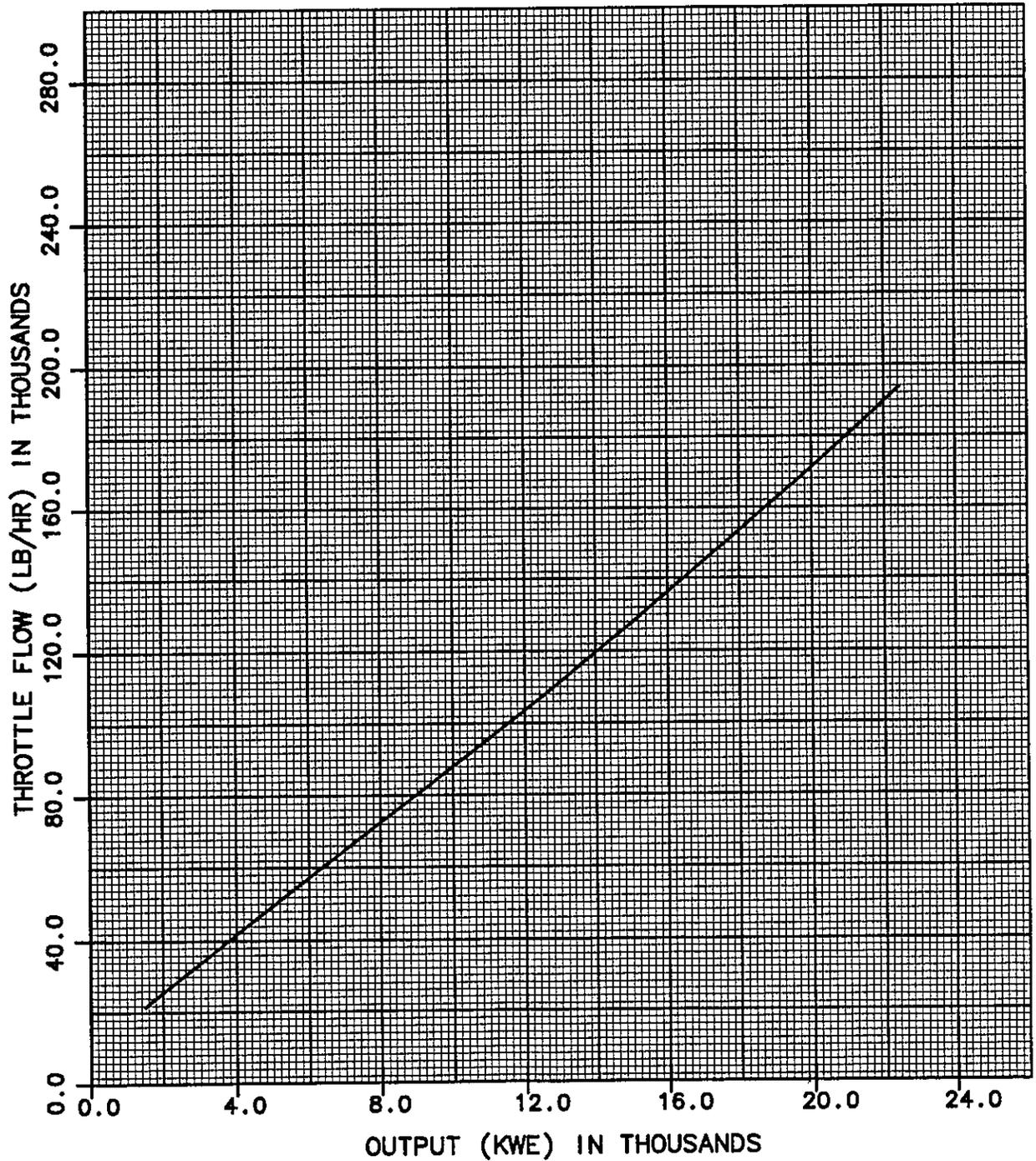
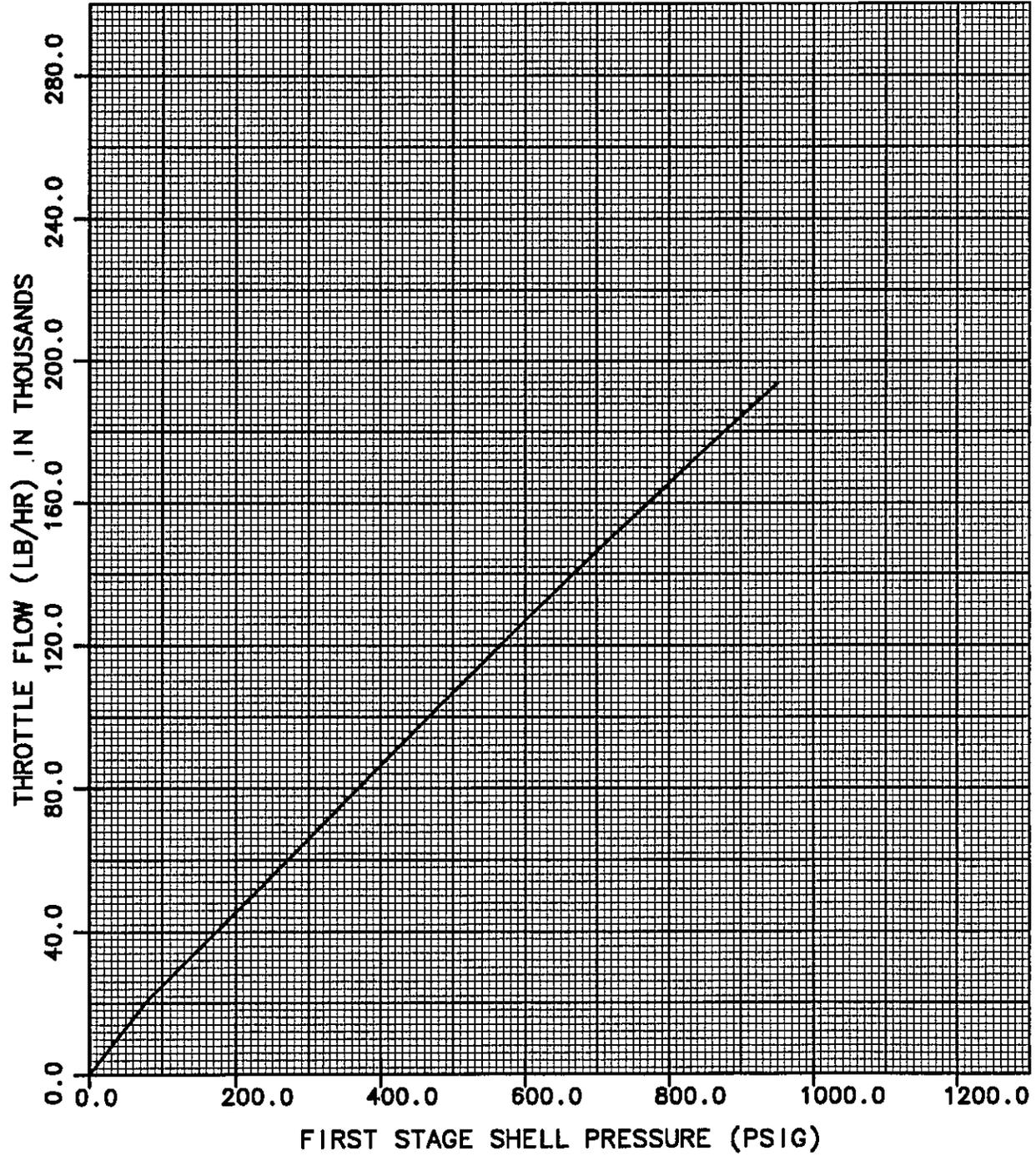


