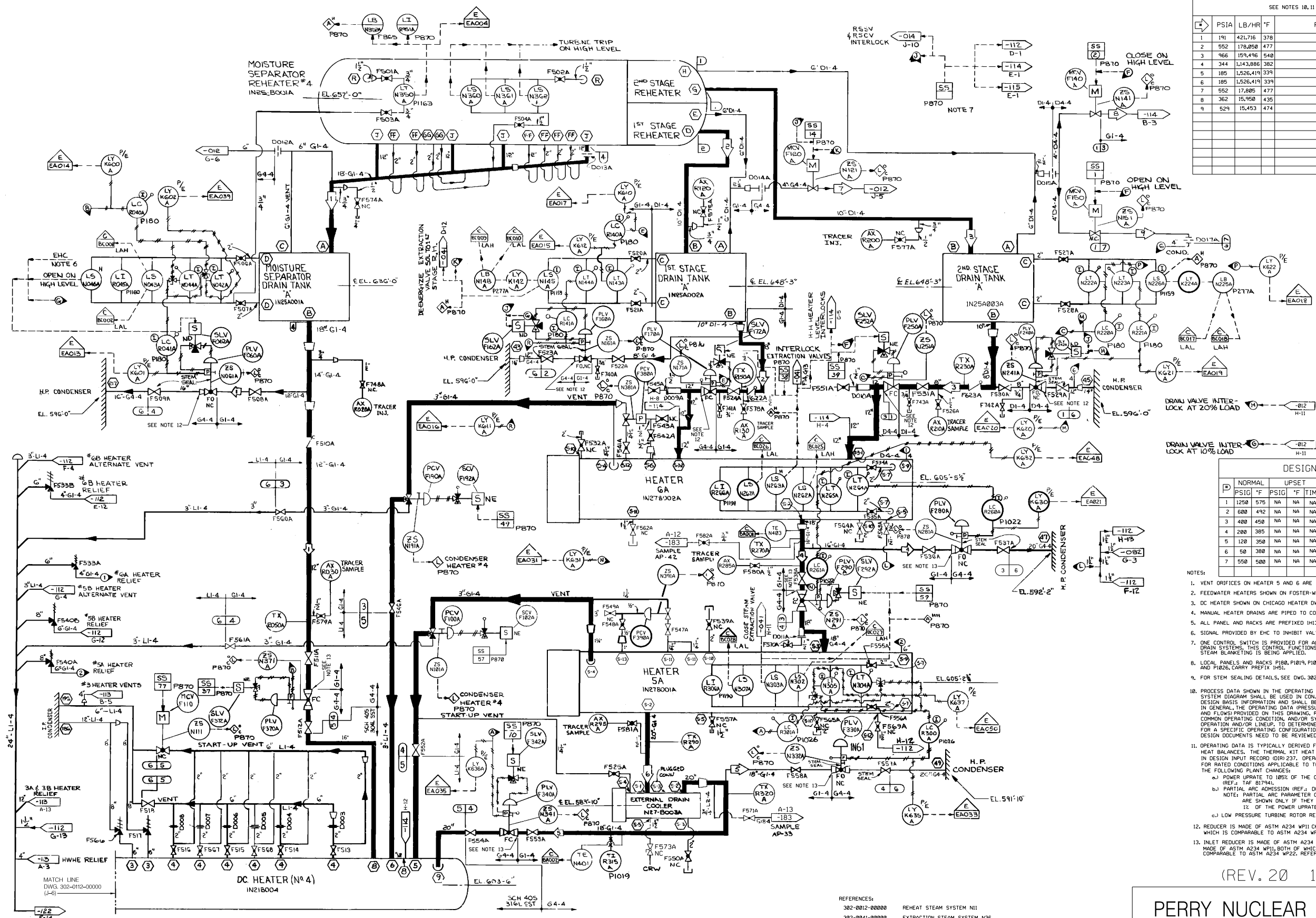
PERRY NUCLEAR POWER PLANT
10 CENTER RD., PERRY, OHIO 44081

CONDENSATE
DEMINERALIZER SYSTEM
FIGURE 10.1-6 (SHEET 4 OF 4)
(DWG. D-302-0110-00000)





CIRCULATING
WATER SYSTEM
FIGURE 10.1-7
(DWG. D-302-0201-000000)



OPERATING DATA (RATED)				
SEE NOTES 10, 11				
ID	PSIA	LB/HR	°F	REMARKS
1	191	421,716	378	
2	552	178,050	477	
3	966	159,496	540	
4	344	1,143,886	382	
5	185	1,526,419	339	
6	185	1,526,419	339	
7	552	178,050	477	
8	362	15,950	435	
9	529	15,453	474	

DESIGN DATA				
ID	NORMAL PSIG °F	UPSET PSIG °F	TIME	REMARKS
1	1250	575	NA	NA
2	600	492	NA	NA
3	400	450	NA	NA
4	280	385	NA	NA
5	120	350	NA	NA
6	50	380	NA	NA
7	550	500	NA	NA

- NOTES:
- VENT ORIFICES ON HEATER 5 AND 6 ARE INTERNAL.
 - FEEDWATER HEATERS SHOWN ON FOSTER-WHEELER DRAWINGS.
 - DC HEATER SHOWN ON CHICAGO HEATER DWG. D-3536.
 - MANUAL HEATER DRAINS ARE PIPED TO CONDENSER.
 - ALL PANEL AND RACKS ARE PREFIXED I113, UNLESS OTHERWISE NOTED.
 - SIGNAL PROVIDED BY EHC TO INHIBIT VALVES OPENING DURING PREHEATING OPERATION.
 - ONE CONTROL SWITCH IS PROVIDED FOR ALL (4) MSR REHEATER STEAM FEED AND ASSOCIATED DRAIN SYSTEMS. THIS CONTROL FUNCTIONS TO PREVENT LOSS OF BLANKETING WHEN STEAM BLANKETING IS BEING APPLIED.
 - LOCAL PANELS AND RACKS: P180, P181, P182, P159, P168, P163, P119, P110, P277A AND P182, CARRY PREFIX I113.
 - FOR STEM SEALING DETAILS, SEE DWG. 302-0151-00000.
 - PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING REPRESENTS THE MOST COMMON OPERATING CONDITION, AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP. TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
 - OPERATING DATA IS TYPICALLY DERIVED FROM GE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - POWER UPRATE TO 105% OF THE ORIGINAL DESIGN (REF.: TAF 81794).
 - PARTIAL ARC ADMISION (REF.: DCP 98-0050) NOTE: PARTIAL ARC PARAMETER CHANGES (UP & DOWN) ARE SHOWN ONLY IF THEY ARE GREATER THAN 1% OF THE POWER UPRATE VALUES.
 - LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF.: ECP 04-0070).
 - REDUCER IS MADE OF ASTM A234 WP11 CHROME-NIOBYL MATERIAL WHICH IS COMPARABLE TO ASTM A234 WP22. REFERENCE ECP 13-0591-001.
 - INLET REDUCER IS MADE OF ASTM A234 WPB & OUTLET REDUCER IS MADE OF ASTM A234 WP11, BOTH OF WHICH ARE CHROME-NIOBYL MATERIAL COMPARABLE TO ASTM A234 WP22. REFERENCE ECP 13-0591-001.

- REFERENCES:
- 302-0012-00000 REHEAT STEAM SYSTEM N11
 - 302-0041-00000 EXTRACTION STEAM SYSTEM N36
 - 302-0112-00000 HIGH PRESSURE HEATER DRAINS AND VENTS 'B' SYSTEM N25
 - 302-0113-00000 LOW PRESSURE HEATER DRAINS AND VENTS SYSTEM N26
 - 302-0114-00000 HIGH PRESSURE HEATER DRAINS AND VENTS 'A' SYSTEM N25
 - 302-0122-00000 MAIN, REHEAT, EXTRACTION, AND MISCELLANEOUS DRAINS SYSTEM N22
 - 302-0183-00000 TURBINE PLANT SAMPLING SYSTEM P33
 - 302-0007-00000 REACTOR - TURBINE GENERATOR TRIP DIAGRAM
 - 302-0151-00000 CONDENSATE SEAL SYSTEM P12
 - 302-0014-00000 REHEATER HEATING STEAM SYSTEM N11
 - 302-0115-00000 HIGH PRESSURE HEATER DRAINS AND VENTS 'B' SYSTEM N25
 - 302-0082-00000 FEEDWATER SYSTEM N27

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HIGH PRESSURE HEATER DRAINS AND VENTS
FIGURE 10.1-8 (SHEET 1 OF 4)
(DWG. D-302-0111-00000)

OPERATING DATA (RATED)			
SEE NOTES 8, 9			
#	PSIA	LB/HR	'F
1	191	421,716	378
2	552	178,858	477
3	966	159,496	540
4	344	1,143,886	382
5	185	1,526,419	339
6	185	1,526,419	339
7	552	17,805	477
8	363	15,950	435
9	529	15,453	474

DESIGN DATA			
#	NORMAL	UPSET	REMARKS
PSIG	'F	PSIG	'F TIME
1	1250	575	NA NA NA
2	600	492	NA NA NA
3	400	450	NA NA NA
4	200	385	NA NA NA
5	120	350	NA NA NA
6	50	380	NA NA NA
7	550	500	NA NA NA

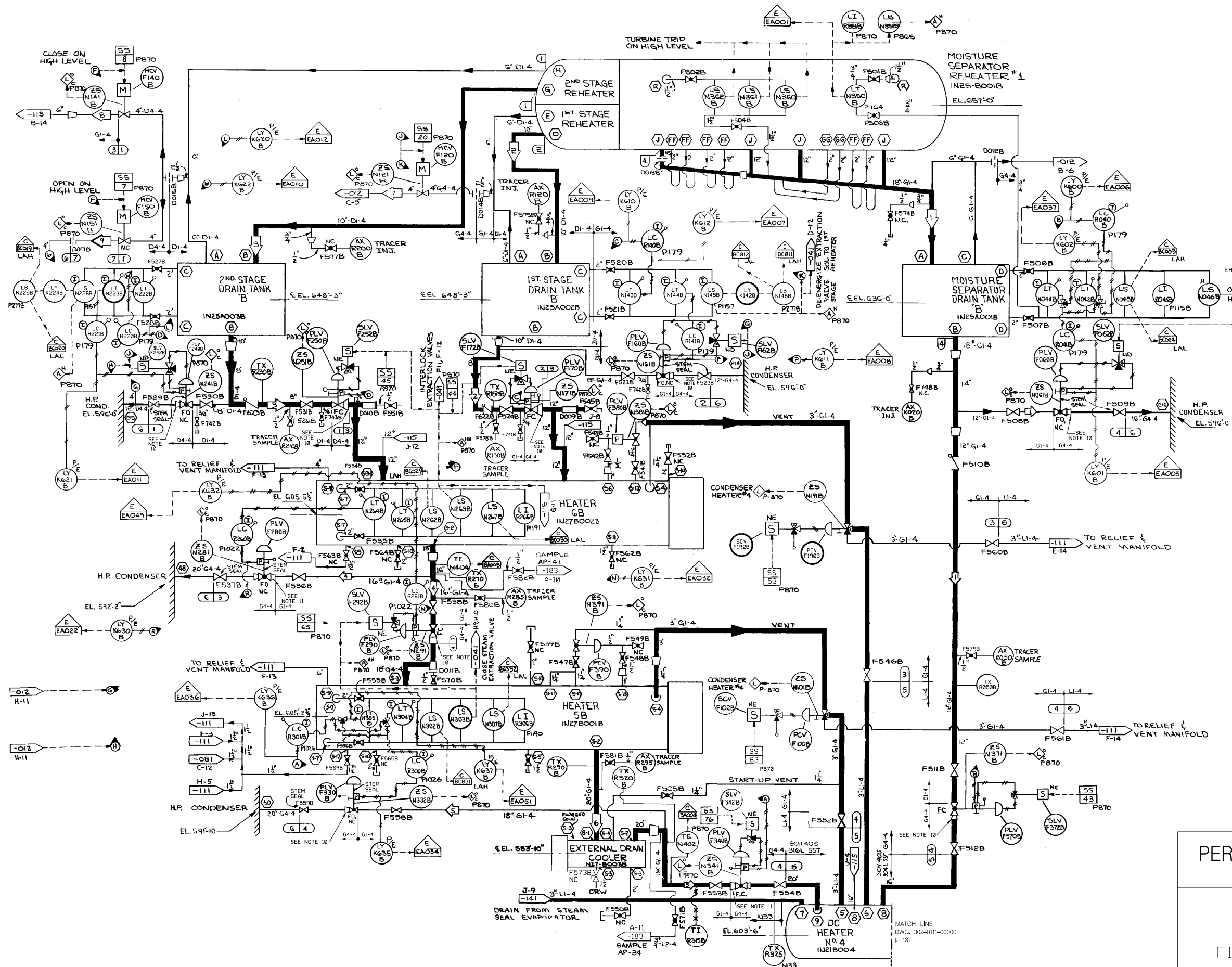
- NOTES:
- VENT ORIFICES ON HEATERS 5 AND 6 ARE INTERNAL.
 - FEEDWATER HEATERS SHOWN ON FOSTER-WHEELER DRAWINGS.
 - DC HEATER SHOWN ON CHICAGO HEATER DWG. D-3536.
 - MANUAL HEATER DRAINS ARE PIPED TO CONDENSER.
 - ALL PANEL AND RACKS ARE PREFIXED IHI3, UNLESS OTHERWISE NOTED.
 - LOCAL PANELS AND RACKS P1164, P1157, P1158, P1180, P179 P1019, P1022, P2778 AND P1026 CARRY PREFIX IHI3.
 - FOR STEM SEALING DETAILS, SEE DWG. 302-0151-000000.
 - PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING, REPRESENTS THE MOST COMMON OPERATING CONDITION, AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP, TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
 - OPERATING DATA IS TYPICALLY DERIVED FROM GE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - POWER UPGRADE TO 105% OF THE ORIGINAL DESIGN (REF: TAF 81794).
 - PARTIAL ARC ADMISSION (REF: DCP 98-0050).
 NOTE: PARTIAL ARC PARAMETER CHANGES UP & DOWN ARE SHOWN ONLY IF THEY ARE GREATER THAN 1% OF THE POWER UPGRADE VALUES.
 - LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF: ECP 04-0070).
 - REDUCER IS MADE OF ASTM A234 WP11 CHROME-MOLY MATERIAL WHICH IS COMPARABLE TO ASTM A234 WP22 REFERENCE ECP 13-0591-001.
 - INLET REDUCER IS MADE OF ASTM A234 WPB & OUTLET REDUCER IS MADE OF ASTM A234 WP11, BOTH OF WHICH ARE CHROME-MOLY MATERIAL COMPARABLE TO ASTM A234 WP22, REFERENCE ECP 13-0591-001.

