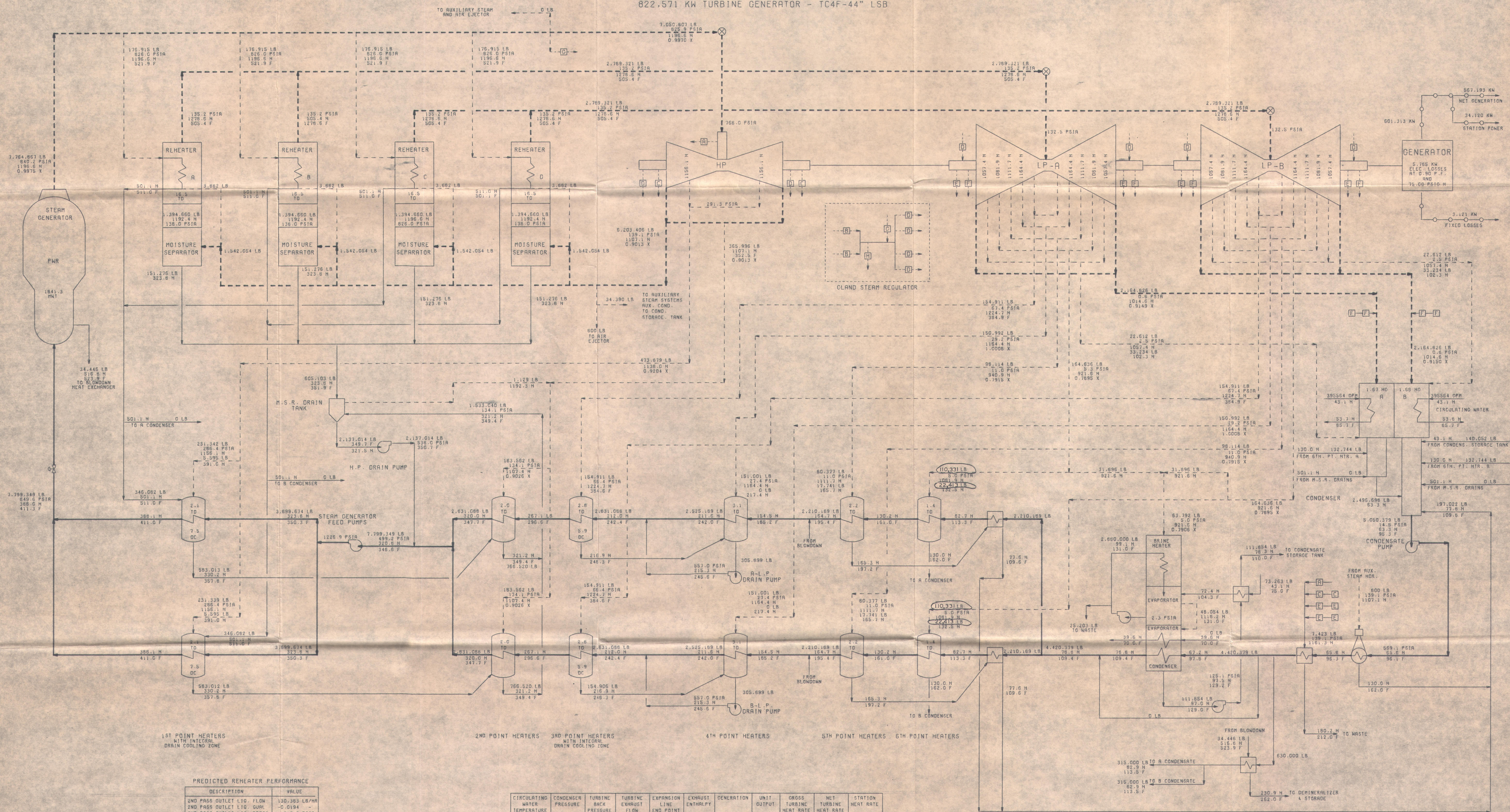


# 822,571 KW TURBINE GENERATOR - TC4F-44" LSB



PREDICTED REHEATER PERFORMANCE

DESCRIPTION	VALUE
2ND PASS OUTLET LIG. FLOW	130,383 LB/HR
2ND PASS OUTLET LIG. QUAL.	0.0194
2ND PASS OUTLET LIG. PRESS.	817.9 PSIA
4TH PASS OUTLET LIG. FLOW	42,662 LB/HR
4TH PASS OUTLET LIG. QUAL.	0.0132
EXCESS STEAM FLOW	3,882 LB/HR

CIRCULATING WATER TEMPERATURE	CONDENSER PRESSURE	TURBINE BACK PRESSURE	TURBINE EXHAUST FLOW	EXPANSION LINE END POINT	EXHAUST ENTHALPY	GENERATION	UNIT OUTPUT	GROSS TURBINE HEAT RATE	NET TURBINE HEAT RATE	STATION HEAT RATE
F	IN. HG	IN. HG	LB/HR	BTU/LB	BTU/LB	KW	KW	BTU/KWH	BTU/KWH	BTU/KWH
75.0	1.67	1.67	4,329,511	1003.5	1014.6	601,313	567,193	10448	11077	11013

## BASIS OF HEAT BALANCE CALCULATIONS

ELEVATION: APPROXIMATELY 27 FEET ABOVE SEA LEVEL  
 STEAM GENERATOR BLOWDOWN: 0.5 %

PRESSURE DROPS: PRESSURE DROPS FOR THE STEAM GENERATORS, REHEATERS, MOISTURE SEPARATORS, MAIN STEAM P.P., EXHAUST AND EXTRACTION PIPING WERE CALCULATED AT ALL LOADS.