THROTTLE PRESSURE—— 1250.0 PSIG  
THROTTLE TEMPERATURE—— 950.0 F  
EXHAUST PRESSURE—— 2.00 IN HG ABS  
TURBINE RATED SPEED—— 5600 RPM  
GENERATOR RATED OUTPUT— 19700 KWE  
\*\*\* PREDICTED DATA \*\*\*



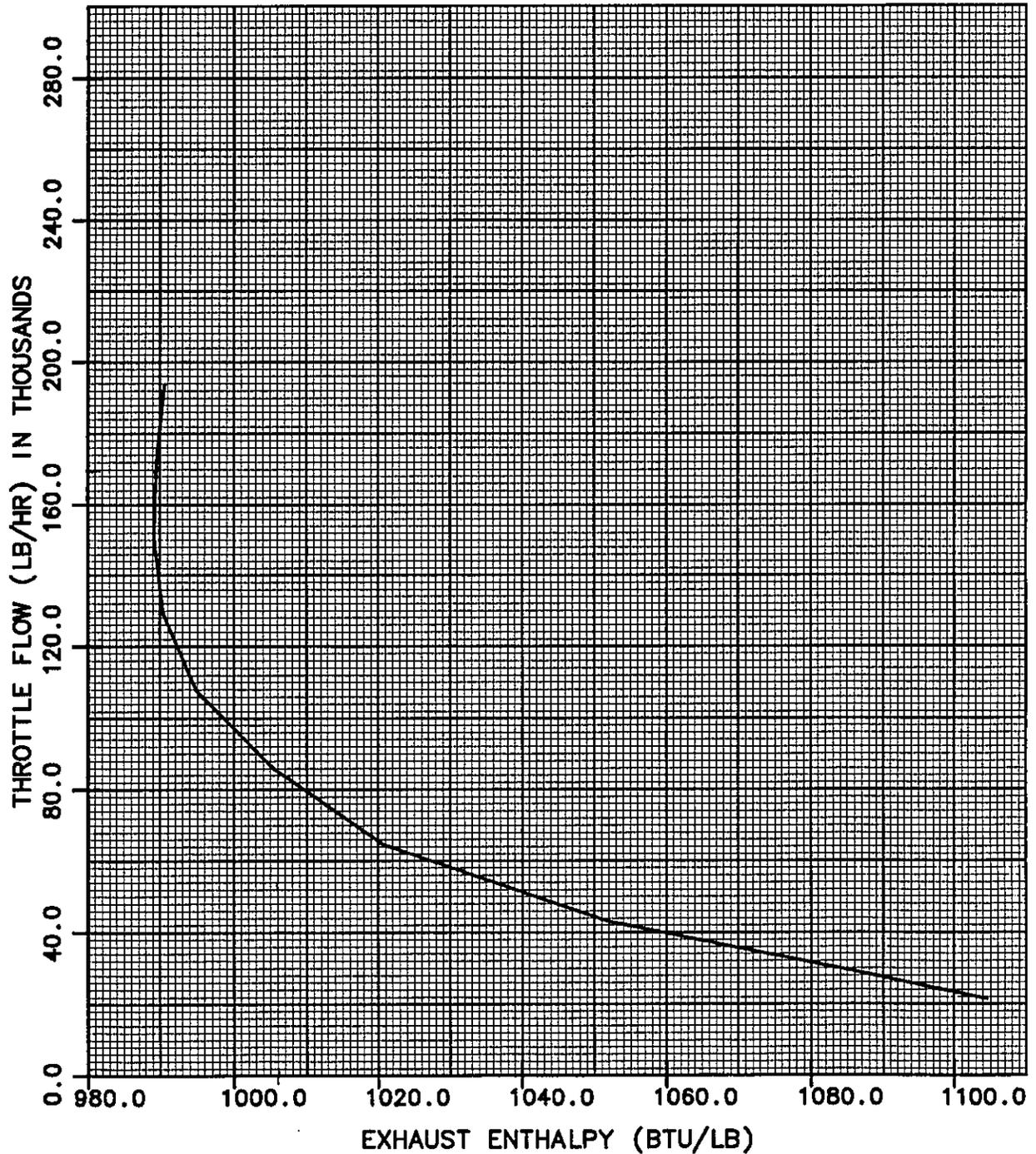
BY-MAT DATE 3-JUN-91