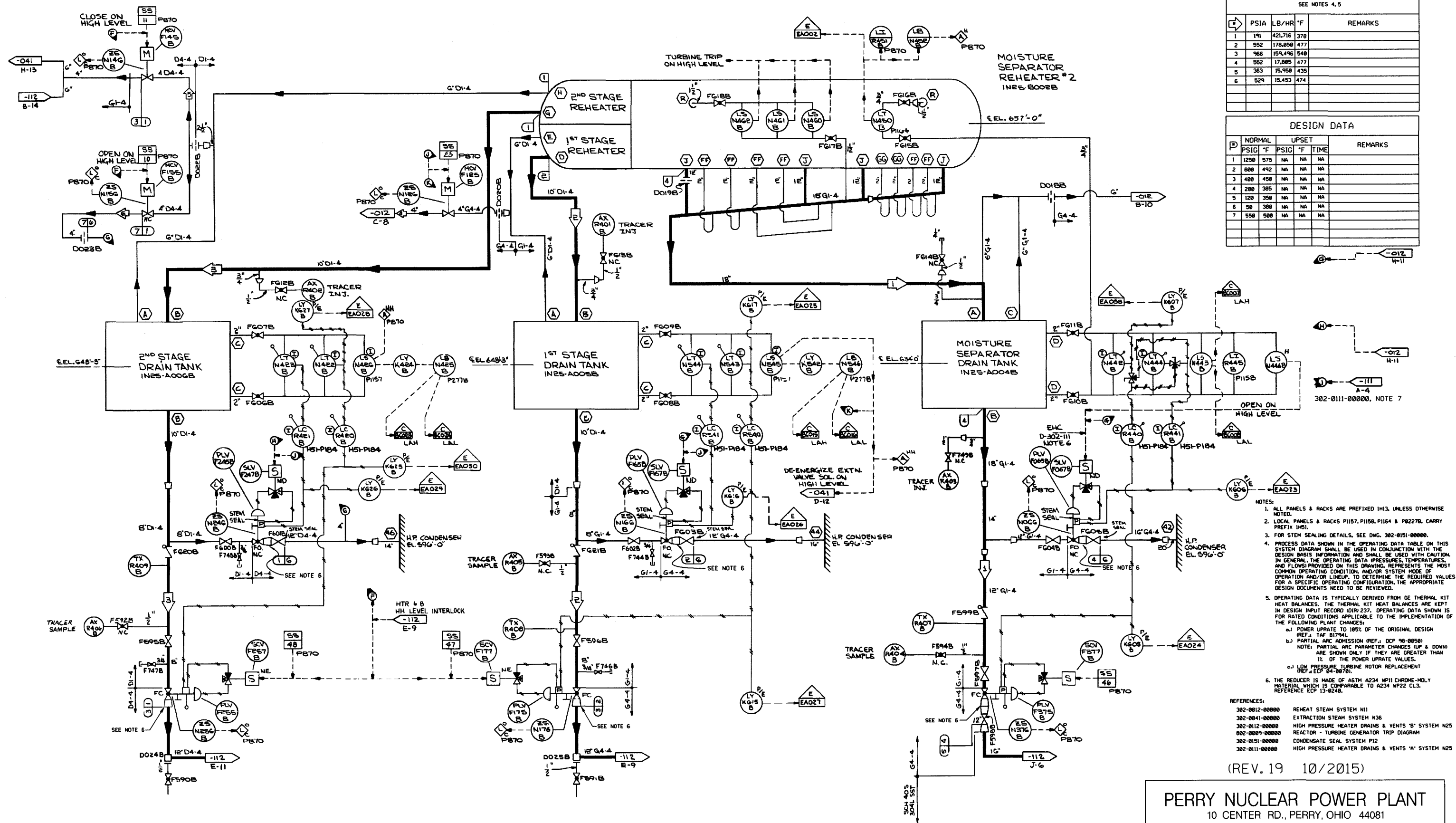
- REFERENCES:
- 302-0012-00000 REHEAT STEAM SYSTEM N11
 - 302-0111-00000 HIGH PRESSURE HEATER DRAINS AND VENTS 'A' SYSTEM N25
 - 302-0115-00000 HIGH PRESSURE HEATER DRAINS AND VENTS 'B' SYSTEM N25
 - 302-0141-00000 STEAM SEAL SYSTEM N33
 - 302-0182-00000 TURBINE PLANT SAMPLING SYSTEM P33
 - 302-0183-00000 TURBINE PLANT SAMPLING SYSTEM P33
 - 302-0009-00000 REACTOR - TURBINE GENERATOR TRIP DIAGRAM
 - 302-0151-00000 CONDENSATE SEAL SYSTEM P12
 - 302-0081-00000 FEEDWATER SYSTEM N27
 - 302-0041-00000 EXTRACTION STEAM SYSTEM N36

(REV. 20 10/2017)

PERRY NUCLEAR POWER PLANT
 10 CENTER RD., PERRY, OHIO 44081

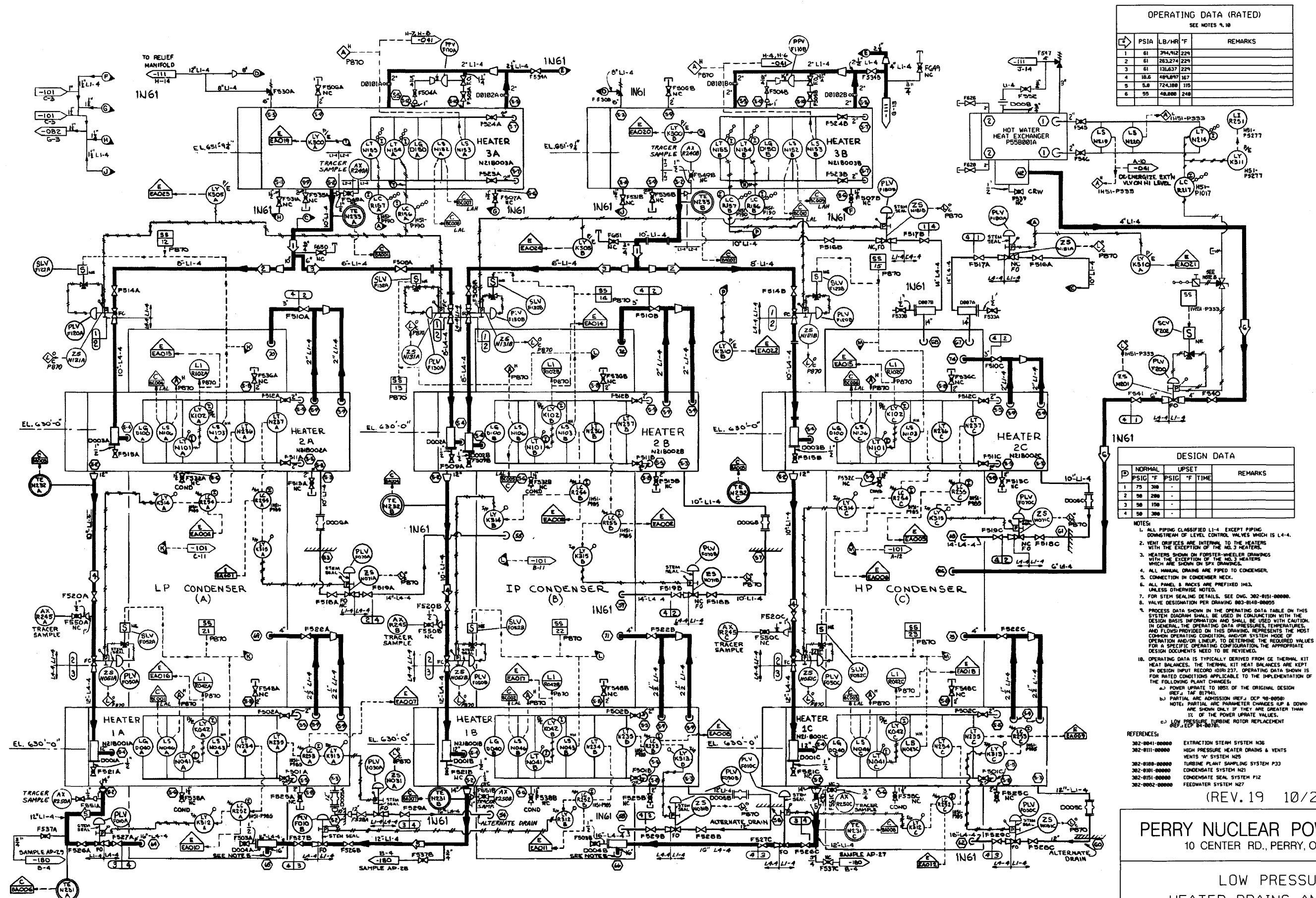
**HIGH PRESSURE HEATER
 DRAINS AND VENTS**
 FIGURE 10.1-8 (SHEET 2 OF 4)
 (DWG. D-302-0112-000000)





PERRY NUCLEAR POWER PLANT
10 CENTER RD., PERRY, OHIO 44081

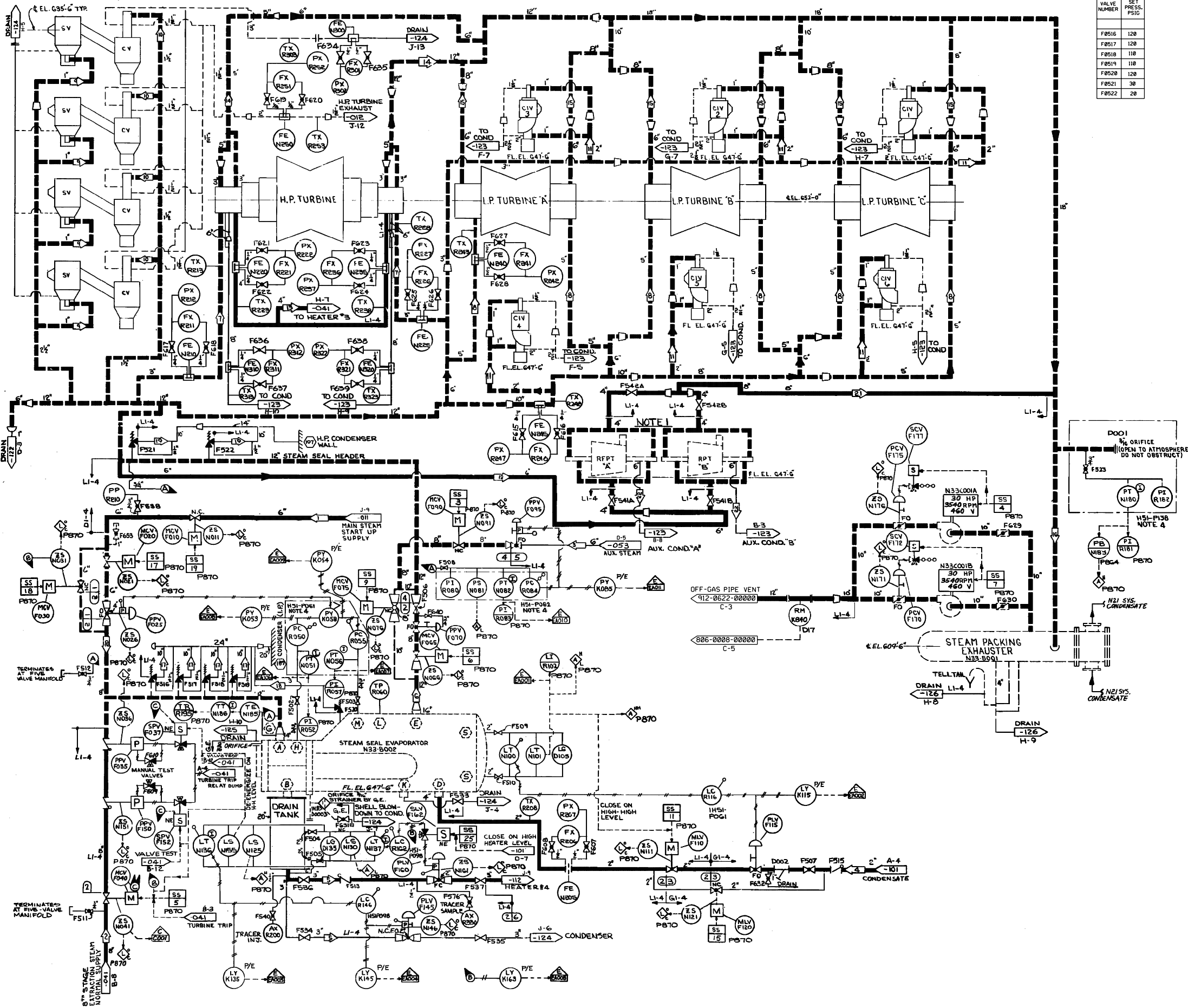
**HIGH PRESSURE HEATER
DRAINS AND VENTS**
FIGURE 10.1-8 (SHEET 4 OF 4)
(DWG. D-302-0115-00000)