PRESSURES: TURBINE FLANGE PRESSURES ARE SHOWN ON EXTRACTION LINES ADJACENT TO THE TURBINES. HEATER INLET PRESSURES ARE SHOWN ADJACENT TO THE HEATERS.

BASE BALANCE CONDITIONS: THE HEAT BALANCE CONDITIONS SHOWN ON THE DIAGRAM CORRESPOND TO A CIRCULATING WATER TEMPERATURE OF 66 F.

ALL HEAT BALANCE RESULTS ARE PRODUCED BY A COMPUTER PROGRAM PROCESSED ON A IBM 360 COMPUTER.

AUXILIARY POWER REQUIREMENTS ARE CALCULATED FOR ALL EQUIPMENT. THE REQUIREMENTS OF THE FOLLOWING MAJOR EQUIPMENT VARY WITH LOAD.

3 CONDENSATE HEAT PUMPS	2 OPERATING
2 H.P. HEATER DRAIN PUMPS	1 OPERATING
1 L.P. HEATER DRAIN PUMPS	2 OPERATING
2 STEAM GENERATOR FEED PUMPS	2 OPERATING

THE FOLLOWING ARE IMPORTANT AUXILIARY POWER ITEMS WHICH ARE CONSIDERED NOT TO VARY WITH LOAD.

AUXILIARY POWER FOR THESE AND LESSER EQUIPMENT HAS BEEN CALCULATED FOR AVERAGE DAILY REQUIREMENTS.

CIRCULATING WATER PUMPS  
 PRIMARY COOLANT PUMPS  
 BEARING COOLING WATER PUMPS  
 INSTRUMENT AIR COMPRESSOR

REFERENCE:

1. AEC STEAM TABLES 1967
2. STONE & WEBSTER PLANT SPECIFICATIONS
3. SOUTHWEST ENGINEERING

$$\text{GROSS TURBINE HEAT RATE} = \frac{\text{HEAT TO TURBINE CYCLE}}{\text{GENERATION}} = \frac{6,282,513 \times 10^9}{601,313} = 10448 \text{ BTU/KWH}$$

$$\text{NET TURBINE HEAT RATE} = \frac{\text{HEAT TO TURBINE CYCLE}}{\text{GENERATION} - \text{AUXILIARY POWER}} = \frac{6,282,513 \times 10^9}{567,193} = 11077 \text{ BTU/KWH}$$

$$\text{STATION HEAT RATE} = \frac{\text{REACTOR DUTY}}{\text{STATION OUTPUT}} = \frac{6,246,666 \times 10^9}{567,193} = 11013 \text{ BTU/KWH}$$

LEAKAGES

NAME	FLOW	ENTHALPY
A	1.731	1196.0
B	2.517	1107.1
C	360	1107.1
D	2,658	1157.2
E	1,233	1157.2
F	1,625	1157.2
G	6,399	1196.0
H	0	1107.1

LEGEND

- STEAM
- WATER
- POWER, KW
- LB. FLOW, POUNDS PER HOUR
- H. TEMPERATURE, DEGREES FAHR
- F. QUALITY, FRACTION
- TO TERMINAL DIFFERENCE
- DC TERM. DIFFERENCE DRAIN COOLER
- KW. KILOWATTS
- HC. PRESSURE, IN. OF MERCURY, ABS
- PRV. PRESSURE REDUCING VALVE
- PSIA. PRESSURE, LB. PER SQ. INCH, ABS
- PSIG. PRESSURE, LB. PER SQ. INCH, GAGE
- OPM. GALLONS PER MINUTE
- THROTTLE OR INTERCEPT VALVE

TI  
 APERTURE  
 CARD

FOR INFORMATION  
 ONLY

VIRGINIA POWER COMPANY  
 MAINTENANCE AND PERFORMANCE SERVICES  
 PERFORMANCE TESTING AND RESULTS ANALYSIS

**SURRY 1 & 2  
 HEAT BALANCE DIAGRAM  
 1841.3 MW, LOAD**

75 % LICENSED LOAD MAX EVAPORATION

MODEL	NAME	DATE	FILE NO.	SHEET NO.
50-280	TODD PILOT	3-6-85		3 of 6
INSPECTED	3-7-85			
CORRECT	3-7-85			
APPROVED	3-7-85			

REVISIONS

1 2 3 4

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