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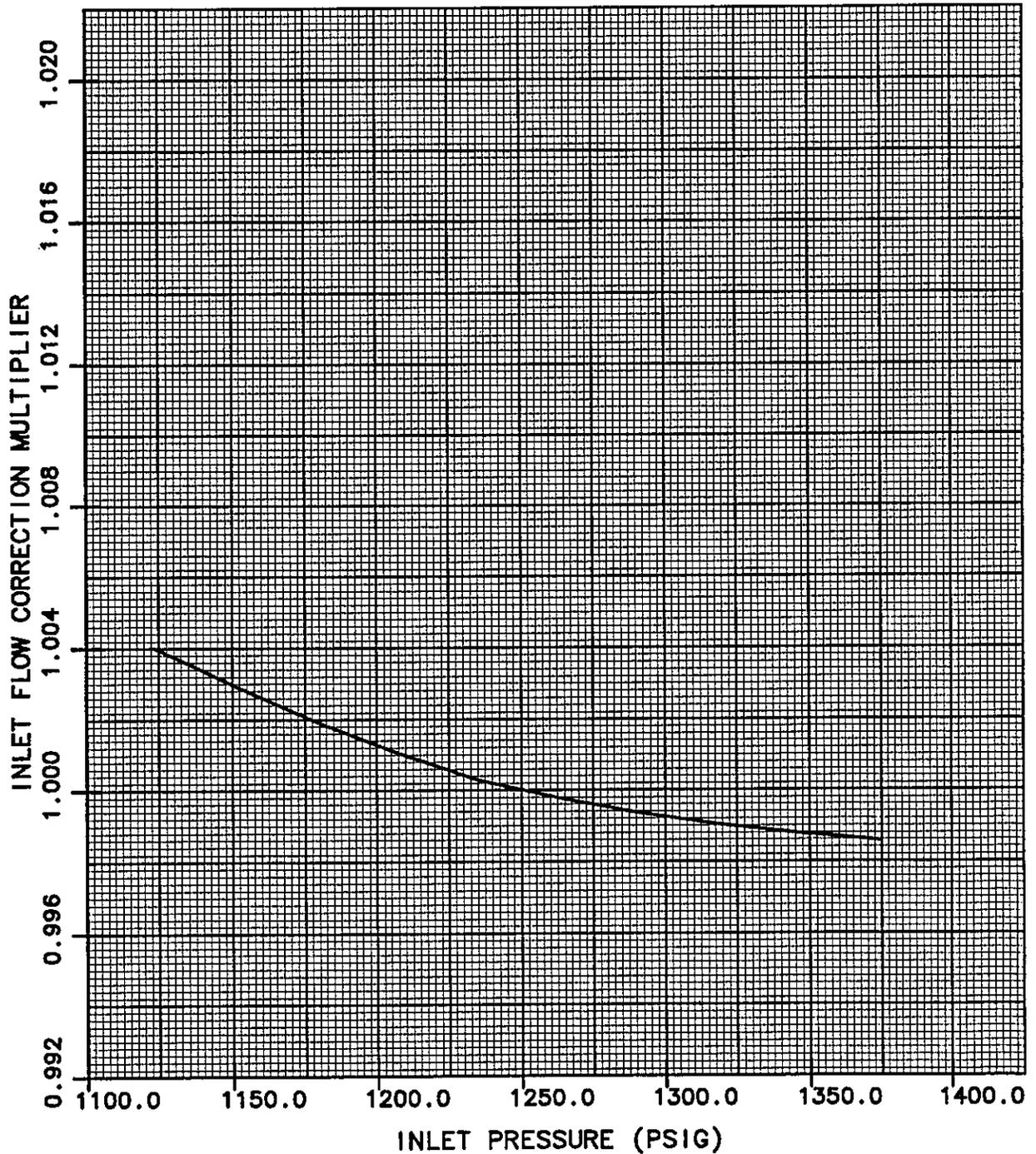
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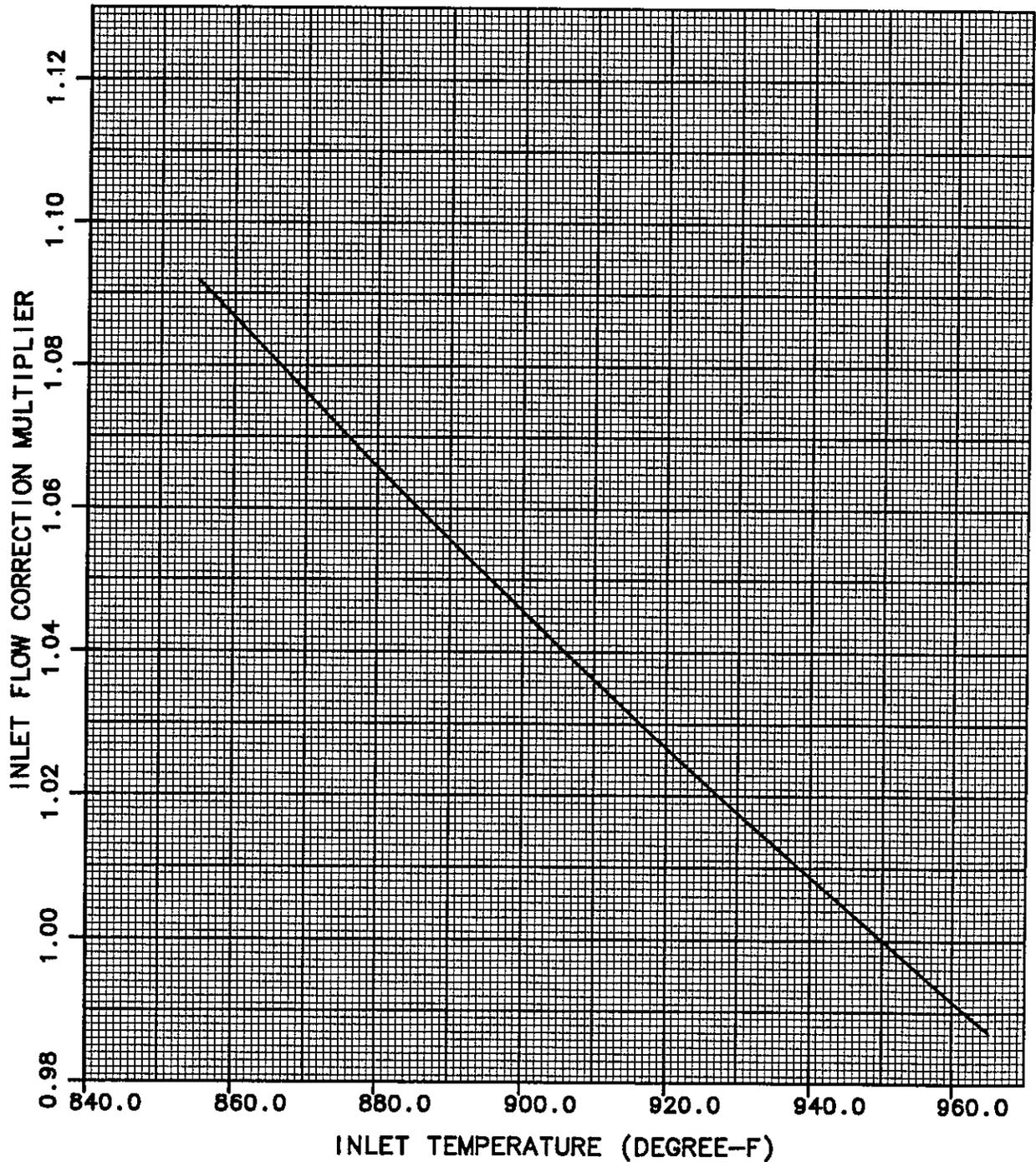
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CURVE DRAWN FOR—— 19700 KWE  
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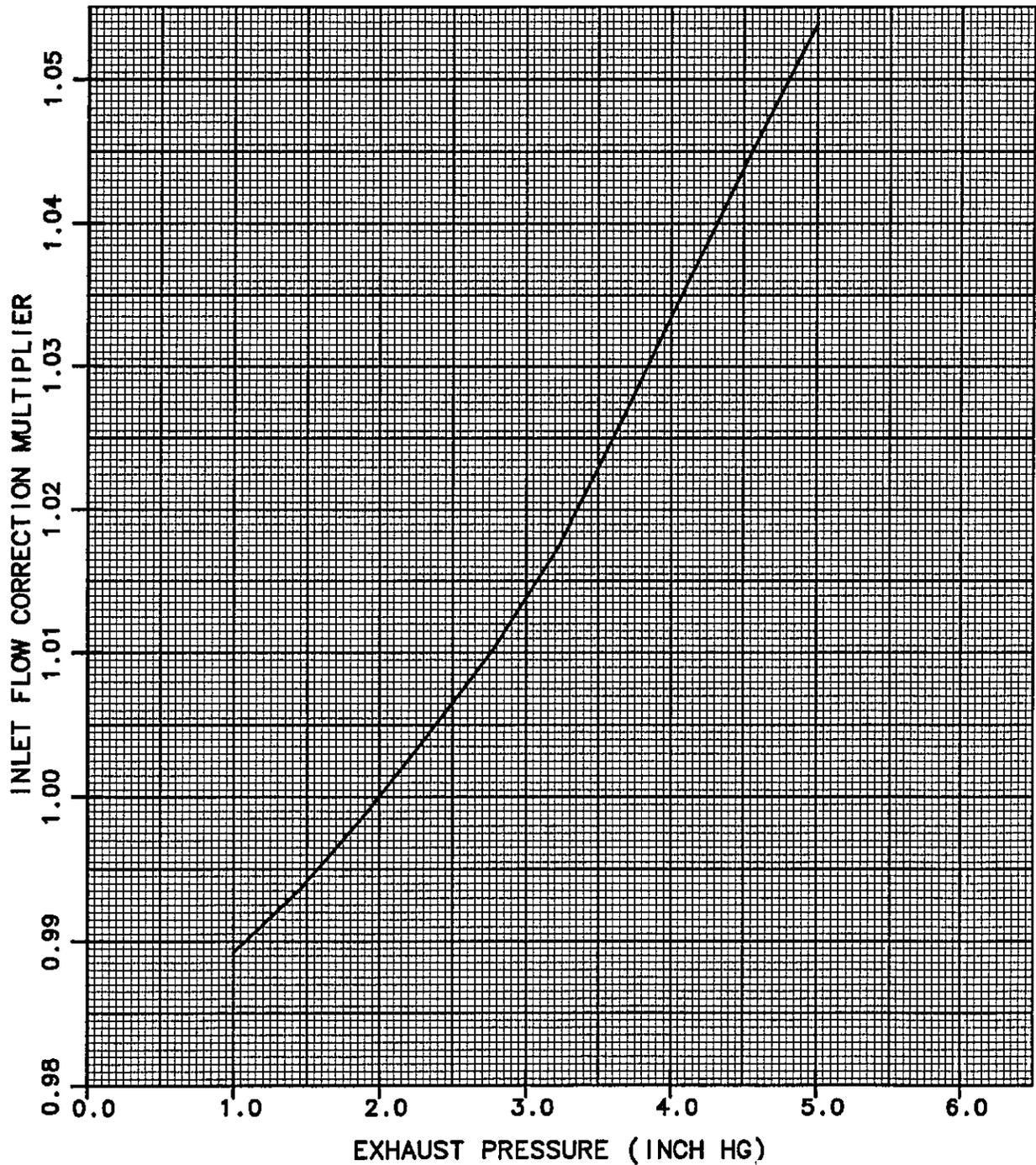