(REV. 19 10/2015)

PERRY NUCLEAR POWER PLANT
10 CENTER RD., PERRY, OHIO 44081

**LOW PRESSURE
HEATER DRAINS AND VENTS**
FIGURE 10.1-9
(DWG. D-302-0113-00000)



RELIEF VALVE SET PRESS. VALVE NUMBER	SET PRESS. PSIG
F0516	120
F0517	120
F0518	110
F0519	110
F0520	120
F0521	30
F0522	20

OPERATING DATA					
SEE NOTES 8, 9					
	PSIG	LB/HR	°F	REMARKS	
	1	950	30,100	540	START UP
	2	95	25,400	420	50,700 MAX.
	3	90	25,000	331	45,000 MAX.
	4	60-400	25,000	216	45,000 MAX.
5	67	130 GPM	313		START-UP (MAX.)
	33	65 GPM	278		START-UP (NORM.)
	82	110 GPM	326		FULL-LOAD (MAX.)
	83	60 GPM	327		FULL-LOAD (NORM.)
6	10-60	25,000	300		45,000 MAX.
7	4		1170	260	
8	4		2940	260	
9	4		290	260	
10	4		50	260	
11	4		75	260	
12	4		810	260	MAX. 1620 LB/HR
13	100	8,150	380		39,300 MAX.
14	5" H ₂ O VAC	550	200		PLUS 190 LB/HR AIR
15	5" H ₂ O VAC	1110	200		PLUS 390 LB/HR AIR
16	10" H ₂ O VAC	7750	200		PLUS 2720 LB/HR AIR
17	65	185,000	355		RELIEF VALVE
18	10	190,000	-		380 GPM RELIEF VALVE SP. GR. 1.1
19	10	52,000	270		RELIEF VALVE
20	50	30,100			
21	5" H ₂ O VAC	355	200		PLUS 130 LB/HR AIR MAX. 710 LB/HR STM. & 260 LB/HR AIR
22	5" H ₂ O VAC	747	260		1490 LB/HR MAX.

DESIGN DATA					
D	NORMAL		UPSET		REMARKS
	PSIG	F	PSIG	F TIME	
1	1250	575			
2	150	450			
3	600	320			
4	25	450			
5	195	386			
6	120	350			

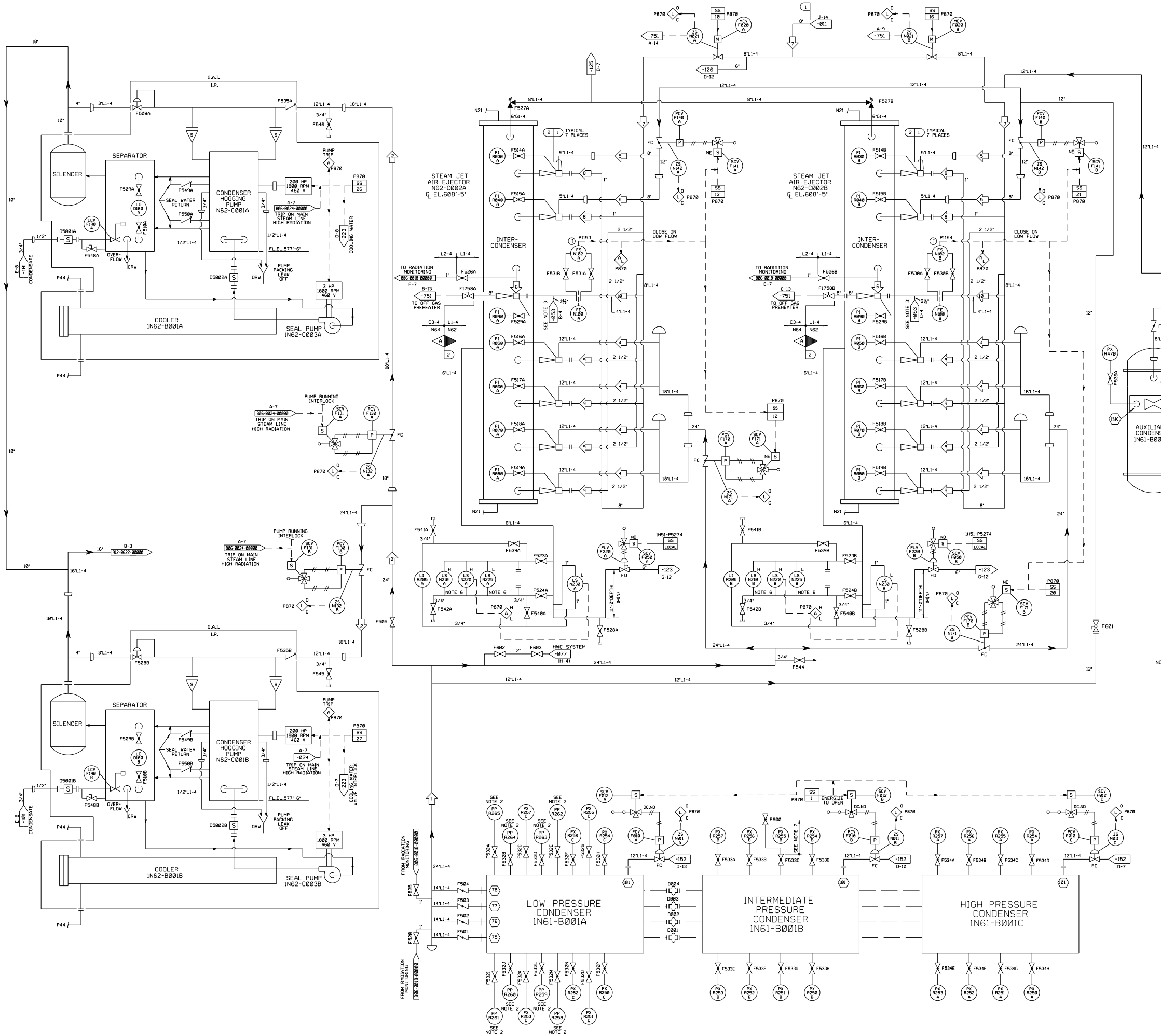
- NOTES:
- OUTLINE OF RPPT (PURCHASE CONNECTIONS) ON G.E. DWG. 5004190C.
 - STEAM SEAL EVAPORATOR SHOWN ON G.E. DWG. 1160411.
 - STEAM PACKING EXHAUSTER SHOWN ON G.E. DWG. 1610476L.
 - INSTRUMENT INCLUDED WITHIN BOUNDARY ARE LOCATED ON THE PANEL INDICATED.
 - ALL PANEL NUMBERS ARE PREFIXED BY 1H13, UNLESS OTHERWISE NOTED.
 - FORWARD-REVERSE TUBE REPRESENTED BY SYMBOLS. ROOT VALVES BY G.E.T.
 - G.E.T. DOES NOT PROVIDE TEST THERMOWELLS IN THEIR PORTION OF THE STEAM SEAL PIPING. STRIP COUPLES ARE TO BE SUPPLIED BY CEI FOR THE FOLLOWING TEMPERATURE TEST POINTS: R213, R228, R243, R248, R253, AND R303.
 - PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING, REPRESENTS THE MOST COMMON OPERATING CONDITION, AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP, TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
 - OPERATING DATA IS TYPICALLY DERIVED FROM GE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - POWER UPGRADE TO 105% OF THE ORIGINAL DESIGN (REF. TAF 81794L).
 - PARTIAL ARC ADMISSION (REF. DCP 98-0050) NOTE: PARTIAL ARC PARAMETER CHANGES (UP & DOWN) ARE SHOWN ONLY IF THEY ARE GREATER THAN 1% OF THE POWER UPGRADE VALUES.
 - LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF. ECP 84-00780).
- REFERENCES:
- 302-0011-000000 MAIN STEAM SYSTEM N11
 - 302-0041-000000 EXTRACTOR STEAM SYSTEM N36
 - 302-0101-000000 CONDENSATE SYSTEM N21
 - 302-0112-000000 HIGH PRESSURE HEATER DRAINS AND VENTS "B" SYSTEM N25
 - 302-0122-000000 MAIN, REHEAT, EXTRACTION AND MISCELLANEOUS DRAINS SYSTEM N22
 - 302-0123-000000 MAIN, REHEAT, EXTRACTION AND MISCELLANEOUS DRAINS SYSTEM N22
 - 302-0124-000000 MAIN, REHEAT, EXTRACTION AND MISCELLANEOUS DRAINS SYSTEM N22
 - 302-0125-000000 MAIN, REHEAT, EXTRACTION AND MISCELLANEOUS DRAINS SYSTEM N22
 - 412-0622-000000 OFF-GAS BUILDING EXHAUST SYSTEM N06
 - 606-0000-000000 PLANT RADIATION MONITORING SYSTEM (D7)
 - 12503148 ELEMENTARY DIAGRAM TRIP AND MONITORING SYSTEM (G.E.)
 - 834E202 DIAGRAM OF STEAM SEAL SYSTEM (G.E.)
 - 302-0126-000000 MAIN, REHEAT, EXTRACTION AND MISCELLANEOUS DRAINS SYSTEM N22
 - 302-0053-000000 AUXILIARY STEAM SYSTEM P61
 - 302-0012-000000 REHEAT STEAM SYSTEM N11


(Rev. 18 10/13)

PERRY NUCLEAR POWER PLANT
10 CENTER RD., PERRY, OHIO 44081

STEAM SEAL SYSTEM

FIGURE 10.1-10
(DWG. D-302-0141-00000)



OPERATING DATA					
SEE NOTES 8, 9					
		IN, HGA	°F	#/HR	REMARKS
AIR	1	2	100	3100	AIR AND VAPOR
	2	3.0	75	2500	ACFM
	3	2	100	260	AIR AND VAPOR
	4	2	100	775	AIR AND VAPOR
	5	2	100	130	AIR AND VAPOR
	6	8	228	654	AIR AND VAPOR
STEAM		PSIa			
	7	140	353	24,377	STEAM
	8	140	353	408	STEAM
	9	140	353	3509	STEAM
	10	140	353	9525	STEAM

