

<b>For Sale:</b>	<b>Pre-owned 200 MW Combined Cycle Gas Turbine Generator (Siemens V94.2 GT)</b>
<b>Ref.-No:</b>	<b>GT-CC-051</b>

## 1. General

A SIEMENS V94.2 GT (50 Hz) based CCGT (200 MWe) consisting of gas turbine generator, transformers, HRSG, steam turbine generator and auxiliaries. The CCGT unit was commissioned in 1992 for generating electricity and for supplying steam to industrial customer. The unit was commercially operated as of 1994.

## 2. Equipment Main Data

### 2.1. Gas Turbine

Type: Siemens V94.2  
Nominal power: 143 MW (15°C, 60% RH)  
Fuel: Dual Natural gas & Fuel oil

### 2.2. GT Generator: 3 phase, F insulation class, air cooled

Manufacturer: Siemens  
Type: TLRI 108/46  
Rated output: 185 MVA  
Rated voltage: 15.75 kV  
Rated power factor: 0.8

### 2.3. GT Step Up Transformer Manufacturer:

Ganz (Hungary) 1992 Type: DHM  
Rated output: 180 MVA Rated  
voltage: 132/15.75 kV

### 2.4. GT Unit Auxiliary Transformer

Manufacturer: Ganz (Hungary) 2005  
Type: HOTS 40000/17,5  
Rated output: 40/30/10 MVA Rated  
voltage: 15.75/10.5/6.3 kV

### 2.5. Boiler: The HRSG is a vertical boiler type with forced circulation manufactured by BORSIG. It has 1 pressure level, consisting of 4 heat exchanger: preheater, economiser, evaporator and superheater. There is no by-pass stack, therefore boiler runs in line with the GT.

Outlet steam parameters: 17 bar, 310°C, 303 t/h

### 2.6. Steam turbine: It was originally a 150 MWe condensate type STG with 3 casings. It was refurbished in 2005 by Alstom when the blades from HP rotor was removed, the power output was reduced to 60 MWe.

Original Manufacturer: HMZ (Harkov) Type:  
PVK 150  
Nominal power: 60 MW

### 2.7. STG Generator: 3 phase, B insulation class, hydrogen cooled

Manufacturer: Ganz  
Type: TVV 165-2  
Rated output: 176.5 MVA  
Rated voltage: 18 kV  
Rated power factor: 0.85  
Generator protection: Protekta DGBV-EP

### 2.8. STG Step Up Transformer

Manufacturer: Ganz (Hungary) (1963, refurbished in 2005) Type: DHFM 80000/120  
Rated output: 75 MVA  
Rated voltage: 132/10,5 kV

- 2.9. STG Unit Auxiliary Transformer Manufacturer:  
Koncar D&ST (2005) Type: TRP16000-12/A  
Rated output: 16 MVA Rated Voltage: 10,5/6,3 kV
- 2.10. STG Step up Transformer  
Manufacturer: Ganz (Hungary) Type: DHFM  
Rated output: 75 MVA Rated voltage: 132/10,5 kV



GT generator



GT



HRSG



Steam Turbine

### 3. GT Operating Data

Year	Number of starts	OH	EOH
1994		4 990	
1995		12 554	
1996		20 520	
1997		27 116	
1998		35 347	
1999		43 291	
2000		51 559	
2001	204	57 974	65 271
2002	217	66 166	73 831
2003	232	74 255	82 203
2004	242	82 415	90 535
2005	261	88 265	97 241
2006	276	96 053	105 398
2007	289	104 436	114 008
2008	300	106 021	115 769
2009	322	108 320	118 267
2010	349	110 443	120 558
2011	379	111 193	121 920
2012	416	113 019	124 313
2013	429	113 650	125 034
2014	441	114 101	125 654

### 4. GT Main Service Activities

1997: 1st Major Overhaul

- Standard MO scope including de-stacking of the rotor
- Replacement of stage 1-2-3 rotor blades and stage 1-2 stator blades

2001: 2nd Major Overhaul

- Standard MO scope incl. de-stacking of the rotor
- Replacement of stage 1-2 rotor blades and stage 1-2 stator blades
- Refurbishment of the Inner Casing (hub repair incl. heat treatment)

2005: Life Time Extension with upgrades at 96354 EOH

- Standard MO scope incl. de-stacking of the rotor
- LTE measures, condition assessment of main components
- Refurbishment of the Mixing Chambers and Inner Casing incl. heat treatment – No replacement by new ones
- No replacement of the compressor rotor blades, recoating of the relevant stages
- Replacement of stage 1-2-3-4 turbine stator blades and stage 3-4 divided seal rings
- Turbine section upgrade (pre-ratio => ratio): replacement of stage 3 and 4 discs and rings and rear hollow shaft and shaft seal casing, replacement of stage 3 and 4 turbine rotor blades
- HR3 upgrade: replacement of the Flame Tubes with new design for HR3 w/o dilution air openings, installation of new HR3 premix burners