

Castelnou, Spain

**800 MW**



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## A 800 MW Combined Cycle for Castelnou Energia S.L (Electrabel)

### Description Project

In the early years of the 21st century, Spanish energy in the wake of deregulation required the building of environmentally benign generating plants. As a result combined cycles were the main elements of a construction program of new capacity to meet a demand for 3600 MW/year up to 2010.

The Castelnou combined cycle is a 800 MW plant sited near the town of Teruel, some 120 km northeast of Valencia. It provides a catalyst for the region's economic development. The developer was Electrabel Spain, a subsidiary of Electrabel Belgium, as single shareholder in Castelnou Energia, owner and operator of the power station.

The power plant is based on two Mitsubishi M701F gas turbines and a 260 MW steam turbine. The HRSGs are of triple pressure plus reheat designed by John Cockerill.

This is the fifth combined cycle in the Spanish program for which John Cockerill has supplied HRSGs. The power station of Castelnou entered in service in the first quarter of 2006.

### The Contract

Mitsubishi awarded the contract to John Cockerill Energy for two HRSGs in December 2003. As with our other Spanish projects the boilers were designed in Belgium and fabricated in Korea and Romania under supervision of John Cockerill advisors. Erection was out of John Cockerill's scope of work and was undertaken by Spanish companies under supervision of John Cockerill.

### Plant Operation

HRSGs are designed for semi base load and cycling operation (two shift duty with daily start-up).

### Gas Turbine

- GE 9FA
- Fuel: natural gas
- Diesel oil as backup

### Heat Recovery Steam Generator

- Mitsubishi M701F, ISO rated 270.3 MW
- Site rated 250 MW at 30°C
- Fuel: natural gas

### Heat Recovery Steam Generators

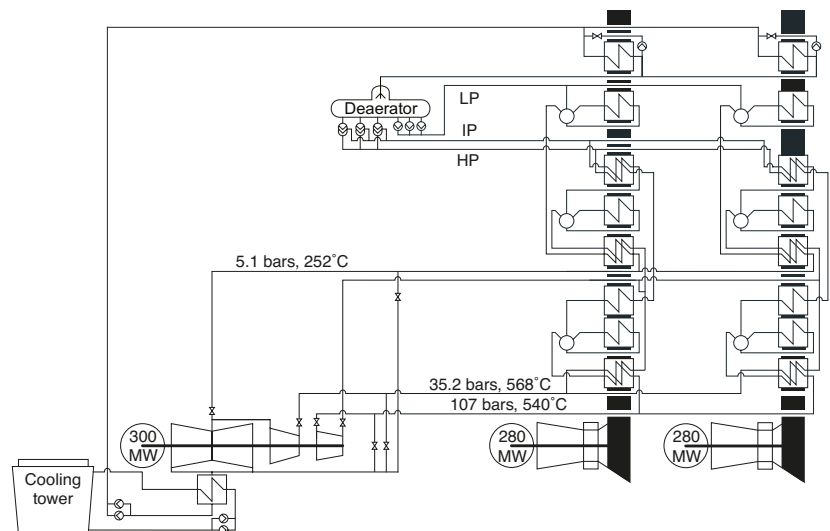
- John Cockerill vertical, natural circulation design, unfired
- Three live pressures to steam turbine
- No bypass stack
- Full flow bypass to condenser from each pressure level

### Performances

| GAS    | °C  | kg/s  |       |
|--------|-----|-------|-------|
| Inlet  | 599 |       | 644   |
| Outlet | 105 |       | 644   |
| STEAM  | °C  | barA  | t/h   |
| HP     | 540 | 124.4 | 271.3 |
| IP     | 283 | 37.5  | 46.4  |
| LP     | 250 | 6.4   | 41    |
| REHEAT | 568 | 35.9  | 310.5 |

### Schedule

- Contract Award December 2003
- Start of boiler erection November 2004
- Commercial Operation January 2006



## CMI becomes John Cockerill