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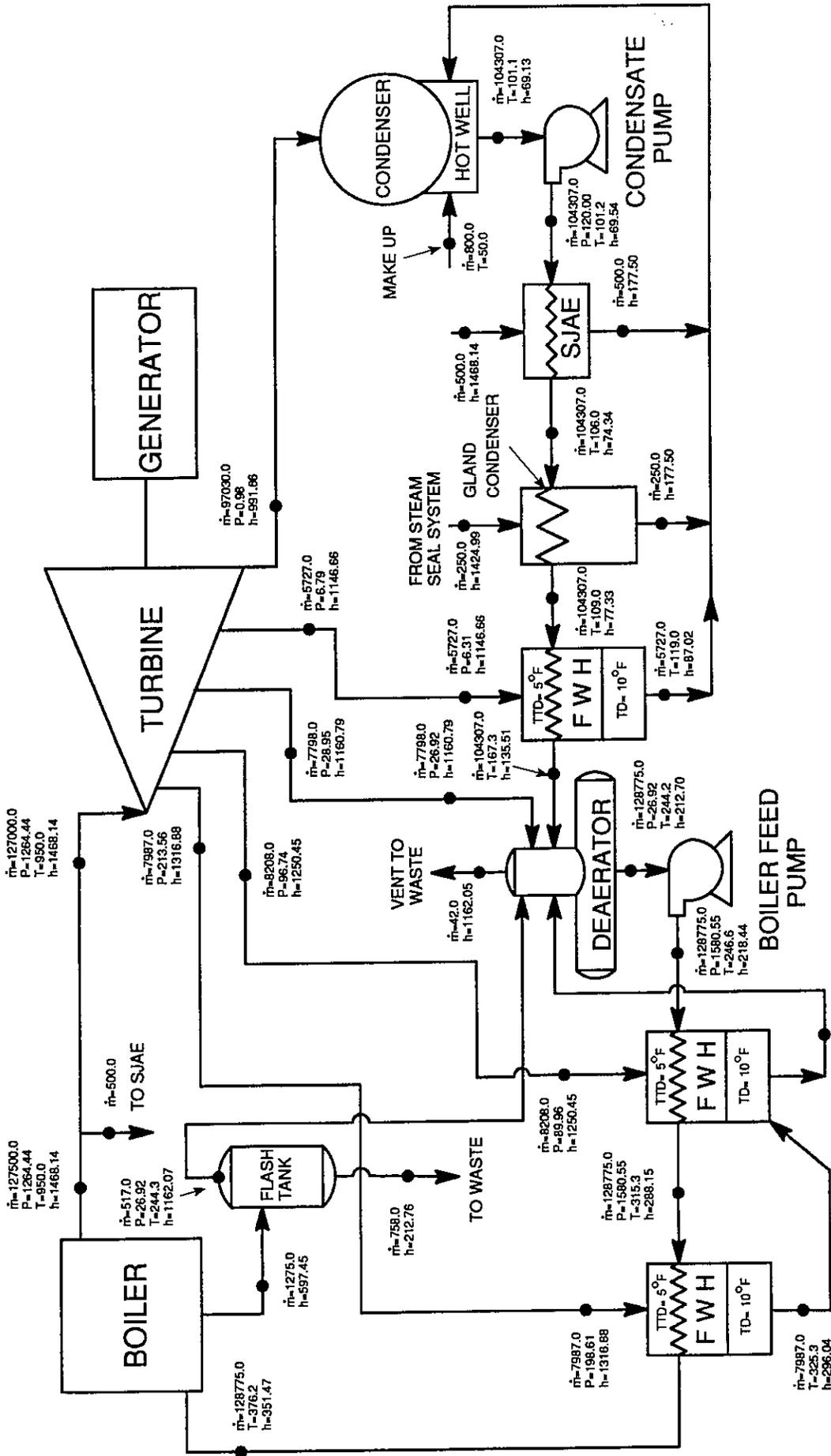
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TURBINE RATED SPEED—— 5600 RPM  
GENERATOR RATED OUTPUT— 19700 KWE  
CURVE DRAWN FOR—— 19700 KWE  
\*\*\* PREDICTED DATA \*\*\*