DESIGN DATA						
#	NORMAL		UPSET		TIME	REMARKS
	PSIG	°F	PSIG	°F		
1	150	353	150	353		
2	15	353				

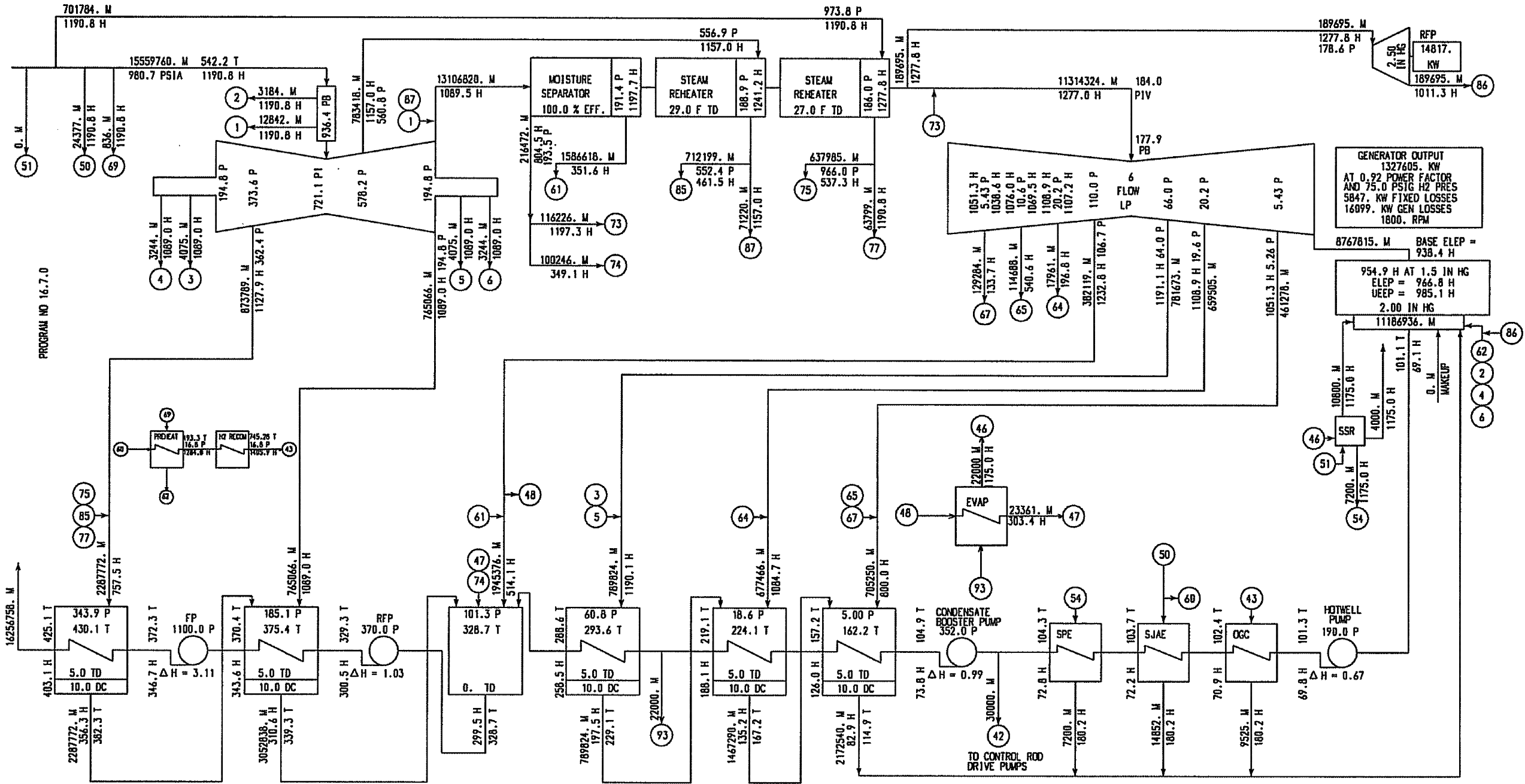
- REFERENCES:
- 302-0011-00000 MAIN STEAM SYSTEM, N11
 - 302-0053-00000 AUXILIARY STEAM, P61
 - 302-0101-00000 CONDENSATE SYSTEM, N21
 - 302-0123-00000 M.R.E. AND MISCELLANEOUS DRAINS SYSTEM, N22
 - 302-0125-00000 M.R.E. AND MISCELLANEOUS DRAINS SYSTEM, N22
 - 302-0126-00000 M.R.E. AND MISCELLANEOUS DRAINS SYSTEM, N22
 - 302-0152-00000 CONDENSATE SEAL SYSTEM, P12
 - 302-0222-00000 TURBINE BLOC, CLOSED COOLING SYSTEM, P44
 - 302-0751-00000 OFF-GAS LOW TEMPERATURE SYSTEM, N64
 - 006-0010-00000 OFF-GAS PRETREATMENT RADIATION MONITORS
 - 006-0024-00000 PLANT RADIATION MONITORING SYSTEM
 - 912-0622-00000 OFF-GAS BUILDING EXHAUST AND WATER TREATMENT BUILDING VENTILATION SYSTEMS, M36 & M37
 - 001E555 PERFORMANCE TEST PIPING, HOODS A AND B
 - 003E401 PERFORMANCE TEST PIPING, HOOD C
- NOTES:
- ALL PANELS AND RACKS CARRY PREFIX IH13, UNLESS OTHERWISE NOTED.
 - BASKET TIPS SUPPLIED BY G.E.T. NOT TO BE CONNECTED FOR ASME TEST.
 - TEST CONNECTION PERMANENTLY PIPED.
 - NO IMPACT TESTS ARE REQUIRED FOR PIPING (C3-4) BETWEEN SJAE AND RECOMBINERS.
 - THE SYMBOL DESIGNATES THOSE NON-SAFETY AREAS OF THE SYSTEM WHERE THE AUGMENTED QUALITY ASSURANCE PROGRAM REQUIREMENTS DEFINED IN SP-45 APPLY.
 - LEVEL SWITCHES N210A & B AND N225A & B ARE ABANDONED IN PLACE.
 - TUBING UPSTREAM OF 1N62F0533C IS LINEAR LOW DENSITY POLYETHYLENE. 1N62F0600 IS A NON-CALIBRATED VALVED FLOW METER. PRESSURE TEST POINT LOCATION PX-R0255B IS BEING UTILIZED AS THE TRACER GAS "TEST SHOT" INJECTION POINT FOR CONDENSER IN-LEAKAGE TESTING ACTIVITIES.
 - PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING, REPRESENTS THE MOST COMMON OPERATING CONDITION, AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.
 - OPERATING DATA IS TYPICALLY DERIVED FROM GE THERMAL KIT HEAT BALANCES. THE THERMAL KIT HEAT BALANCES ARE KEPT IN DESIGN INPUT RECORD (DIR) 237. OPERATING DATA SHOWN IS FOR RATED CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF THE FOLLOWING PLANT CHANGES:
 - a.) POWER UPGRADE TO 105% OF THE ORIGINAL DESIGN (REF: TAF 81794).
 - b.) PARTIAL ARC ADMISSION (REF: DCP 98-0050)
 - NOTE: PARTIAL ARC PARAMETER CHANGES UP & DOWN ARE SHOWN ONLY IF THEY ARE GREATER THAN 1% OF THE POWER UPGRADE VALUES.
 - c.) LOW PRESSURE TURBINE ROTOR REPLACEMENT (REF: ECP 04-0070).

(REV. 20 10/2017)

PERRY NUCLEAR POWER PLANT
10 CENTER RD., PERRY, OHIO 44081

CONDENSER AIR
REMOVAL SYSTEM
FIGURE 10.1-11
(DWG. D-302-0131-00000)

THE VALUE OF GENERATOR OUTPUT SHOWN ON THIS HEAT BALANCE IS AFTER ALL POWER FOR EXCITATION AND OTHER TURBINE-GENERATOR AUXILIARIES HAS BEEN DEDUCTED



VALVE BEST POINT
NET HEAT RATE = $\frac{15554973. (1190.8 - 403.1) + 701784. (1190.8 - 403.1) + 30000. (1190.8 - 72.8)}{1327605.} = 9670 \frac{\text{BTU}}{\text{KW-HR}}$

FENOC - Perry Unit 1
Turbine No. 170X655
LP Monoblock Upgrade
New 43" LSB Design
Rated Thermal Power
(NSSS = 3762.5 MWth)

LEGEND - CALCULATIONS BASED
ON 1967 ASME STEAM TABLES
M - FLOW-LB/HR
P - PRESSURE-PSIA
H - ENTHALPY-BTU/LB
T - TEMPERATURE-F DEGREES

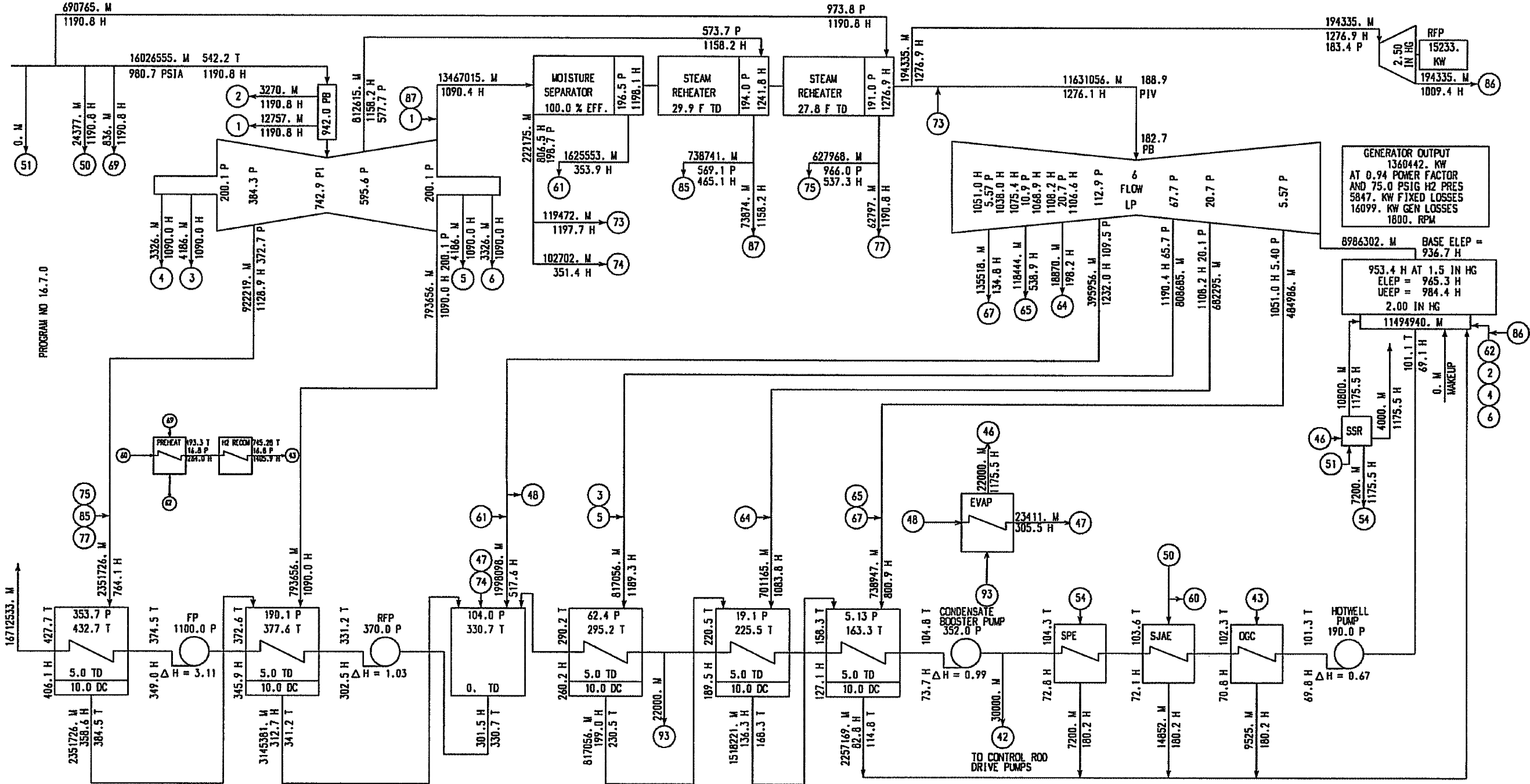
1327605. KW 2.00 IN HG ABS 0. PCT MU
TC&F 43.0 IN LSB 1800 RPM
980.7 PSIA 1190.8 BTU / LB TWO STAGE REHEAT
GEN- 1446700. KVA 0.90 PF L10 75.0 PSIG H2 PRES

(Rev. 18 10/13)

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TURBINE AND EXTRACTION ARRANGEMENT IS SCHEMATIC ONLY
CALCULATED DATA - NOT GUARANTEED

THE VALUE OF GENERATOR OUTPUT SHOWN ON THIS HEAT BALANCE IS AFTER ALL POWER FOR EXCITATION AND OTHER TURBINE-GENERATOR AUXILIARIES HAS BEEN DEDUCTED



VALVE BEST POINT
NET HEAT RATE = $\frac{16021768. (1190.8 - 406.1) + 690765. (1190.8 - 406.1) + 30000. (1190.8 - 72.8)}{1360442.} = 9665 \frac{\text{BTU}}{\text{KW-HR}}$

FENOC - Perry Unit 1
Turbine No. 170X655
LP Monoblock Upgrade
New 43" LSB Design
VWO Flow Condition
(3% Flow Margin Assumption)

LEGEND - CALCULATIONS BASED
ON 1967 ASME STEAM TABLES
M - FLOW-LB/HR
P - PRESSURE-PSIA
H - ENTHALPY-BTU/LB
T - TEMPERATURE-F DEGREES

1327605. KW 2.00 IN HG ABS 0. PCT MU
TC4F 43.0 IN LSB 1800 RPM
980.7 PSIA 1190.8 BTU / LB TWO STAGE REHEAT
GEN- 1446700. KVA 0.90 PF L10 75.0 PSIG H2 PRES

(Rev. 18 10/13)

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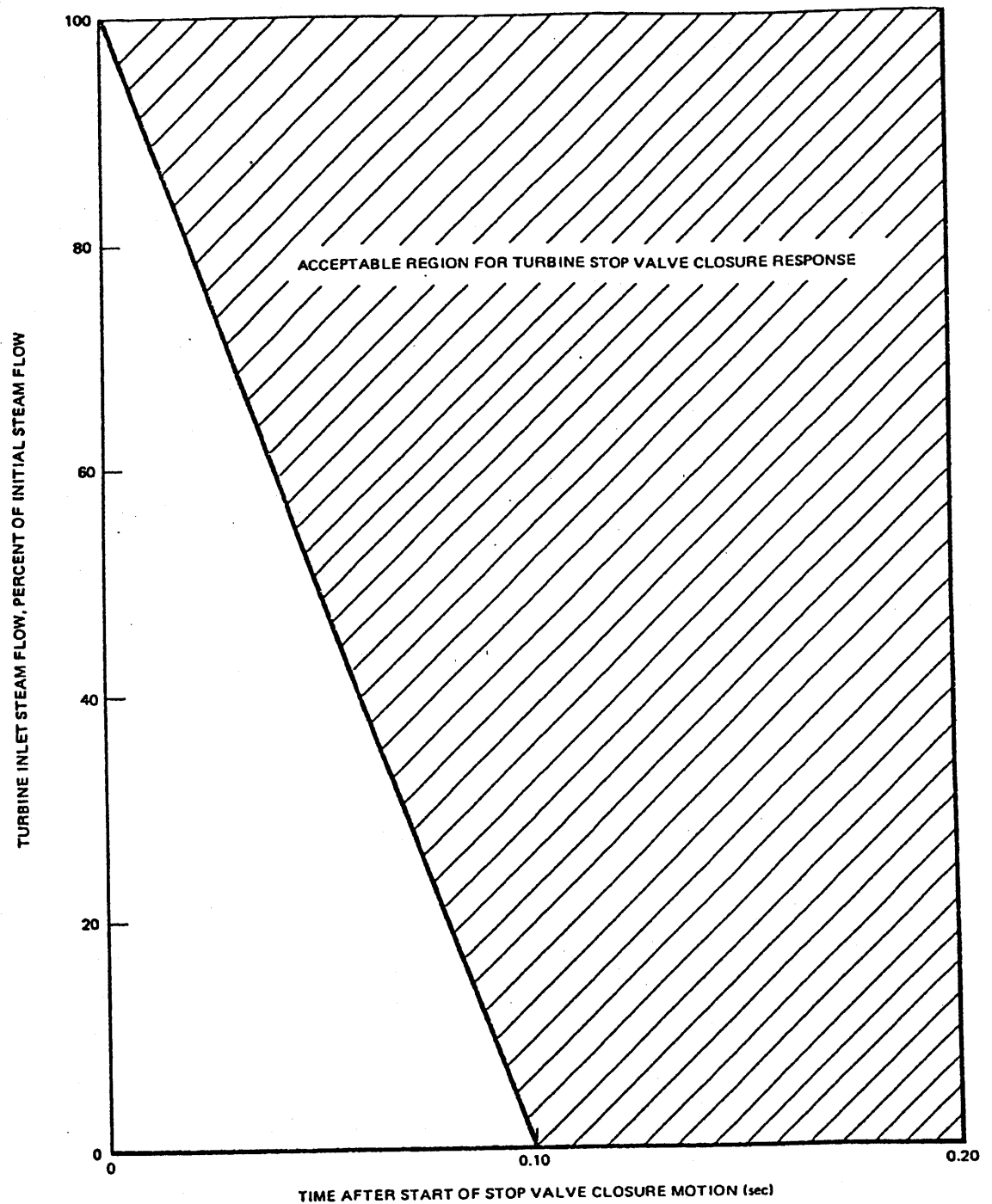
1LX0537-01 Rev. 1

