Moscow TPP-26 combined-cycle CHP plant

The TPP-26 Unit 8 combined heat and power (CHP) plant being built in Moscow for Mosenergo will be the first power plant to be built by a major Western European company, namely Alstom under a turnkey engineering, procurement and construction contract.

The design of the cogeneration plant is based on an Alstom KA26-1 combined-cycle power plant in multi-shaft arrangement, delivering 420 MW and up to 265 MW thermal for district heating. The KA26-1 multi-shaft design will provide the CHP plant with the necessary flexibility to perform in various operating modes.

The single combined-cycle block features a GT26 gas turbine, with a heat recovery steam generator and a STF30c steam turbine, each powering a dedicated air-cooled TOPAIR generator. The GT26 will burn natural gas, with liquid fuel as the backup. The NOx and CO emissions from the plant will be well below the maximum permissible levels.

Once completed, the plant will have an electrical efficiency of 59 per cent, which is the highest efficiency of any Russian combined-cycle power plant. Furthermore the additional use of the steam to provide district heating means the overall fuel utilization of the plant is in excess of 85 per cent. This high operational efficiency is expected to reduce gas usage by 30 per cent compared to existing plants in the country.

TPP-26 Unit 8 CHP plant, which is scheduled for handover in 2009, is expected to set a benchmark in efficiency for all future combined-cycle plants in Russia, and may herald in a new era of co-operation between Russian operators and foreign original equipment manufacturers.

Moscow TPP-26 combined-cycle CHP plant: key components

Configuration	multi shaft, one gas turbine plus one steam turbine
Power plant installed capacity (MW net)	428
Steam extraction (t/h)	40t/h, 13 bar, 250ºC
Efficiency (%)	59
NOx emissions (mg/Nm3*)	50 – fuel gas, 100 – fuel oil
Ambient temperature (°C)	-42 to + 37
Average temperature, design (°C)	-3.1
Ambient rel. humidity (%)	77
Ambient pressure (bar)	0.995

Gas turbines

Number	1
Type	GT26
Fuel	Dual fuel
Exhaust temperature (deg C)	625

Steam turbine

Number	1
Type	STF30c
Output (MW)	146
Live steam flow (kg/s)	89
Live steam pressure (bar)	136
Live steam temperature (°C)	565
Reheat steam flow (kg/s)	100
Reheat steam pressure (bar)	29
Reheat steam temperature (°C)	565

Generators

Number	2
Type	TOPAIR
Voltage	15 kV, 19 kV
MVA	225, 315

Heat recovery steam generators

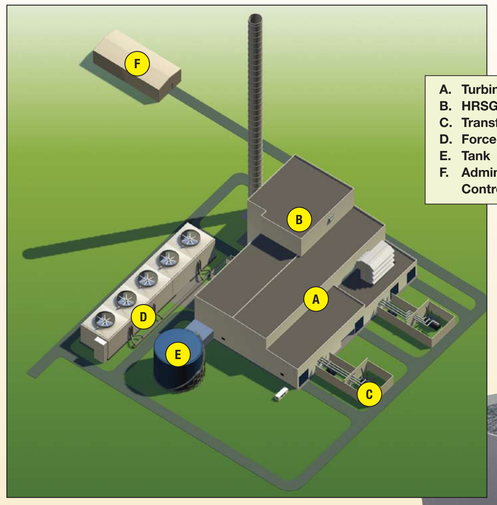
Number	1
Type	3 pressure reheat, with once through HP evaporator, 15 module design, no bypass stack
Stack height	120 m (derrick type steel structure)

Condenser

Tubing	Duplex
Pressure (mbar)	29

Main cooling water system

Type	cell type forced draft cooling tower
Length (m)	85
Number of cells	5



A. Turbine hall
B. HRSG
C. Transformer
D. Forced draft cooling tower
E. Tank
F. Administration building/ Control room & warehouse

1. GT26 gas turbine
2. TOPAIR turbogenerator
3. Air intake
4. STF30c Steam turbine
5. Condenser
6. Heater for District Heating
7. GT main transformer
8. ST main transformer
9. Bus duct
10. HRSG
11. Exhaust stack
12. Overhead crane
13. Feedwater tank
14. Dearator

Simplified flow diagram

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