# HEAT BALANCE DATA

HB #2 75% GUARANTEED THROTTLE FLOW  
14,982 KWE GEN. OUTPUT @ .9 PF AT 2" HGA EXHAUST PRESSURE

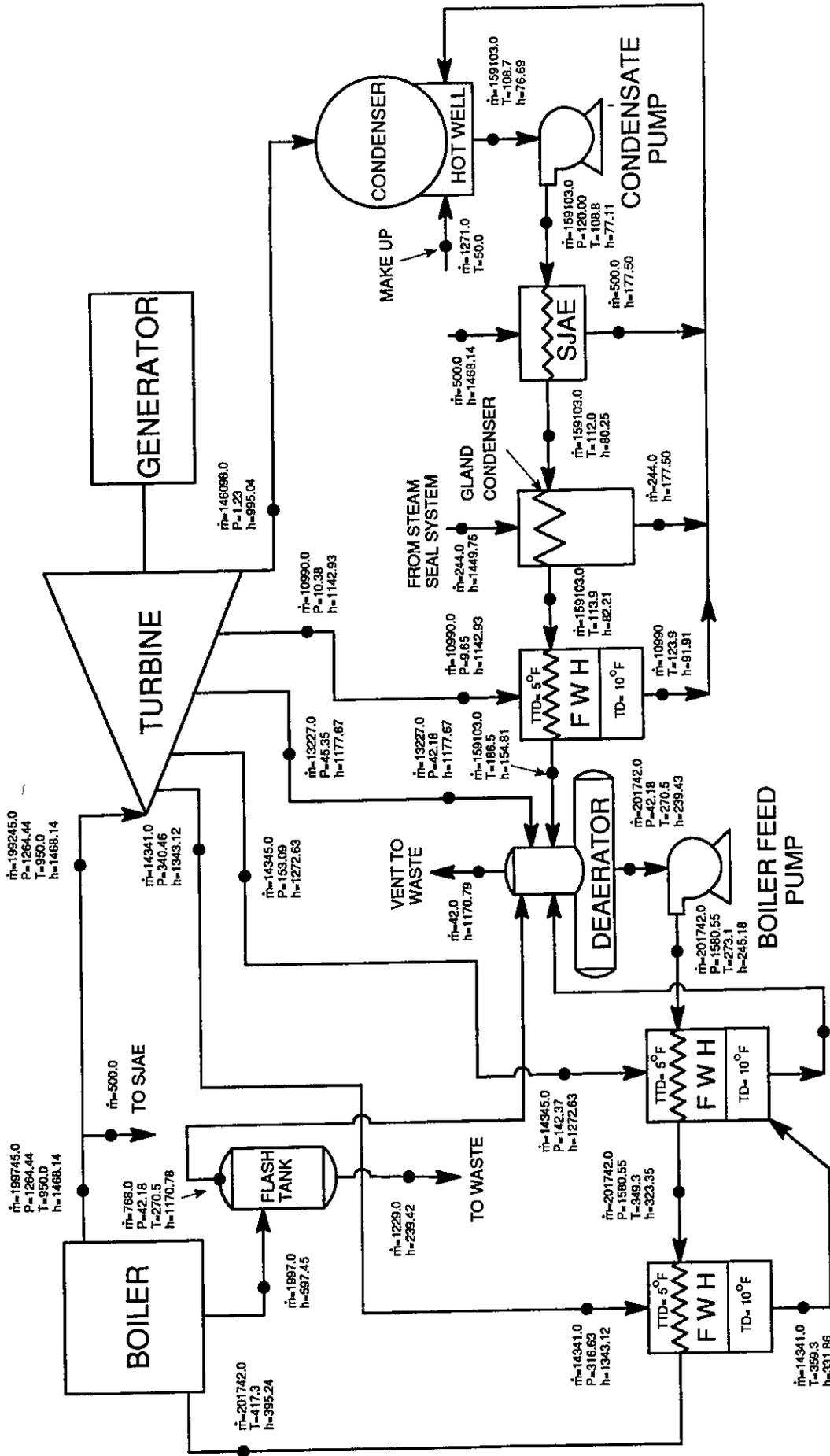


KEY:  
 $\dot{m}$  - FLOW (LB/HR)  
 P - PRESSURE (PSIA)  
 T - TEMPERATURE (F)  
 h - ENTHALPY (BTU/LB)



# HEAT BALANCE DATA

HB #4 VALVES WIDE OPEN  
 22,992 KWE GEN. OUTPUT @ .9 PF AT 2.5" HGA EXHAUST PRESSURE



KEY:  
 $\dot{m}$  - FLOW (LB/HR)  
 P - PRESSURE (PSIA)  
 T - TEMPERATURE (F)  
 h - ENTHALPY (BTU/LB)



