

Ref. GT-CC-081

Combined Cycle GTPP for immediate delivery with full OEM Warranty.
Unique offer, complete Power Plant, fully erected but unused 810 (2 x 405) MW, full preservation and maintenance as per OEM instructions



CCPP Power Plant – 2 X 405 MW at ISO cond.

ASSET OVERVIEW

810 MW (2 x 405 MW, ISO), combined cycle power plant.

The project comprises of 2 identical streams of 1+1+1 configuration.

Each stream has one 9FA Gas turbine from GE, USA, one steam turbine generator from Alstom, Germany and one HRSG built by L&T along with associated auxiliaries and balance of plant.

The plant is designed to operate on Natural Gas.

The plant generation is at 15.75 KV stepped up to 400 KV for synchronization to the grid.

The plant was constructed by Larsen & Toubro Limited.

The plant was commissioned in Oct 2015 and is not in operation as there is no gas supply. It is currently under preservation as per OEM norms (GE, Alstom, L&T).

The units can be relocated at a suitable location within a period of approx. 24 months.

Owners have signed a Long Term Service and Parts Supply Agreement with GE for the Periodic maintenance and technical support for the Gas Turbines. They will also provide services for maintenance and spares supply for the Steam Turbines.

All plant and equipment will get warranties and guarantees for performance from respective OEM's.

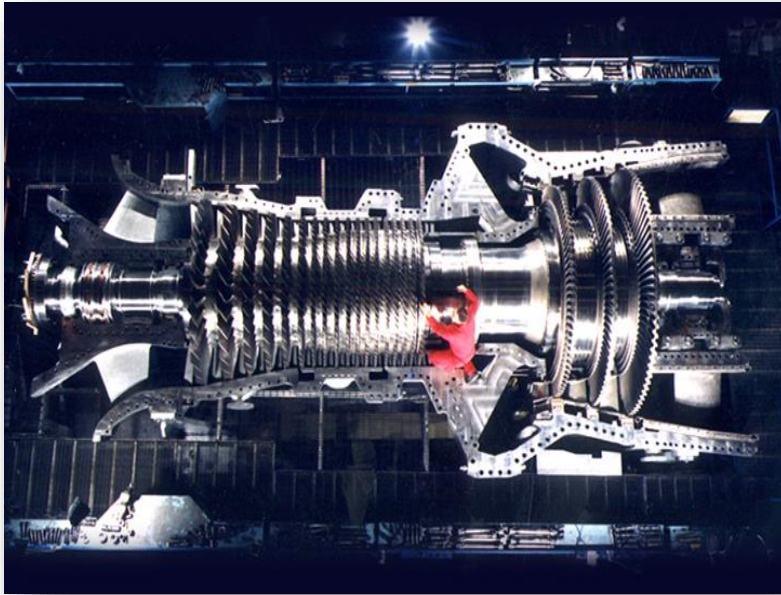
Optional Features

Features	
Plant Capacity	<p>2 X 405.40 MW at ISO conditions.</p> <p>2 X 383.78 MW at site conditions.</p> <p>Gross Heat Rate – 1515 Kcal/Kwh on LHV basis at ISO conditions.</p> <p>Auxiliary power consumption < 3%.</p>
Fuel requirement:	Natural Gas ~ 1.64 mmscmd at 9500 Kcal/scm, HHV at site conditions.
Water Consumption	25000 cu.m per day.
Emission Limits	Provided with Dry Low NOx burners with NOx and CO limits as 35 ppmv & 15 ppmv @ 15% O2 resp.
Supplementary Duct Firing	33 MW capacity.
Start up and Controls	<ul style="list-style-type: none">• Islanding capability to meet the house load.• Capable to reach full load in 90 min. under hot conditions.• Possible to start GT from local as well as remote.• Capable of quick response to unscheduled demand.
Gas Turbine Running Hours	<ul style="list-style-type: none">• Unit #1 -2790 Fired hours. (Hot Gas Path Inspection at 24000 hrs. & Major inspection at 48000 hrs.)• Unit #2 -1547 Fired hours. (Hot Gas Path Inspection at 24000 hrs. & Major inspection at 48000 hrs.)

Major Equipment

Sl. No.	Equipment	Capacity
1	Gas Turbine	2 x 240 MW
2	Gas Turbine Generator	2 x 214 MVA, 0.80 P.F lag
3	Steam Turbine	2 x 144 MW
4	Steam Turbine Generator	2 x 169.65 MVA, 0.85 P.F lag
5	HRSB	2 No. Vertical, Triple pressure , Reheat type
6	Power Transformer for GTG	2 x 277 MVA
7	Power Transformer for STG	2 x 170 MVA
8	Unit auxiliary transformer	2 x 28 MVA
9	EDG	2 X 1.01 MVA
10	CW pump	4 X 14260 m ³ /hr.
11	Condensate Extraction pump	4 X 570m ³ /hr.
12	HP/IP Boiler Feed Pump	4 X 410 m ³ /hr.