01/12/12

PERRY NUCLEAR POWER PLANT
10 CENTER RD., PERRY, OHIO 44081

DESIGNED POWER - VWO

FIGURE 10.1-13



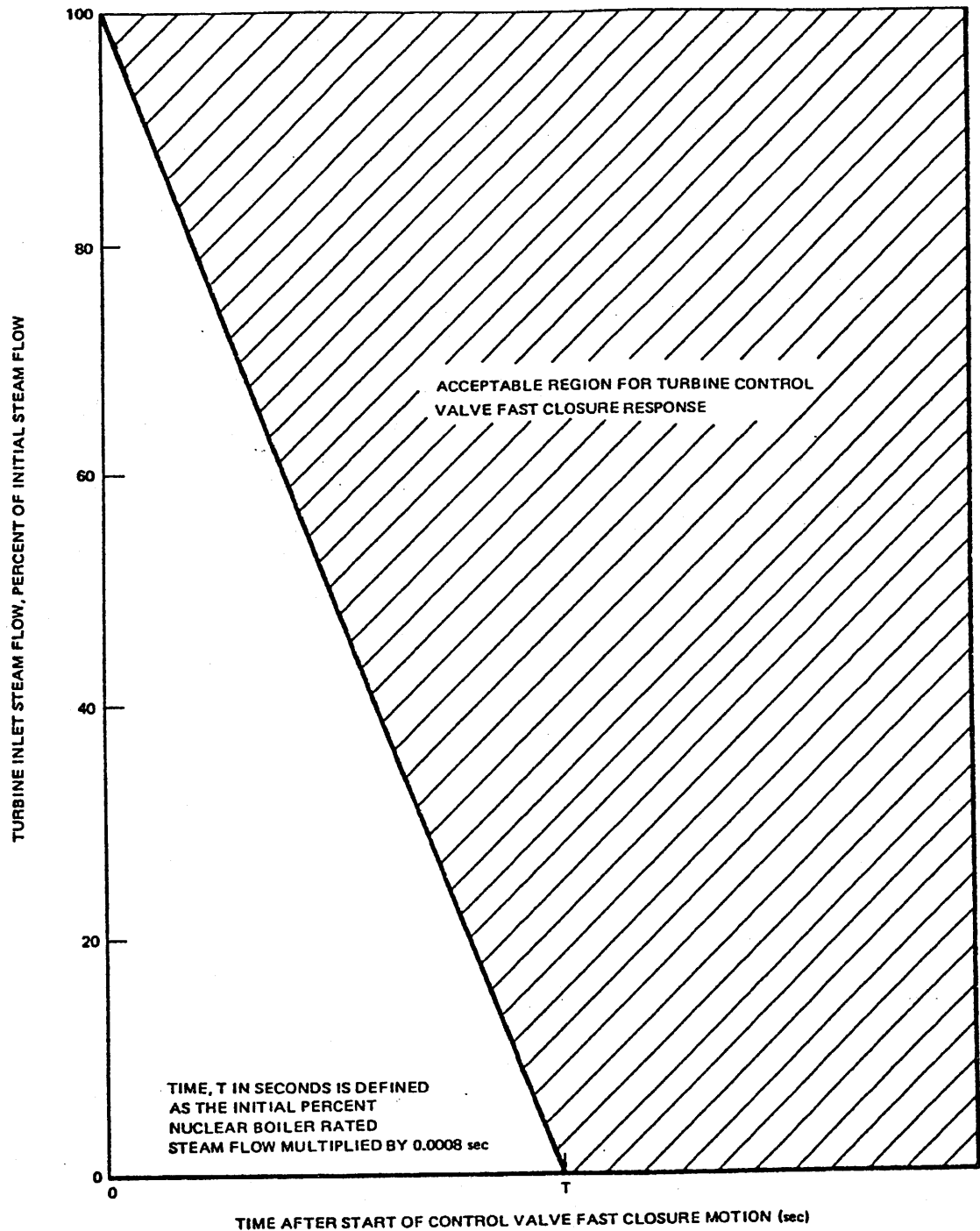
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Turbine Stop Valve
Closure Characteristics

Figure 10.2-1



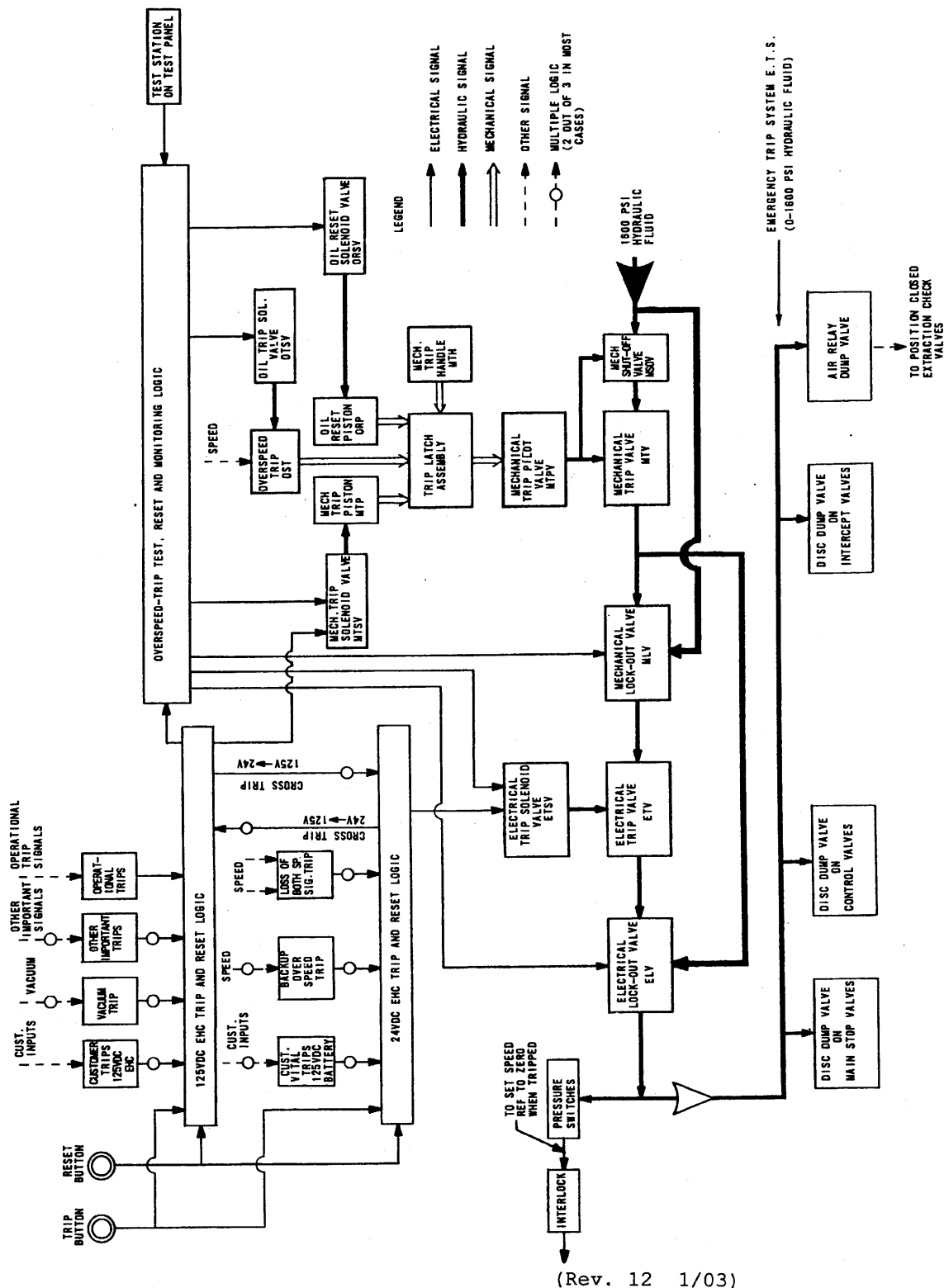
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Turbine Control Valve Fast
Closure Characteristics

Figure 10.2-2



(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Turbine Protection System
Block Diagram

Figure 10.2-3

RELIEF VALVE SET PRESSURE	
VALVE N°	P.S.I.G.
RUPTURE DISC	3675
F503A AND F503B	2450
F512A & F512B	120
F516	120

NOTES:

1. MAXIMUM FLOW DURING GENERATOR FILLING OPERATION IS 175 SCFH. THE FLOW DURING NORMAL OPERATION IS 800 SCFH PER DAY MAXIMUM (8.42 SCFH).
2. ALL PANELS CARRY PREFIX 1H51- UNLESS OTHERWISE NOTED.
3. CAPACITY OF EACH STORAGE TANK 8000 SCF OF HYDROGEN AT 2300 PSIG (3:1 RATIO).
4. PPV-F500 IS AN EXCESSIVE FLOW CHECK VALVE DESIGNED TO STOP FLOW WHEN IT EXCEEDS 87 SCFH (3120 SCFH).
5. HYDROGEN PIPING WILL NOT BE ROUTED THROUGH AREAS CONTAINING SAFETY-RELATED EQUIPMENT.
6. PROCESS DATA SHOWN IN THE OPERATING DATA TABLE ON THIS SYSTEM DIAGRAM SHALL BE USED IN CONJUNCTION WITH THE DESIGN BASIS INFORMATION AND SHALL BE USED WITH CAUTION. IN GENERAL, THE OPERATING DATA (PRESSURES, TEMPERATURES, AND FLOWS) PROVIDED ON THIS DRAWING REPRESENTS THE MOST COMMON OPERATING CONDITION AND/OR SYSTEM MODE OF OPERATION AND/OR LINEUP. TO DETERMINE THE REQUIRED VALUES FOR A SPECIFIC OPERATING CONFIGURATION, THE APPROPRIATE DESIGN DOCUMENTS NEED TO BE REVIEWED.

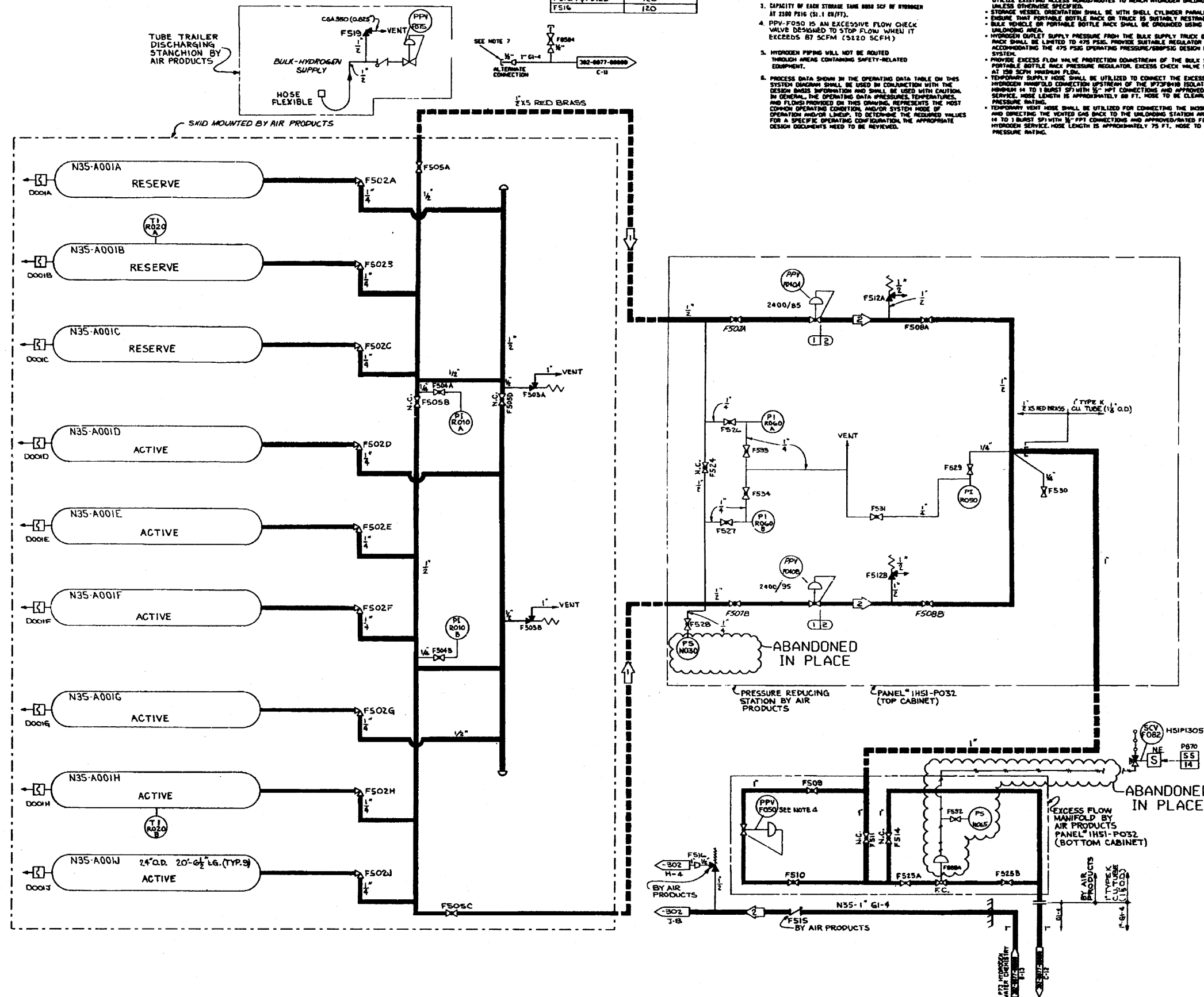
7. ALTERNATE HYDROGEN CONNECTION BY OTHERS REQUIREMENTS ARE AS FOLLOWS:

- STORAGE VESSEL SHALL BE LIMITED TO 62.42 SCFH.
- STORAGE PRESSURE SHALL BE LIMITED TO 2300 PSIG.
- HYDROGEN VESSEL CAPACITY SHALL BE LIMITED TO 2,387 SCF.
- STORAGE LOCATION SHALL BE 50 FT. NORTH OF TEMPORARY TIE-IN CONNECTION POINT AT HEATER BAY SURROUNDING STRUCTURE. CURRENT HYDROGEN SEPARATION DISTANCES SHALL BE MAINTAINED.
- UTILIZE EXISTING ACCESS ROADS/ROUTES TO REACH HYDROGEN UNLOADING AREA, UNLESS OTHERWISE SPECIFIED.
- STORAGE VESSEL ORIENTATION SHALL BE WITH SHOCK CYLINDER PARALLEL WITH N. TURBINE BLDG. WALL.
- ENSURE THAT PORTABLE BOTTLE RACK OR TRUCK IS SUSTAINABLY RESTRAINED TO REMAIN AGAINST DAMAGING WINDS.
- BULK VEHICLE OR PORTABLE BOTTLE RACK SHALL BE GROUNDING USING EXISTING GROUNDING CLAMP IN UNLOADING AREA.
- HYDROGEN OUTLET SUPPLY PRESSURE FROM THE BULK SUPPLY TRUCK OR FROM THE PORTABLE BOTTLE RACK SHALL BE LIMITED TO 475 PSIG. PROVIDE SUSTAINABLE REGULATOR AND RELIEF CAPABILITY FOR ACCOMMODATING THE 475 PSIG OPERATING PRESSURE/800PSIG DESIGN PRESSURE OF THE DOWNSTREAM SYSTEM.
- PROVIDE EXCESS FLOW VALVE PROTECTION DOWNSTREAM OF THE BULK SUPPLY TRUCK OR PORTABLE BOTTLE RACK PRESSURE REGULATOR. EXCESS CHECK VALVE SHALL BE RATED FOR CLOSURE AT 150 SCFH MINIMUM FLOW.
- TEMPORARY SUPPLY HOSE SHALL BE UTILIZED TO CONNECT THE EXCESS FLOW VALVE OUTLET TO THE P77 HYDROGEN MANIFOLD CONNECTION UPSTREAM OF THE P77/F504 ISOLATION VALVE SHALL BE 3000 PSIG MINIMUM 14 TO 1 BURST STRENGTH 1/2" HPT CONNECTIONS AND APPROVED/RATED FOR HYDROGEN SERVICE. HOSE LENGTH IS APPROXIMATELY 80 FT. HOSE TO BE CLEARLY MARKED FOR PRESSURE RATING.
- TEMPORARY VENT HOSE SHALL BE UTILIZED FOR CONNECTING THE INCOMPRESSIBLE OUTLET CONNECTION AND DIRECTING THE VENTED GAS BACK TO THE UNLOADING STATION AREA SHALL BE 800 PSIG MINIMUM 14 TO 1 BURST STRENGTH 1/2" HPT CONNECTIONS AND APPROVED/RATED FOR HYDROGEN SERVICE. HOSE LENGTH IS APPROXIMATELY 75 FT. HOSE TO BE CLEARLY MARKED FOR PRESSURE RATING.

OPERATING DATA

SEE NOTE 6

PSIG	SCFH	F	BY	REMARKS
1	2200	125	75	NOTE*1
2	90	125	75	NOTE*1



DESIGN DATA							
P	NORMAL		UPSET		BY	K	REMARK
	PSIG	F	PSIG	F	TIME		
1	2500	200					
2	120	200				IN	
						IN	

- REFERENCES: (AIR PRODUCTS)
- 100 SX 24410 SCHEMATIC FLOW DIAGRAM - BULK GAS SUPPLY SYSTEM
 - 100 SX 10074-1000 PRESSURE, RELIEFING STATION AND EXCESS FLOW BARRIERS CABINETS AND SUPPORT ASSEMBLY
 - 100 SX 20340-0000 NINE VESSEL BULK GAS PRODUCT STORAGE MODULAR ASSEMBLY MODEL 1
 - 302-0302-00000 GENERATOR H₂ AND CO₂ GAS CONTROL SYSTEM HDS
 - 100 SX 50010 HYDROGEN STORAGE AND SUPPLY SYSTEM
 - 12521300 GAS CONTROL, PIPING DIAGRAM, D.E. BRATING

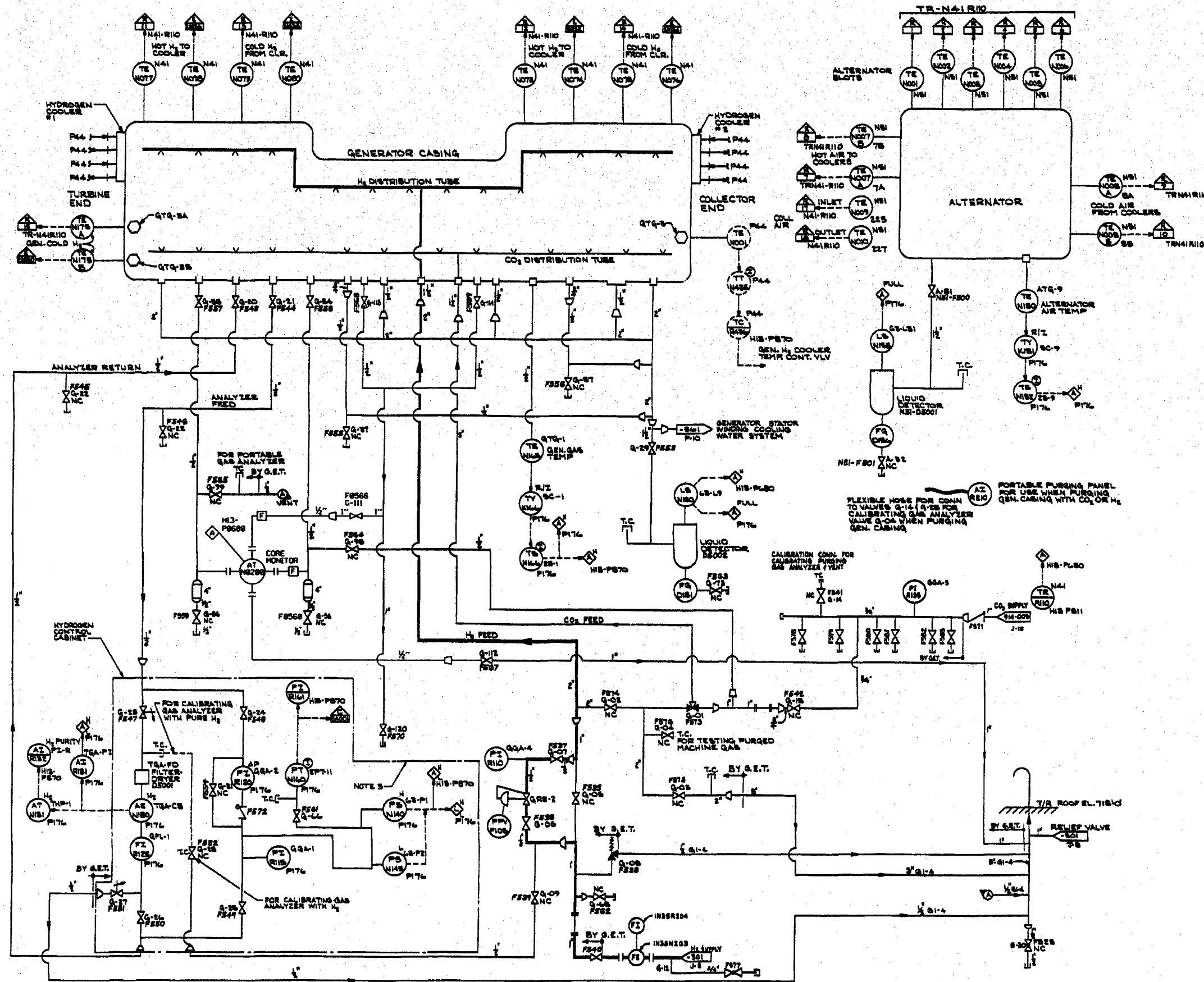
(Rev. 15 10/07)

PERRY NUCLEAR POWER PLANT

Hydrogen Supply System

Figure 10.2-4

(Dwg. D-302-301)



- NOTES:
1. THIS DRAWING IS A SCHEMATIC DIAGRAM OF THE VENDOR SUPPLIED GAS CONTROL SYSTEM. IT IS INTENDED TO SHOW MAJOR EQUIPMENT, SYSTEM INTERFACES AND INSTRUMENTATION AND CONTROL IMPLEMENTATION IN SUFFICIENT DETAIL TO PERMIT UNDERSTANDING THE SYSTEM OPERATION.
 2. A SYSTEM TROUBLE ALARM FOR THE H2-P176 PANEL IS TRANSMITTED TO D-302-P584.
 3. ALL PANELS CARRY PREFIX INDS UNLESS NOTED OTHERWISE. DEVICES WITHIN BOUNDARY ARE LOCATED IN THE GAS TIGHT COMPARTMENT OF THE HYDROGEN AND STATOR COOLING WATER CABINET, H2-P176.
 4. VALVES SHOWN IN NORMAL POSITION FOR AUTOMATIC OPERATION IN HYDROGEN.
 5. ALL INSTRUMENTS CARRY PREFIX INDS UNLESS NOTED OTHERWISE. G.E.T. INSTRUMENT DESIGNATIONS ARE SHOWN ADJACENT THE INSTRUMENT TAG NUMBERS FOR CORRELATION WITH G.E.T. SUPPLIED DOCUMENTATION.
 6. HYDROGEN PIPING WILL NOT BE ROUTED THROUGH AREAS CONTAINING SAFETY RELATED EQUIPMENT.

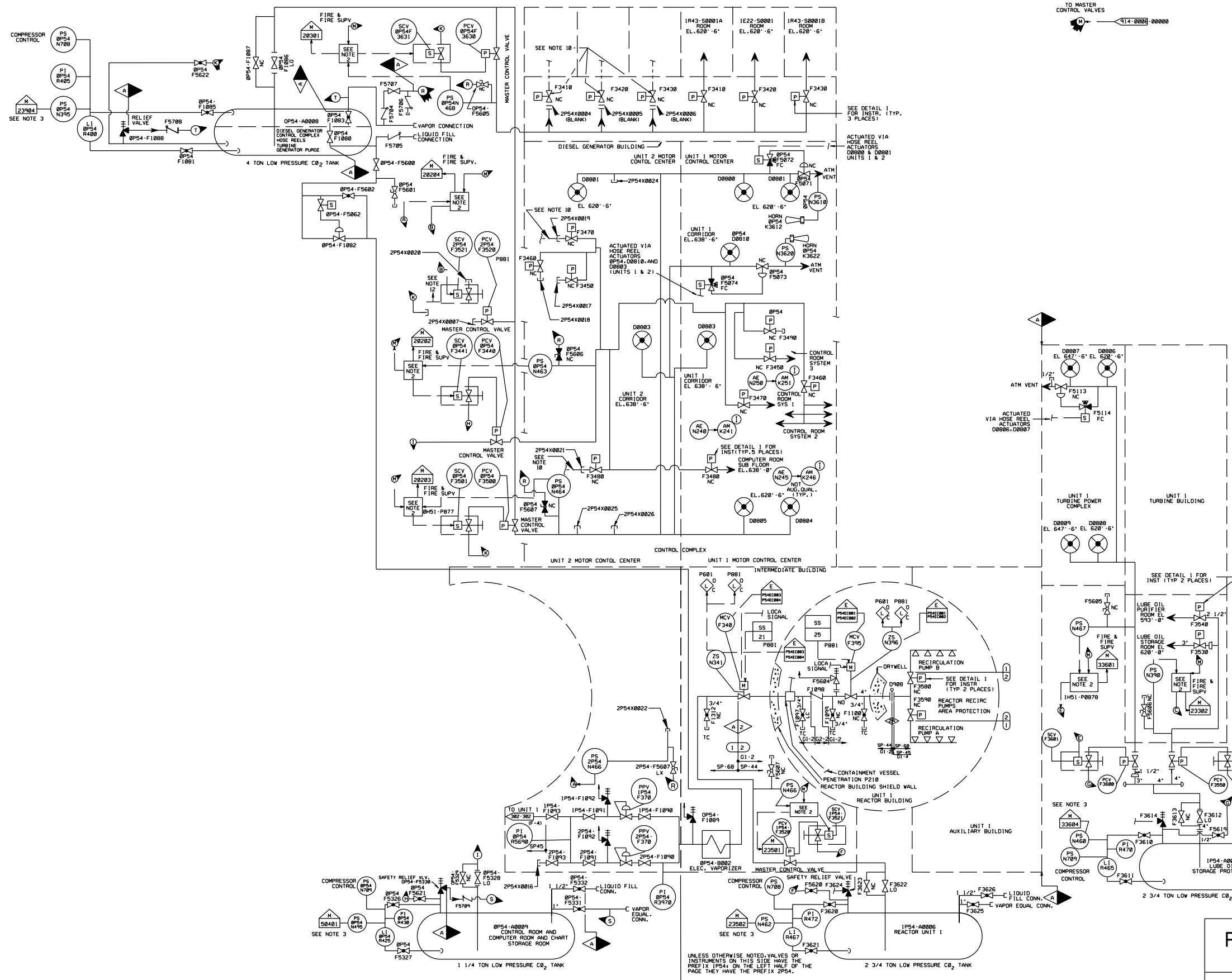
- REFERENCES:
- D-302-222 TURBINE BUILDING CLOSED COOLING SYSTEM P44
 - D-302-201 HYDROGEN SUPPLY SYSTEM H2S
 - D-302-205 CARBON DIOXIDE SYSTEM P54
 - 4549-13-016 GENERATOR ELECTRICAL OUTLINE, G.E.T. DNG. 7742604
 - 4549-13-052 GAS CONTROL PIPING DIAGRAM, G.E.T. DNG. 12501309
 - 4549-13-074 CABINET OUTLINE HYDROGEN AND STATOR COOLING G.E.T. DNG. 12501307
 - 4549-13-177 ALTERNATOR CONNECTIONS, G.E.T. DNG. 34018848
 - 4549-13-177 ALTERNATOR MECHANICAL OUTLINE, G.E.T. DNG. 34018848
 - 4549-65-027 SCHEMATIC DIAGRAM HYDROGEN AND STATOR COOLING G.E.T. DNG. 15923572
 - 4549-65-048 GENERATOR PIPING CONNECTION, G.E.T. DNG. 13303962
 - 4549-13-050 CO2 MANIFOLD OUTLINE, G.E.T. DNG. 15923547
 - 4549-13-054 FLAT TRAP OUTLINE, G.E.T. DNG. 14204540
 - D-302-261 GENERATOR STATOR WINDING COOLING WATER SYSTEM H43
 - 4549-65-075 GAS CONTROL PIPING DIAG. G.E.T. DNG. 2834594