Vacuum and Heat Transfer  
SURFACE CONDENSER SPECIFICATIONS

PERFORMANCE

Absolute Pressure @ Steam Inlet (in.HgA).....	2.00
Steam Condensed (lb./hr.).....	126000.
Heat Rejected (Btu/hr.).....	119700000.
Circulating Water (gpm).....	21700.
Water Inlet / Outlet (deg.F).....	85.00 / 96.03
Water Pressure Loss : (ft.Water / psi).....	23.8 / 10.3
Percent Clean.....	90.
Tube Velocity (fps).....	8.50

DESIGN

	MODEL :	78 92 / 18.75 TBTD
Surface Area (sq.ft.) Total / Effective.....		19770. / 19348.
Number of Water Passes.....		2.
Number of Tubes.....		6444.
Outside Tube Diameter (in.) - BWG.....		0.6250 - 22 AW
Total Tube Length (ft.).....		18.75
Design / Test Pressure (psig) :	Shell.....FV&	15.0 / Flooded
	Tubes.....	75.0 / 112.5
Design Temperature (deg.F) :	Shell.....	250.0
	Tubes.....	150.0
Hotwell : bathtub .....supply (min.).....		3.
Steam Inlet (rectangular) (in.) (FF).....		42. x 104.
Water Connections (in.).....		2. - 36.
Condensate Outlet (in.).....		1. - 10.0

MATERIALS

Shell	(A-516-70)	Carbon Steel
Water Boxes	(A-516-70)	Carbon Steel
Water Box Covers	(A-516-70)	Carbon Steel
Baffles	(A-516-70)	Carbon Steel
Tube Support Plates	(A-516-70)	Carbon Steel
Tubes	(A-249-TP316)	316SS
Tube Sheets	(A-516-70)	Carbon Steel

Remarks : Design per HEI, Eighth Edition  
Steam Inlet Impingement Protection Included  
Inlet Tube Ends are Belled  
Ejector Package Not Mounted on the Main Condenser

**STEAM JET EJECTOR PERFORMANCE:**

Pressure maintained (inches HgA)*.....	1.0
Total Fluid Evacuated (lbs/hr).....	108.1
Dry air evacuated (lbs/hr).....	33.8
Motive steam required per element (lbs/hr).....	385.0
Operating steam pressure (psig).....	150.0
Operating steam temperature (deg.F).....	587
Inter condenser cooling water temp. (deg.F).....	CONDENSATE
Inter condenser cooling water required (gpm).....	CONDENSATE
Cooling water pressure drop thru I/A condenser (psi)...	0.5
.....	
.....	
.....	

**STEAM JET EJECTOR DESIGN:**

Model designation.....	2-4A2-108-1/3H
Number of stages.....	TWO
Number of elements for parallel operation.....	TWO
Material of diffuser and suction chamber.....	SA-36/SA-216-WCB
Material of steam nozzles.....	416SS
Type of inter and after condenser.....	IN-LINE
Material of inter and after condenser shell.....	SA-53-B
Tube sheets.....	SA-240-304
Tubes .....0.7500 - 20 BWG AW	SA-249-TP304
Nozzle Extension & Steam Chest.....	Stl
M.A.W.P/ Test Pressure (psig) :	Shell..... 20 / 30
	Tubes..... 300 / 450
Design Temperature (deg.F) :	Shell..... 250
	Tubes..... 150

**APPURTENANCES INCLUDED:**

Steam strainer.....	Included
Interconnecting steam piping.....	Included
Air leakage meter.....	Included
Priming ejector - Size.....	3H(14C)
Steam consumption (lbs/hr).....	835.0
Drainers or traps.....	Included
Design per HEI Construction of I/AC per HEI.....	
Isolation valve(s) at 1st stage discharge.....	Included
.....	
Isolation valve(s) at 2nd stage suction.....	Included
Isolation valve at hogger suction.....	Included
Hogging Ejector silencer.....	Included
Motive steam stop valve for each jet.....	Included
Pressure relief valve on each element.....	Included
*Measured at condenser inlet.	

