

Castleford Power Station

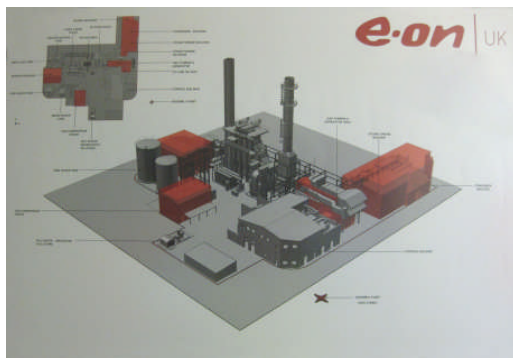
The **E.ON Castleford** facility is a stand alone Combined Cycle Gas Turbine (CCGT) Power Station within the wider E.ON portfolio supplying electricity to the National Grid.

The plant incorporates a General Electric Model LM6000PD Gas Turbine, Waste Heat Recovery Boiler and 13 MWe Condensing Steam Turbine

The site was commissioned in October 2002 as a 56 MWe combined heat and power plant to supply the electrical and steam requirements of a chemical intermediated manufacturing facility. It was later reconfigured for its present role in 2005.



The Application



As a supplier to the National Grid it is advantageous for E.ON to have the capability of being able to shut down the power station and start-up up as required for flexible operations in response to market conditions. To achieve this E.ON needed a separate high pressure steam supply that could be made available in an instant to feed the glands on the steam turbine - long before the main Waste Heat Recovery Boiler became available. This instant steam would allow vacuum conditions to be established on the steam condenser and significantly reduce the time to synchronisation of the gas and steam turbines.

E.ON's strict specifications for this application required a steam boiler that would produce a large amount of high pressure steam but which was compact in size to fit within the existing process area. In addition, the steam boiler to be selected had to be extremely reliable since it would have to be available as, and when, it was needed as short notice.

The Solution

After extensive research E.ON finally selected the Clayton Steam Generator System which met the specification in full and is of a proven design. The main features that make it ideal for this application are small size, rapid start capability from a completely cold condition and safety in operation. In addition the Clayton Steam Generator is automatic and it can be started and stopped remotely.

The complete Clayton Steam System was supplied as a modular plant and positioned on the existing concrete base. A weatherproof enclosure was then built around the equipment and the system was integrated into the existing process. The modules are the Clayton Steam Generator, Feedwater Treatment Skid and Feedwater Booster Pump. The Feedwater Treatment Skid includes the Horizontal Hotwell, Water Transfer Pumps and Blowdown Tank piped and wired to form a packaged water system.



The Clayton Steam Generator is of an advanced design which includes plc control as well as modbus communication that is linked to the modern control room at the power station. Running information messages as well as the main operating parameters are indicated on the Steam Generator control panel front display screen. Settings can also be checked and adjusted by keys on the display. Security levels are password protected.



Experience

The Clayton Steam System has been found to be extremely reliable and low in maintenance. The operational history has been excellent and the system can be called upon to run daily weekly or on demand whenever required.

The installation is a credit to Clayton's innovative approach to technology and reliable engineering.



Steam Generator Specification

Model	:	EG-354-5
Year of Supply	:	2005
Design Pressure	:	30 barg
Steam Output	:	5480 kg/h
Water – Filled	:	777 litres
Water - Operating:	:	380 litres
Length	:	2745 mm
Width	:	1950 mm
Height	:	3490 mm
Weight	:	2915 kg

E.ON are one of the UK's leading integrated power and gas companies – generating and distributing electricity, and retailing power and gas – and are part of the E.ON group, the world's largest investor-owned power and gas company

E.ON generates 10 percent of the UK's electricity and is involved in every link of the energy chain, producing electricity from a portfolio of world-class power stations and researching new technologies to meet the needs of their customer base.

E.ON are also one of the biggest names in combined heat and power, with 13 sites across the UK from Kent to Cumbria and also own and operate one of the UK's leading green generation businesses. Producing enough green power to supply the homes of a city the size of Manchester, their renewables portfolio is made up of 21 operational wind farms and an extensive biomass co-firing programme.

Footnote

The other power stations where Clayton Steam Generators are used for the same gland sealing application include, Electrabel Drogenbos Power Station, Cogentrix Sterlington Power Station, Scottish & Sothern Medway Power Station, Transalta Campeche Power Station, Cogentrix Jenks Power Station, Manx Pulrose Power Station and SPE Stag Power Station.