

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

We reserve all rights in this document and in the information contained therein. Reproduction, use or disclosure to third Parties without express authority is strictly forbidden.
 © Siemens Industrial Turbomachinery AB

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