

Nominal Performance Data

Introduction

This document describes the nominal performance for a SGT-600 in combined cycle operation for the Dazhou project in China.

Set Description

Gas Turbine	1 x SGT-600
Combustion Chamber	DLE combustion chamber and gaseous fuel capability.

Summary performance data

A summary of the nominal performance calculation is enclosed on the following pages.

SUMMARY OF GAS TURBINE PERFORMANCE DATA

 GTperform version : 2.4
 Project Name : Dazhou Wengfu, China
 Run date : 2010-03-11
 Gas turbine unit : SGT-600

Conditions

Altitude : 329 m above sea level
 Barometric pressure : 0.97435 bar
 Inlet pressure loss : 7.00 mbar
 Outlet pressure loss : 25.00 mbar
 Power turb. IGV angle : 27.00 degree(s)

Specified TBO: 40000 EOH

Fuel : Dazhou

LHV : 46865.0 kJ/kg
 Fuel Temp. : 25.0 °C (Ref. Temperature 25°C)

F U E L C O M P O S I T I O N

Component	Volume %	Component	Volume %	Component	Volume %
H2	0.027	CH4	97.113	C2H6	0.163
C3H8	0.017	H2S	0.002	CO2	1.892
N2	0.769	HE	0.017		

Special notes : GENERATOR DRIVE 50 Hz WITH GEAR
 Powerfactor : 0.90
 POWER TURBINE 7700 RPM

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Run results.

Run id	Amb. temp. C	R.H %	Load Case %	Output kW	el eff. %	Heat Rate kJ/kWh	Fuel flow kg/s	W/S ----	Exh. temp. C	Exh. flow kg/s
1	42.30	80.0	100.00	18418	30.82	11679	1.2750	0.000	559.74	68.33
2	40.00	80.0	100.00	18967	31.09	11580	1.3019	0.000	559.75	69.53
3	27.30	80.0	100.00	21504	32.22	11174	1.4242	0.000	552.83	75.52
4	20.00	80.0	100.00	22594	32.61	11039	1.4784	0.000	547.16	78.31
5	17.20	80.0	100.00	22912	32.69	11013	1.4956	0.000	545.60	79.14
6	10.00	80.0	100.00	23407	32.71	11006	1.5269	0.000	542.92	80.48
7	6.10	80.0	100.00	23652	32.70	11010	1.5435	0.000	541.80	81.12
8	-4.70	80.0	100.00	24338	32.60	11042	1.5928	0.000	539.43	82.90
9	-15.00	80.0	100.00	25011	32.47	11089	1.6439	0.000	537.81	84.65

EXHAUST GAS COMPOSITION

RUNID		SO2	H2O	CO2	N2	O2	Ar	He
1	% WT:	0.0001	8.276	4.909	70.845	14.76	1.206	0.000
1	% VOL:	0.0001	12.790	3.106	70.416	12.84	0.841	0.001
2	% WT:	0.0001	7.778	4.927	71.227	14.85	1.212	0.000
2	% VOL:	0.0001	12.056	3.126	71.004	12.96	0.848	0.001
3	% WT:	0.0001	5.823	4.963	72.714	15.26	1.238	0.000
3	% VOL:	0.0001	9.132	3.186	73.332	13.47	0.875	0.001
4	% WT:	0.0001	5.155	4.968	73.220	15.41	1.246	0.000
4	% VOL:	0.0001	8.116	3.202	74.137	13.66	0.885	0.001
5	% WT:	0.0001	4.964	4.973	73.366	15.44	1.249	0.000
5	% VOL:	0.0001	7.825	3.209	74.369	13.70	0.888	0.001
6	% WT:	0.0001	4.601	4.993	73.647	15.50	1.254	0.000
6	% VOL:	0.0001	7.268	3.228	74.819	13.79	0.893	0.001
7	% WT:	0.0001	4.465	5.007	73.754	15.51	1.255	0.000
7	% VOL:	0.0001	7.059	3.240	74.991	13.81	0.895	0.001
8	% WT:	0.0001	4.242	5.055	73.938	15.50	1.259	0.000
8	% VOL:	0.0001	6.716	3.277	75.286	13.82	0.899	0.001
9	% WT:	0.0001	4.162	5.109	74.016	15.45	1.260	0.000
9	% VOL:	0.0001	6.593	3.314	75.410	13.78	0.900	0.001

Exhaust Gas Heat Content (Q_{exh}) at Run id 5

 Q_{exh} = 38 941 kJ/s

h = 492,055 kJ/kg

 T_{ref} = 100°C

Exhaust gas composition at Run id 5

 Exhaust flow, 79.14 kg/s / 1.3 --> 60.877 Nm³/s --> 219 157 Nm³/h
 (the calculation is based on 1atm, 0 Deg C)

Parameter, Nm³/h

 SO₂, 0.219
 H₂O, 17 149
 CO₂, 7 032.7
 N₂, 162 984.9
 O₂, 30 024.5
 Ar, 1 946.1
 He, 2.19