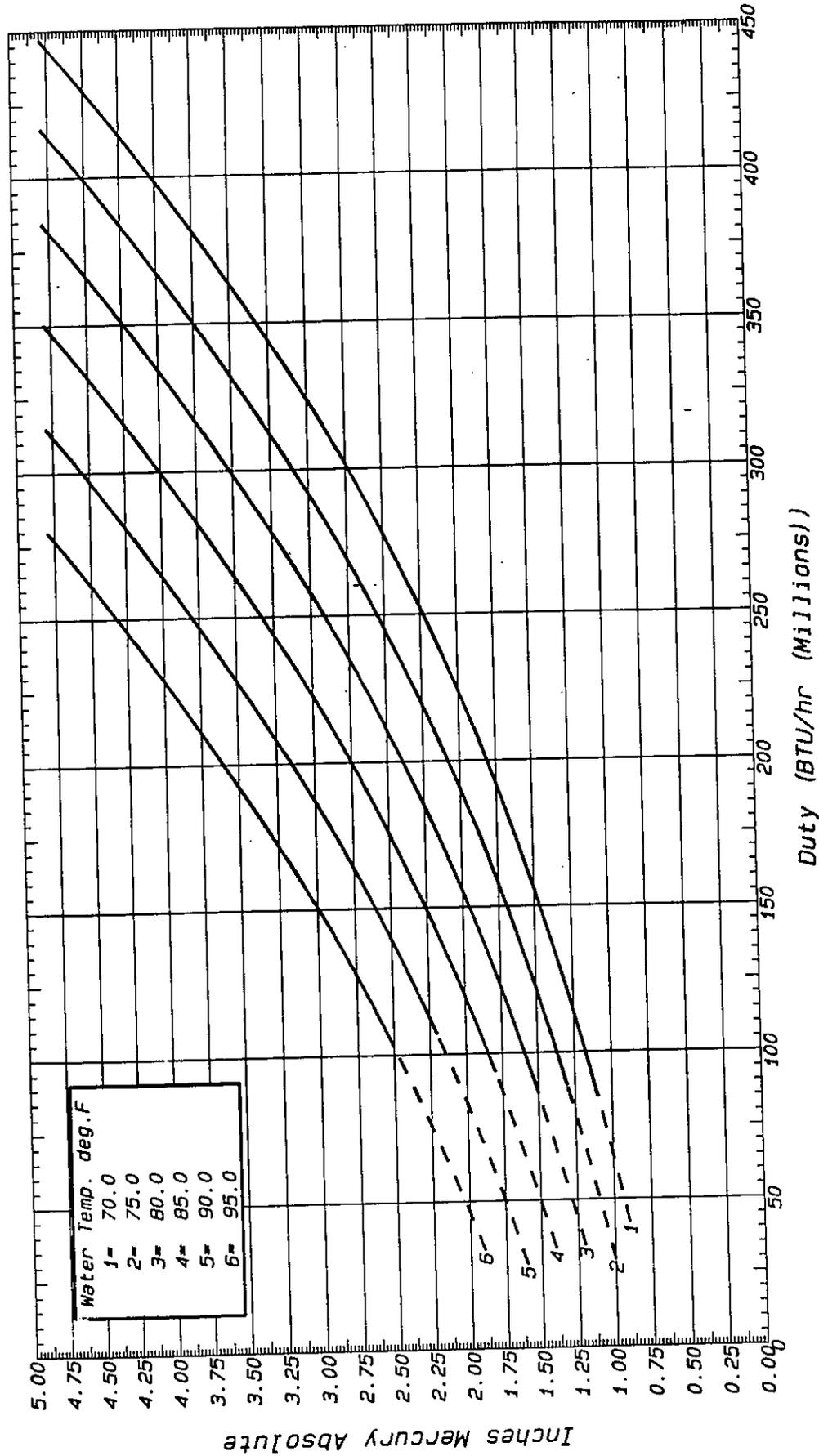
# PREDICTED CONDENSER PERFORMANCE

GRAHAM MFG. CO., INC.

Engineer: TLC

Dashed lines indicate less than HEI requirement of a 5 deg.F approach.

Surface Area (sq.ft.) 19348 EFF  
 Water Flow Rate (gpm) 21700.0



Water Temp. deg.F
1= 70.0
2= 75.0
3= 80.0
4= 85.0
5= 90.0
6= 95.0

Inches Mercury Absolute

Duty (BTU/hr (Millions))



# *Instruction Manual*

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4 Pole, 19700 KW, 21890 KVA, 0.90 PF, 1800 RPM, 13800V, 3 PH, 60 HZ

HORIZONTAL Synchronous Generator  
with Brushless Exciter and PMG

General Electric Canada  
Industrial Motor Business  
107 Park Street North  
Peterborough, Ontario  
K9J 7B5

Date: November, 1991



# BRUSHLESS SYNCHRONOUS GENERATOR CONTROL DATA SHEET

## RATING

Type... ATB... Poles... 4... KW... 19700... KVA... 21889... RPM... 1800... Volts 13800... Phases... 3...  
 Hz... 60... PF... 0.9... Amps... 916... Temperature rise... 80... °C by RTD/Resistance...  
 Overload... % for... Hours Driven by... Steam Turbine Through Gear...

## EXCITER FIELD DATA

Field amps at rated load... 4.0... Resistance at 25°C... 22.27... Ohms  
 Rated Excitation Volts... 121.6... Ceiling Volts... 180...  
 Minimum Field amps †... 1.2... Minimum Field volts (cold)... 26.7...  
 Overload field amps... Overload Field volts (hot)...

## REGULATOR DATA

Manufacturer... Basler...  
 Type... Auto/Auto SR9A with reactive droop, Excitation Limiter and UFOV...  
 Input Control Power from Shaft Mounted Permanent Magnet Generator...

## GENERATOR STATOR DATA

Stator amps at rated load... 916... Stator amps at overload...  
 Suggested temperature settings for protection equipment using embedded stator RTD's \*\*  
 alarm... 125... °C, trip... 130... °C

## SPECIAL DATA \*

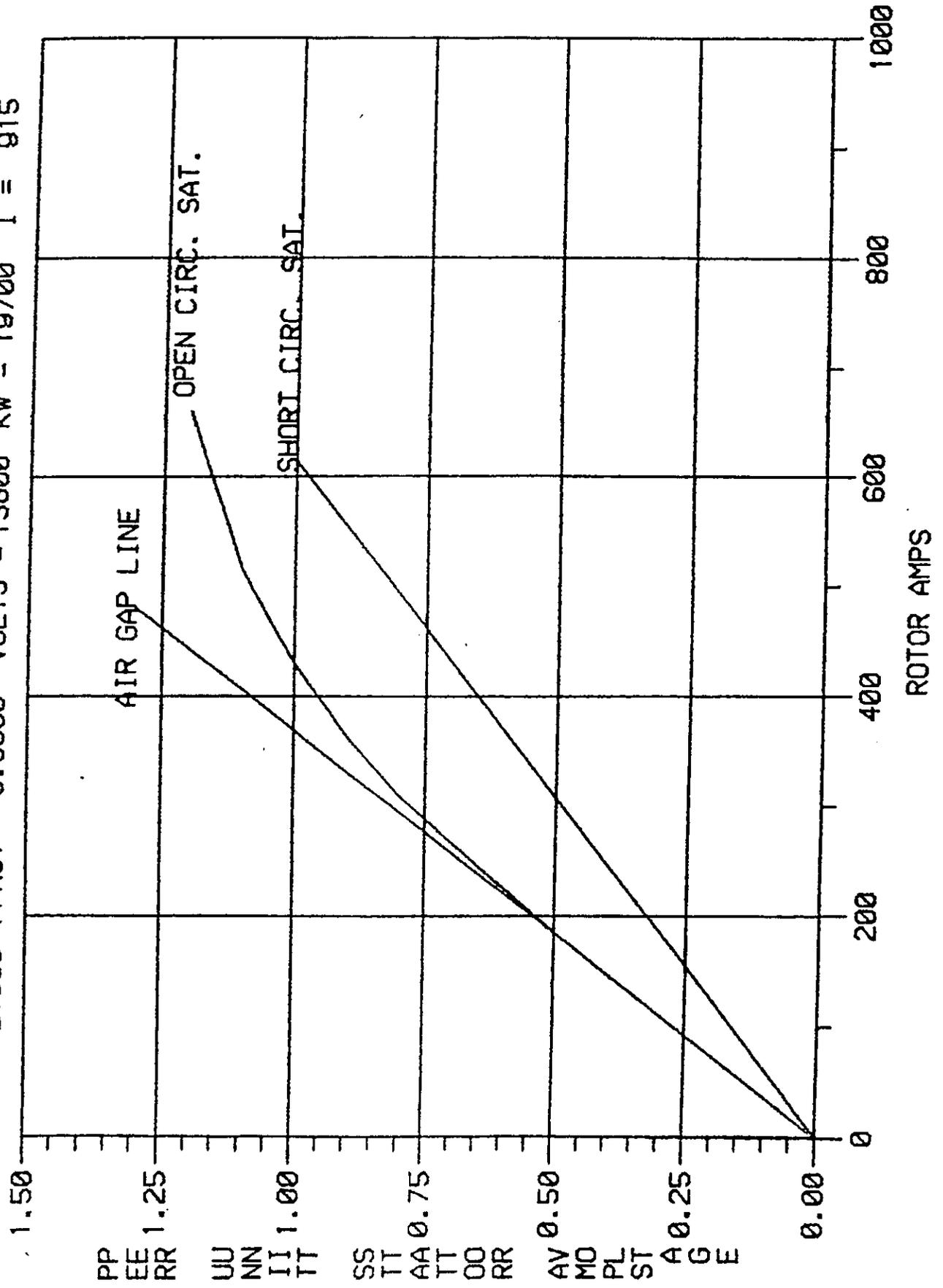
$X_d$ ... 1.56...  $X_d'$ ... 0.29...  $X_d''$ (sat)... 0.26...  $X_d'$ ... 0.20...  $X_d''$ (sat)... 0.18...  
 $X_q$ ... 0.87...  $X_q'$ ... 0.18...  $X_q''$ (sat)... 0.16...  $X_0$ ... 0.08...  $X_2$ ... 0.19... SCR... 0.70...  
 $T'd_0$ ... 7.4... sec  $T'd$ ... 0.93... sec  $T''d$ ... 0.027... sec  $\tau_{ao}$ ... 0.24... sec (25°C)  
 Open and Short Circuit Saturation Characteristics... 513HA141...  
 Rated Voltage "V" Curves... 513HA142...  
 Rated Voltage Reactive Capability Diagram... 513HA143...