Major Equipment Features



GE PG 9351 FA with DLN2.0+

Heavy duty 9FA gas turbines from the experienced F class fleet with over **25 million hours of operation.**

Features

- Enhanced 24K hardware for increased reliability and availability.
- Cooling Optimization for improved power output and base load efficiency through better management of turbine section clearances and cooling air flows.
- Mark VIe Control System controls the gas turbine using real-time physics based modeling, increasing the overall performance, operability, and reliability of the gas turbine.

Gas Turbine

Capacity	240 * MW (at site conditions). 257 MW at ISO conditions
Fuel	Natural Gas
Starting Means	Load Commutated Inverter (LCI)
Air Filtration	Self-Cleaning
Inlet Air Cooling	Evaporative Cooler
Compressor Cleaning	On-line and Off-line Water Wash
Exhaust System	Exhaust Diffuser with Expansion Joint for Axial Exit
Emissions Control	Dry Low NOx 2.0+

Gas Turbine Generator

Rating	314 MVA hydrogen cooled
Frequency	50 Hz
Cooling	Hydrogen
Power Factor (pf)	0.80 Lagging, Capability to 0.95 Leading
Terminal Voltage	15.75KV
Generator Excitation	Digital Static Bus Fed

Major Equipment Features



Alstom – Steam Turbine and Generator

Features

- Turbine:- 2 casing , condensing steam turbine model - HD1CK+MDG160/NE37AA
- Sliding pressure operation.
- Manufactured at Alstom Germany
- 100% bypass capability for HRH /LP.
- Max. inlet temp.= 566 ° C .

Steam Turbine

Make ALSTOM

Capacity 144 * MW

Main Steam Parameters

- HP Steam: 296.5 T/hr. @ 141 Bar, 568 Deg C
- IP Steam: 339.3 T/hr. @ 34 Bar, 568 Deg C
- LP Steam: 33 T/hr. @ 4.4 Bar, 287.4 Deg C

Steam Turbine Generator

Rating 169.65 MVA

Frequency 50 Hz

Power Factor (PF) 0.85 Lagging

Terminal Voltage 15.75KV

Cooling Air Cooled

Major Equipment Features



Heat Recovery Steam Generator (HRSG)

Supplier – L&T , Design - CMI

Vertical, Triple pressure , Reheat type HRSG with supplementary duct firing.

Water Circulation:-

HP :- Forced circulation – Pump capacity – 1030 M³/hr.

IP :- Natural Circulation

LP :- Forced Circulation – Pump Capacity – 60 M³/hr.

Make	CMI Design			
Type	Triple Pressure HRSG installed at the exhaust of the Gas Turbines			
Steam Parameters	Unit	HP	IP	LP
- Steam generation	kg/sec	82.377	94.25	9.18
- Pressure	Bar (a)	141.01	33.95	4.37
- Temp.	°C	567.5	568	287.4

Major Equipment - Electrical



Power Transformer GTG

Rating	3 phase/ 277 MVA, 0.85 P.F lag
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Voltage	15.75/420 KV
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Cooling	ONAN/ ONAF/OFAF
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Frequency	50 Hz
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Unit Auxiliary Transformer -

Rating	3 phase/ 28 MVA
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Voltage	15.75/6.9 KV
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Cooling	ONAN/ ONAF
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Frequency	50 Hz.
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Power Transformer STG-

Rating	3 phase/ 170 MVA, 0.85 P.F lag
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Voltage	15.75/420 KV
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Cooling	ONAN/ ONAF/OFAF
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Frequency	50 Hz
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Major Equipment - BoP

BALANCE OF PLANT:

DM PLANT	2x20 m ³ /hr. capacity. Triveni Engineering Ind. Ltd.
Induce Draft Cooling Tower	L&T Double row multi cell with total 20 cells serving both units. Circulation Flow – 57040 M ³ /hr.,
Gas Conditioning System	Manufacturer - Gastech Process Engineering. Design flow- 109.17 TPH, Max. Supply press- 45 bar
HP/IP BFP	Electric driven pump with a variable speed hydraulic coupling. Manufacturer – KSB Pumps. HP/IP flow – 330/80 M ³ /hr at 163.36/46.18 Bar.
CW Pumps	Vertical mix flow pumps., Manufacturer – Kirloskar Brothers Ltd. 4 X 14260 M ³ /hr. at 2.2 bar
400 KV Switchyard	SAS with Energy Management system. Conventional 1 ½ breaker scheme, 80 MVaR Bus Reactor, SCADA system.
DCS	Centum VP, Yokogawa.