(Rev. 16 10/09)

PERRY NUCLEAR POWER PLANT

Generator H₂ and CO₂ Gas
Control System

Figure 10.2-5
(Dwg. D-302-302)



OPERATING DATA						
	PSIG	GPM	"F	BY	REMARKS	REV
	300		0"			

DESIGN DATA						
	NORMAL	UPSET	PSIG	"F	TIME	BY
1	300	0"	300	0"		
2	300	0"	500	0"		
3						
4						

- NOTES:
- THE CONTROL UNIT FOR EACH HAZARD AREA SELECTOR CONTROL VALVE INCLUDES:
 - A TIMER TO LIMIT THE DISCHARGE PERIOD
 - SUPERVISORY RELAYS TO MONITOR POWER SUPPLY TO THE UNIT AND INTERCONNECTING CIRCUITRY AND OPERATIONAL RELAYS TO INITIATE OPERATION OF THE ELECTRO-MANUAL PILOT VALVES, MASTER VALVES, AND INITIATE A FIRE ALARM SIGNAL. DETAILS ARE SHOWN ON VENDOR DWG.
 - THE CONTROL UNITS FOR THE MASTER CONTROL VALVE HAVE NECESSARY RELAYS TO USE SELECTOR VALVE CONTROL UNIT SIGNALS TO OPERATE THE SELECTOR VALVES. DETAILS SHOWN ON VENDOR DWG.
 - ALL ALARMS PRINT OUT AT THE SECONDARY ALARM STATION.
 - PRIMARY METHOD OF SYSTEM INITIATION SHALL BE BY THE LOCAL MANUAL PULL STATIONS (UNIT 1 & 2).
 - APPLICABLE TO CO₂ SYSTEMS ASSOCIATED WITH PANELS 1 AND 2 H51P19A, 1 AND 2 H51P20A, 1 AND 2 H51P20B, 1 AND 2 H51P21A, AND 1 AND 2 H51P21B.
 - SWITCH PROVIDES OVERRIDE TO INADVERTENT CO₂ HVAC FAN TRIP SIGNAL FOR SYSTEMS 1 AND 2 H51P19A, 1 AND 2 H51P20A, AND 1 AND 2 H51P21A ONLY.
 - INDIVIDUAL BREAKGLASS STATIONS (1 ELECTRO-MANUAL PILOT CABINET/ROOM) ARE PROVIDED FOR MANUAL INITIATION OF THE CO₂ SYSTEM FOR EACH DIESEL GENERATOR ROOM.
 - DELETED
 - THE SYMBOL DESIGNATES THOSE NON-SAFETY PORTIONS OF THE SYSTEM WHERE THE AUGMENTED QUALITY ASSURANCE PROGRAM APPLIES.
 - ABANDONED IN PLACE PER TECHNICAL ASSIGNMENT FILE B1653.
 - DETAIL 1 AND INSTRUMENT/VALVE CROSS REFERENCE TABLE SEE DWG. 914-0005-00000.
 - MASTER SELECTION VALVE 2P54F3521 AND PANEL 2H51P0216 HAVE BEEN ABANDONED IN PLACE PER ECP 12-0017.

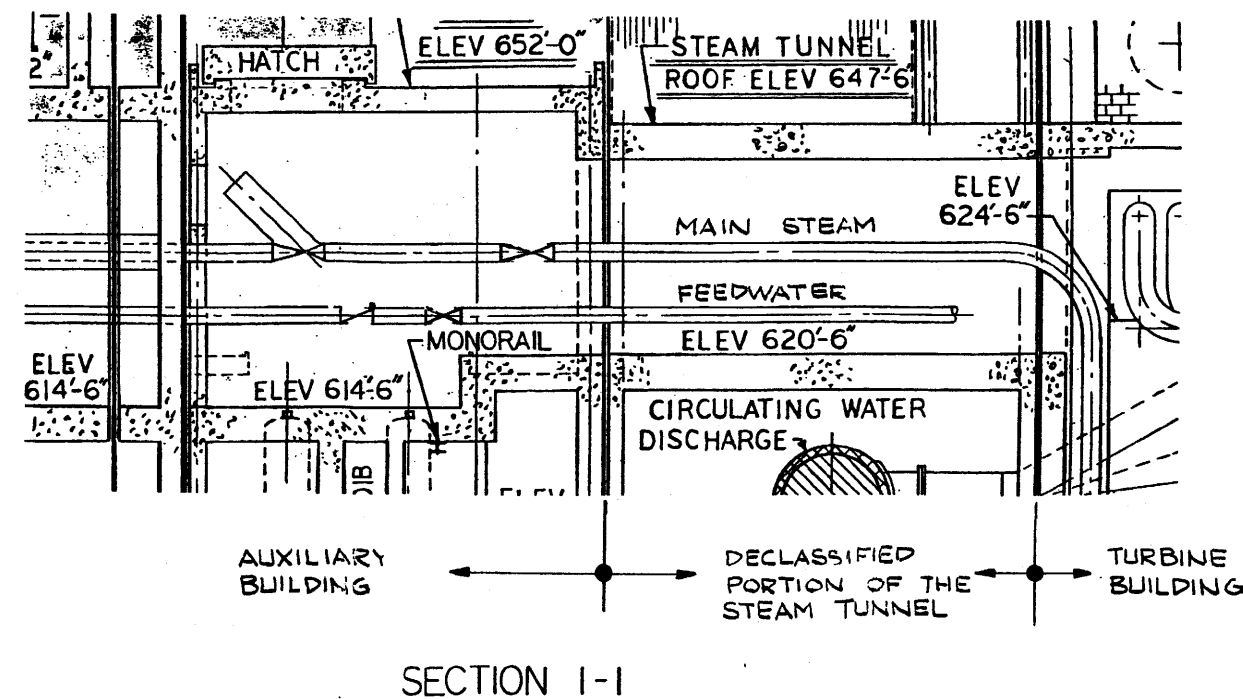
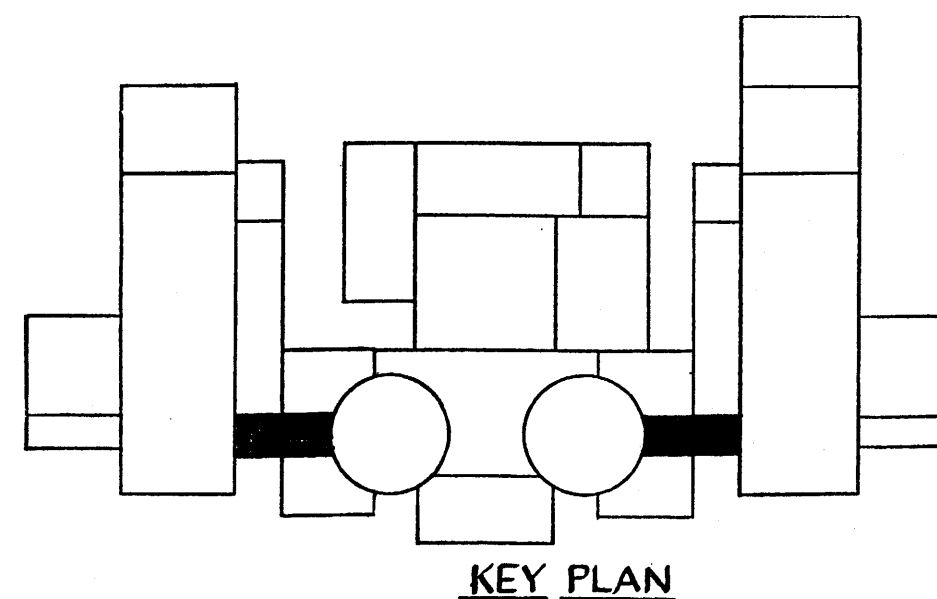
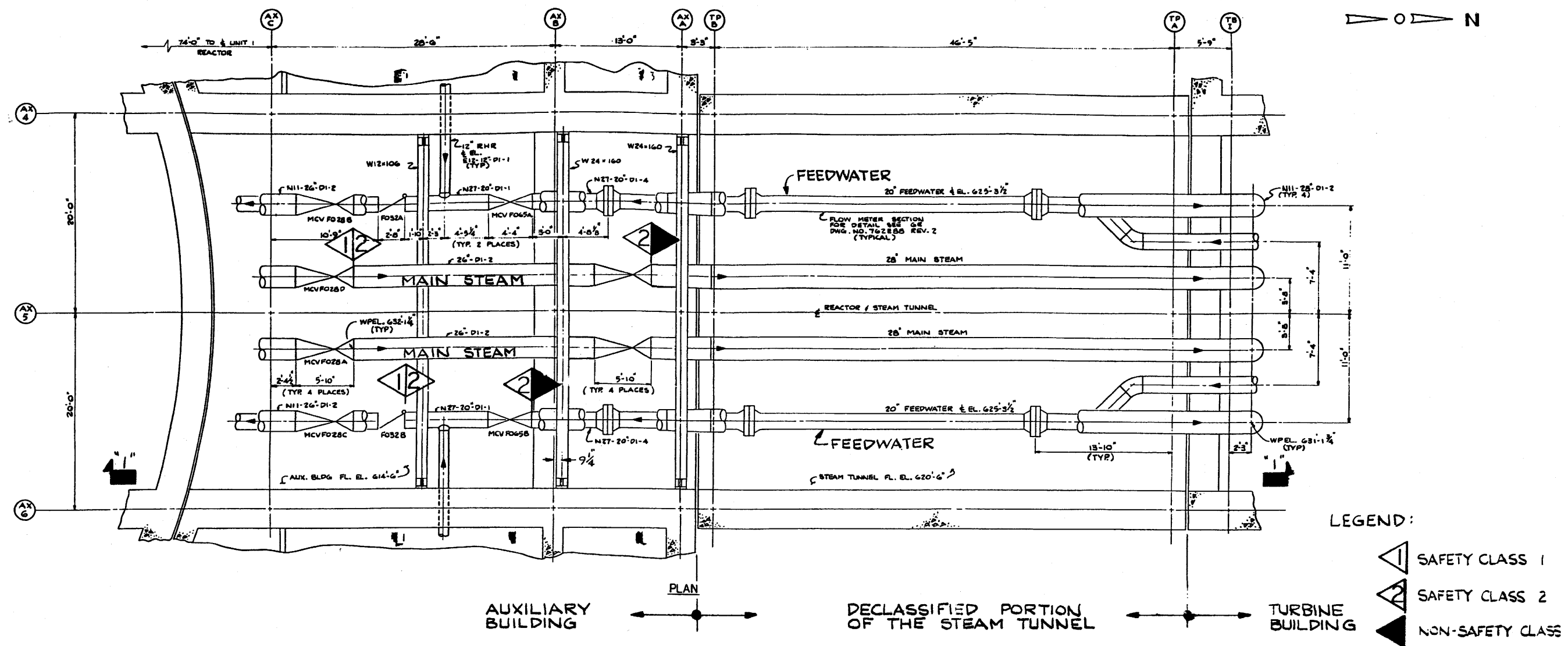
(Rev. 18 10/13)

PERRY NUCLEAR POWER PLANT
10 CENTER RD., PERRY, OHIO 44081

FIRE SERVICE CARBON DIOXIDE

Figure 10.2-6

(DWG. D-914-0005-00000)



NOTE:

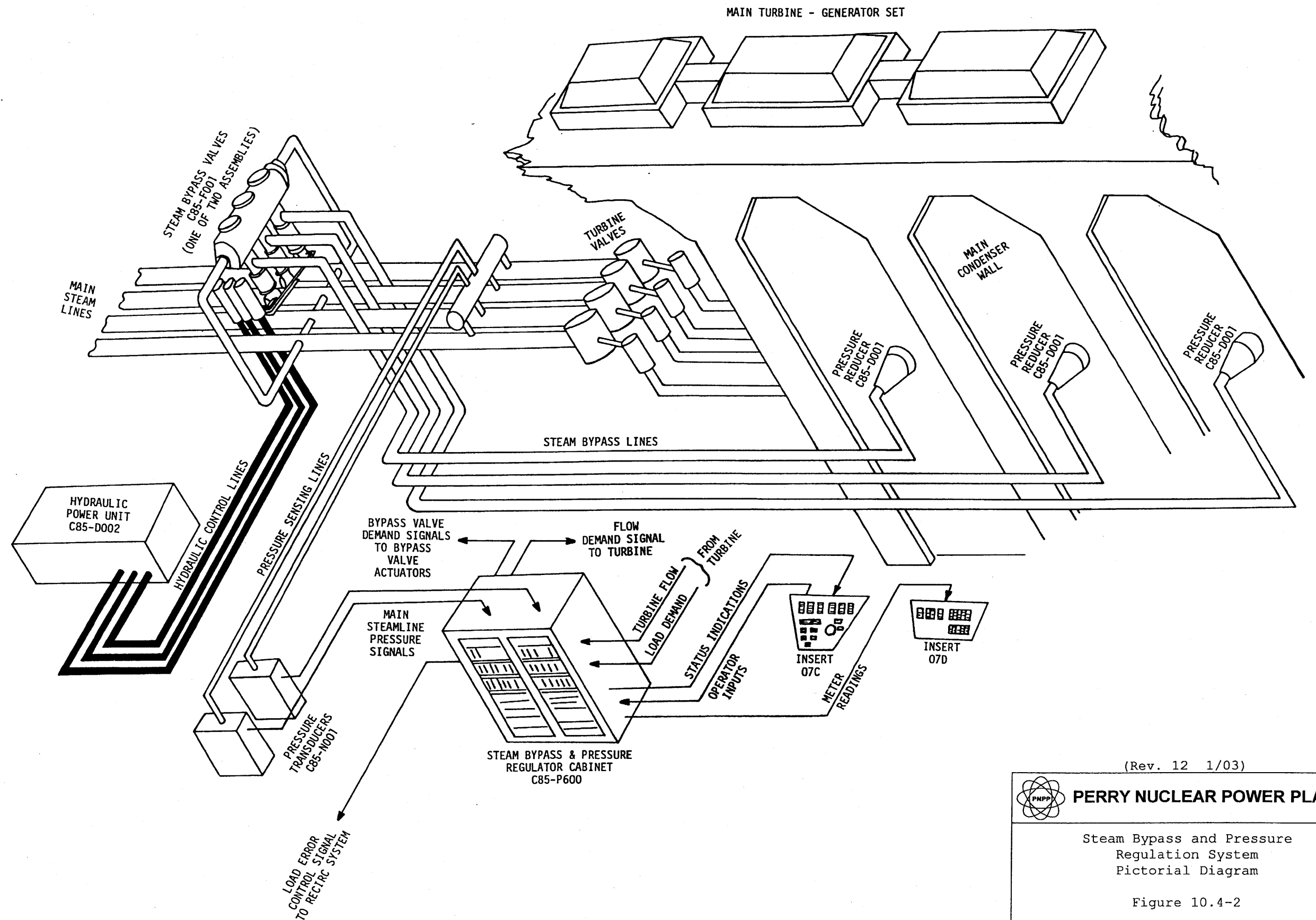
- ALL BEAM SIZES, RESTRAINT LOCATIONS AND DIMENSIONS ARE APPROXIMATE
- 2 RESTRAINTS ALLOW AXIAL GROWTH, BUT LIMIT AXIAL ROTATION.

(Rev. 12 1/03)

PERRY NUCLEAR POWER PLANT

Steam Tunnel Arrangement

Figure 10.3-1



(Rev. 12 1/03)

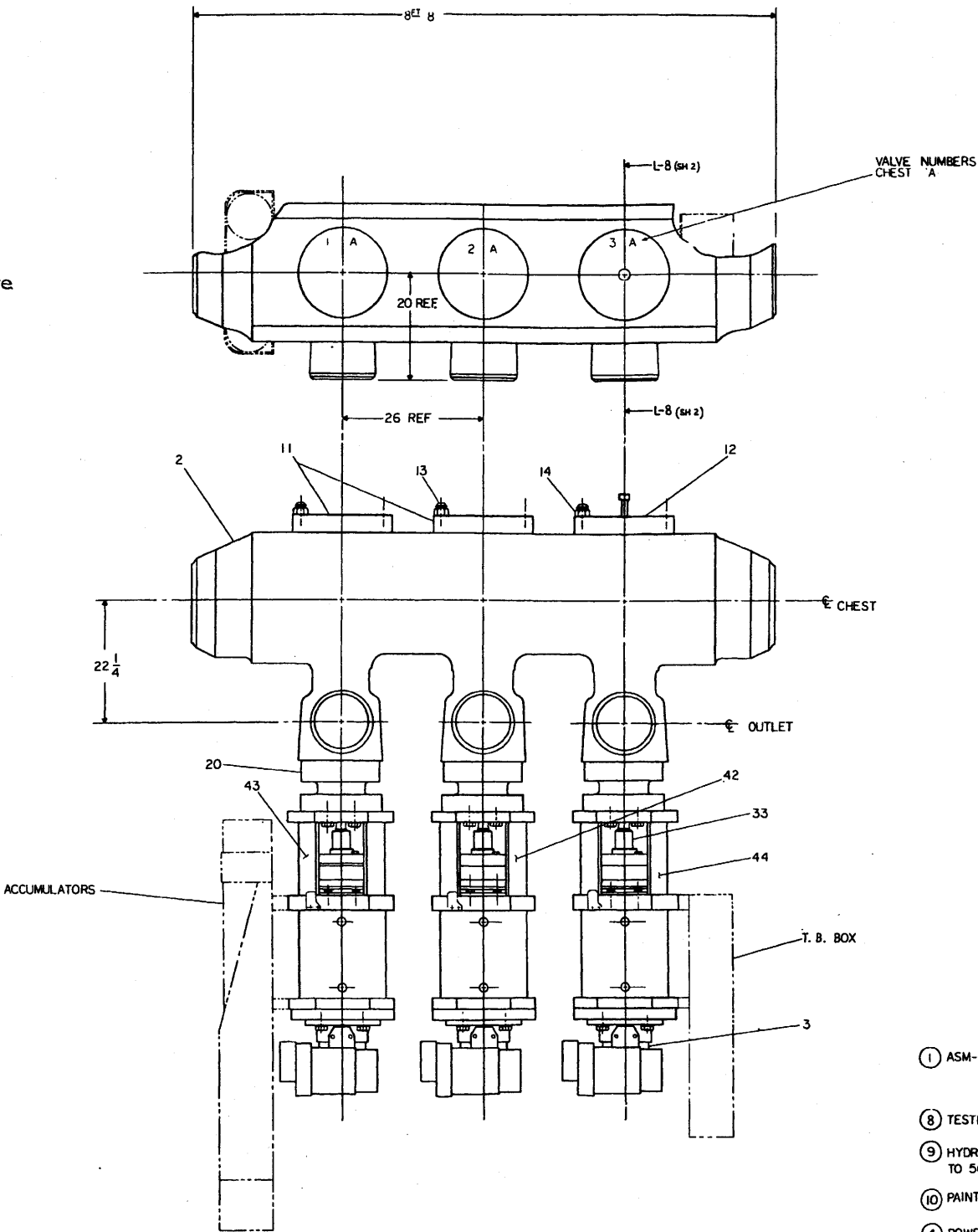
PERRY NUCLEAR POWER PLANT

Steam Bypass and Pressure
Regulation System
Pictorial Diagram

Figure 10.4-2

NOMENCLATURE

1. Assembly
2. Bypass Casing
3. Control Pac
4. Power Actuator
8. Test Instruction
9. Hydraulic Test Valve
10. Paint Instruction
11. Head
12. Head
13. Stud
14. Nut
15. Gasket
16. Valve Seat
17. Bolt
18. Lockring
19. Gasket
20. Stand
21. Stud
22. Nut
23. Gasket
24. Bushing
25. Bushing
26. Valve
27. Stem
28. Dowel
29. Locknut
30. Retainer
31. Packing Gland
32. Grafoil Pack
33. Stem Nut
34. Pin
35. Bolt
36. Bolt
37. Stud
38. Stud
39. Stud
40. Nut
41. Dowel
42. Spring Housing
43. Spring Housing
44. Spring Housing
45. Bolt
52. Lockwasher
57. Cotter Pin
60. Flange
61. Flange
62. Flange
63. Gasket
64. Gasket
65. Gasket
66. Nut



TEST DATA-FOR FACTORY USE
 TEST #1-AVE. NET UPWARD FORCE = $\frac{1728}{1} = 10\%$
 TEST #2-OPENING TIME-INDIVIDUAL VALVES = $\frac{0.26}{1} \text{ SEC} = 10\%$
 OPENING TIME-ALL VALVES TOGETHER = $\frac{0.27}{1} \text{ SEC} = 10\%$

- ① ASM-GI
- ⑧ TESTING INST.
- ⑨ HYDROSTATIC TEST VALVE SEAT TO 500 PSI
- ⑩ PAINT INST.
- ④ POWER ACTUATOR

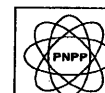
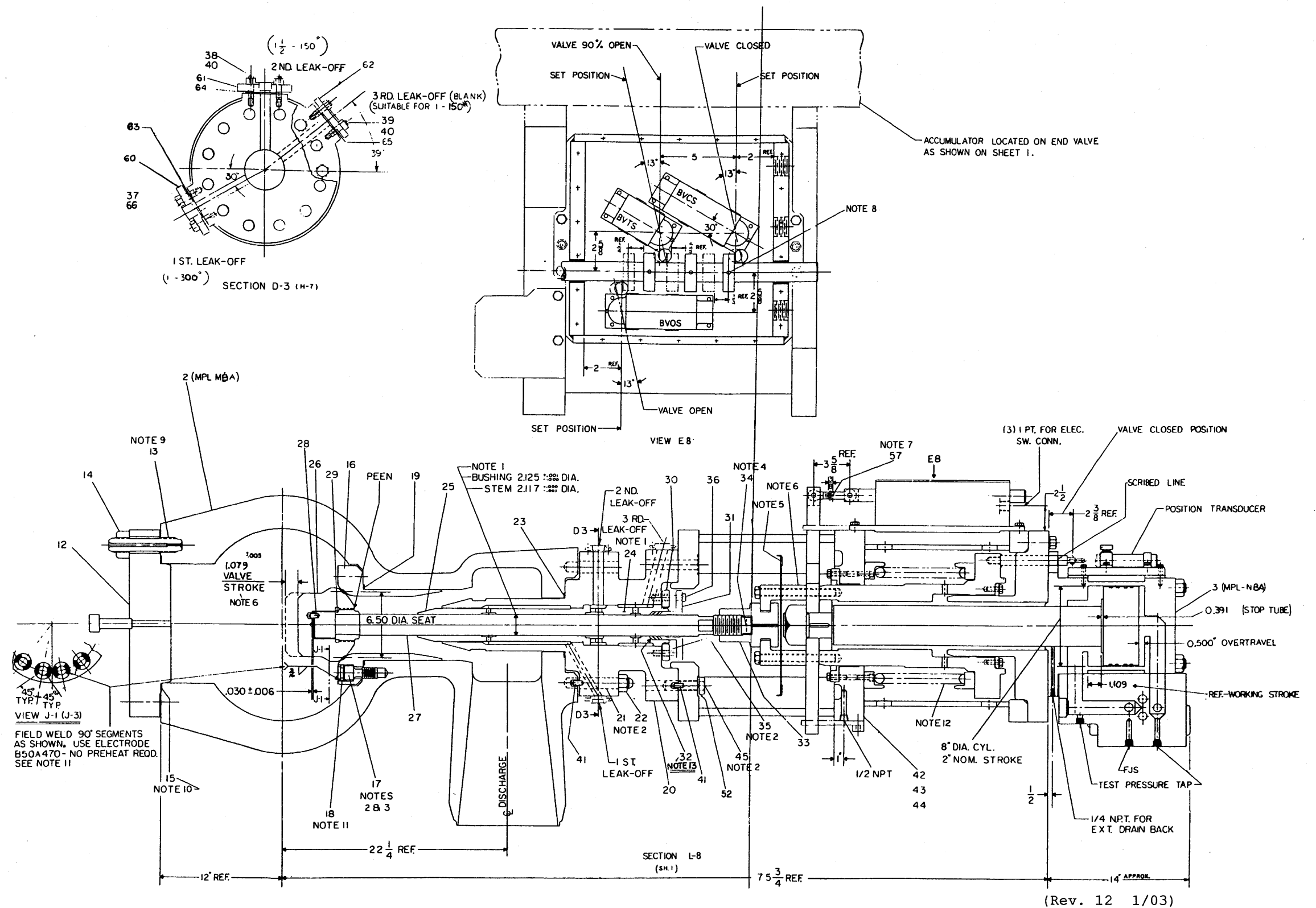
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Bypass Valves Chest A

Figure 10.4-3 (Sheet 1 of 2)



PERRY NUCLEAR POWER PLANT

Bypass Valves Chest A

Figure 10.4-3 (Sheet 2 of 2)