Notes: † Minimum excitation volts is that required to give 80% rated AC volts at no load rated speed with cold field unless some other requirement is stated.  
 \* All reactances and time constants are for unsaturated conditions unless otherwise noted.  
 \*\* Based on 40°C ambient cooling air and temperature rise by RTD at full or S.F. load whichever is greater

Prepared by... W.J. Jackson/D. Derr... *[Signature]*

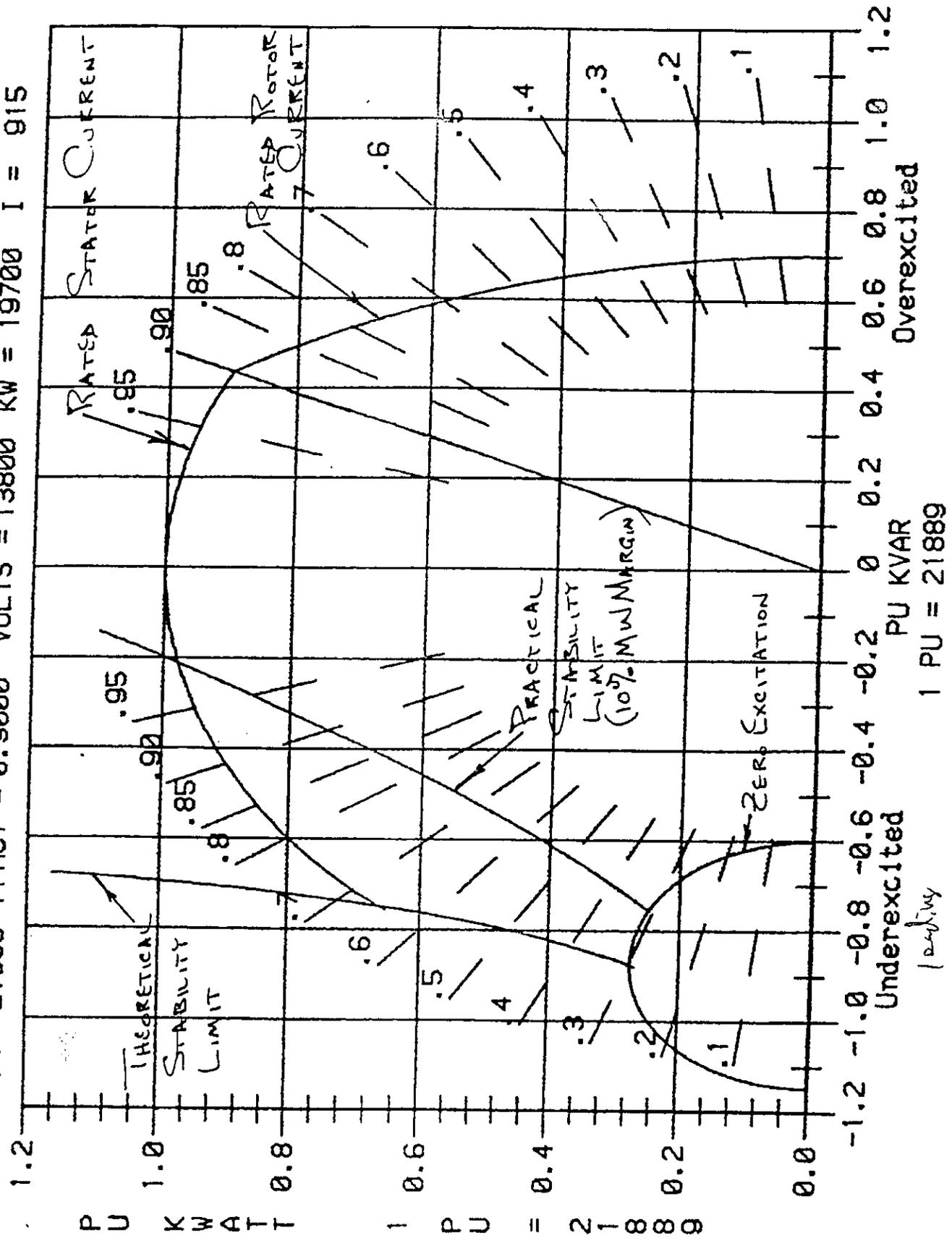
# CALCULATED OPEN AND SHORT CIRCUIT SATURATION CURVES

KVA = 21889 PFACT = 0.9000 VOLTS = 13800 KW = 19700 I = 915



# RATED VOLTAGE REACTIVE CAPABILITY DIAGRAM

KVA = 21889 PFACT = 0.9000 VOLTS = 13800 KW = 19700 I = 915



REV 51