Technical details

116 MW Gas based Combined Cycle Power Plant

Brief Introduction

- The Project is a 116 MW Combined Cycle Gas based Power Plant located in Eastern part of India which is fully erected and ready for commissioning by 2013.

- The nearest Port to the Plant is Kakinada Sea Port, which is about 85 Kms and well connected by road network from the plant site for transporting the equipment.

- Project is designed by a German Company Fichtner from its Indian office. All the Major equipment are procured from internationally reputed suppliers such as GE, Shin Nippon, Thermax, Alstom, Mather and Patt, Spig etc with advanced technology. The plant configuration, list of suppliers, design parameters etc are given in the below slides.

- The Project is Stranded due to Non-Supply of Gas by Government of India (GoI) from domestic source. All the critical equipment are well preserved under the guidance and periodical supervision of OEMs.

Technical Description of the Plant

Plant Configuration

Configuration	1GT + 1 HRSG + 1 ST
Gas Turbine Model Number	GE, 6FAG
Gas Turbine Output at ISO Conditions	78.595 MW
Gas Turbine Output at Site Conditions	71.727 MW
HRSG Model	Unfired
Gross Combined Cycle Output	116 MW (At ISO)
GT Gross LHV Heat Rate	10216 kJ/kWh
Gross Combined Cycle Heat Rate [Conversion 1 kJ = 0.239006 kcal/kWh]	6838 kJ/kWh [1634.3 kcal/kWh]
Steam Turbine Output	37.6 MW
LHV Gross Efficiency [860 (Kcal required to Generate 1 kWh] /1634.3 = 52.65%]	52.65%

Parameters used for Plant Design

Measurement	Unit	Value
Site Altitude	m	31.5
Site pressure	mbar	1013
Ambient dry-bulb temperature	℃	29
Ambient relative humidity	%	70
Grid Voltage	kV	220
Grid Frequency	Hz	50
Power factor: 0.8 lagging, 0.95 leading (subject to details from vendor)		

Technical Specifications

Fuel	Natural Gas
Gas Turbines	General Electric, Type 6FAG, Axial Exhaust, Gas Turbine Generators: Brushless, 50 Hz, Starting Static frequency converter, By pass stack Generator Enclosure: Outdoor with Acoustic Enclosure Compressor Cleaning: Off-line Compressor Water Wash Operating Mode: Base Load
HRSH	2 Pressure systems, Unfired, Natural Circulation, Outdoor
Steam Turbine	Condensing, Double Flow Exhaust -Axial Exhaust, Generator: Static or Brushless, 50 Hz, Enclosure: Indoor
Main Cooling System	Closed loop cooling water system Using an Induced Draught Cooling Tower, Dematerialised Water System
Switchyard	220 KV, 50 Hz
Plant Control Philosophy	Automatic Start-up & Shutdown, Auto/Manual Control Remote Dispatching

Gas Specifications

Constituent	Minimum Percent by Volume	Maximum Percentage by Volume
Methane (CH_4)	85.0	100.00
Ethane (C_2H_6)	0	6.00
Propane (C3H8)	0	5.00
Butane (C3H8)	0	3.00
Pentane (C5H12) and higher	0	2.00
Hydrogen Sulphide (HS2)	0	0
Carbon dioxide (CO2)	0	2.00
Nitrogen	0	3.00
Oxygen (O_2)	0	1.00
Inert (the total combined Nitrogen, Oxygen, Carbon dioxide and any other inert compound)	0	5.00

Major Equipment Details

EQUIPMENT	VENDOR	COUNTRYOF MANUFACTURING	TECHNOLOGY
GAS TURBINE	GENERAL ELECTRIC	BELFORT CADADEX, FRANCE	USA
STEAM TURBINE	SNM	JAPAN	JAPAN
	TDPS	INDIA	JAPAN
HRSG	THEMAX	INDIA	INDIA
BOILER FEED WATER PUMPS	ABB	INDIA	SWITZERLAND
STEP UP TRANSFORMERS	TOSHIBA(VIJAY ELECTRICALS)	INDIA	USA
	TOSHIBA(VIJAY ELECTRICALS)	INDIA	USA
	TOSHIBA(VIJAY ELECTRICALS)	INDIA	USA
	TOSHIBA(VIJAY ELECTRICALS)	INDIA	USA
	TOSHIBA(VIJAY ELECTRICALS)	INDIA	NEWYORK,US
GENERATOR CIRCUIT BREAKER	ALSTOM	FRANCE	FRANCE
MV SWITCHGEARS	SCHNEIDER ELECTRIC.	INDIA.	FRANCE
	SCHNEIDER ELECTRIC.	INDIA.	FRANCE
	SCHNEIDER ELECTRIC.	INDIA.	FRANCE
	SCHNEIDER ELECTRIC.	INDIA.	FRANCE
GAS COMPRESSORS	GENERAL ELECTRIC	BELFORT CADADEX, FRANCE	BELFORT CADADEX, FRANCE
STEAM BYPASS VALVES	MIL (KSB)	INDIA	INDIA
FIRE PUMPS	MATHER & PLATT	INDIA	GERMANY
	MATHER & PLATT	INDIA	GERMANY
	MATHER & PLATT	INDIA	GERMANY
	MATHER & PLATT	INDIA	GERMANY
	MATHER & PLATT	INDIA	GERMANY
COOLING TOWER	B&W SPIG	ITALY	ITALY
AIR COMPRESSOR	INGRESSOL RAND	IRELAND	IRELAND
CRANE AND HOIST	GRIP ENGINEER PVT LTD	INDIA	INDIA
	GRIP ENGINEER PVT LTD	INDIA	INDIA
	GRIP ENGINEER PVT LTD	INDIA	INDIA
ISOLATED PHASE BUS	GE (ALSTOM)	INDIA	FRANCE
	GE (ALSTOM)	INDIA	FRANCE
UNIT AUXILIARY TRANSFORMER	TOSHIBA(VIJAY ELECTRICALS)	INDIA	USA
DISTRIBUTED CONTROL SYSTEM	GE (ALSTOM)	INDIA	FRANCE
FUEL GAS SYSTEM	NIRMAL INSDUSTRIES CONTROLS PVT LTD	INDIA	INDIA