Marina

Gas Power Station

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About Marina

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About ESB Power Stations

ESB power stations are classified as either thermal or hydro. Thermal stations convert the chemical energy in fossil fuels into electricity by burning coal, gas, oil or peat. Hydro stations convert the potential energy in water at a height into electricity by dropping the water through turbines to a lower level. Increasingly electricity is being generated from alternative sources such as wind and biogas.

Types of ESB Power Station

- C Coal
- P Peat
- G Gas
- O Oil
- H Hydro
- R Renewables (other than Hydro)

Introduction

Marina Generating Station is a major landmark building close to the centre of Cork City. It has a total electricity generating capacity of 115 megawatts (MW). The plant started it's life as a coal fired station when it was initially opened in 1954 but the discovery of natural gas off the southern coast of Cork in 1978 means that it now operates as a modern, natural gas fired, combined cycle plant.

Operating 24 hours a day, seven days a week, the Marina plant contributes almost one million megawatt hours of power annually towards the ongoing electricity requirements of the country.

A brief history

Electricity was generated for the first time in Cork in December 1898 from the powerhouse in Albert Road. The London registered company; Cork Electric Tramway & Lighting Co. Ltd. successfully tendered for the undertaking. By 1900 the consumption of electricity in Cork City was 1,000 MWHs (megawatt hours) a year.

Industrial growth was slow at the start of the century and electricity demand reflected this. Still, the growth of the city's electricity requirements was continuous, with demand expanding from 2,000 MWHs in 1906 to 8,000 MWHs in 1928.

In 1927 the Electricity Supply Board Act was passed to set up the Electricity Supply Board (ESB), a corporate body to control and develop Ireland's electricity network. The Cork Tramway Company was one of approximately 300 suppliers taken over by ESB.

It became apparent by about 1940, that the ESB system required a larger input from the Cork area. A decision to proceed with the construction of the station was delayed until 1947 by the war. The site for the station was chosen at Marina, on the south bank of the River Lee, just downstream from the Ford and Dunlop factories. It was an ideal site for ESB as there was already good road access and an existing wharf, which facilitated the unloading of both coal and oil. The station was designed by ESB staff and was commissioned in early 1954.

The original development of three Babcock and Wilcox boilers and two 30 MW Siemens turbo generators was at the time, the largest in Ireland with an annual estimated output of 240,000 MW hours and fuel consumption of 80,000 tonnes of oil, or 180,000 tonnes of coal. The station was extended by a further 60 MW unit in 1964. In 1979, following the discovery of natural gas in the Kinsale gasfield, the existing plant was converted to gas fired burners and continued burning gas until the original boilers were decommissioned in the early 1980's and the 60 MW unit mothballed in the late 1980's.

To further exploit the advantage of natural gas, a new highly efficient Combustion/ Steam turbine combined cycle was built and commissioned in 1979. This exciting development brought Marina to the forefront of power technology. The General Electric designed and Alsthom built, MS9001B gas turbine was the first of it's kind to be installed in combined cycle.

The challenge at the time was to combine the pre World War 2 manufactured

Siemens Turbines with modern state of the art combustion turbine technology.

Presently, the Siemens unit is getting a further lease of life that should see it operate well into the new millennium.

The Marina combined cycle operation, despite its 120,000 hours of service, is set, by means of judicious maintenance and change-out policies, to continue to operate as an important base load unit into the foreseeable future at Generated Thermal Efficiencies in excess of 42 percent.

A highly skilled workforce, trained in the various disciplines of plant operation, engineering, maintenance, administration, laboratory and technical services, staffs the station.

How Marina makes electricity

Marina is designed to generate electricity from the products of the combustion of natural gas at a very efficient rate. The gas turbine is similar to a very large jet engine, which burns natural gas in a mixture with compressed air. Both are at high pressures with a firing temperature of 1,050°C. The energy from this combustion turns the moving blades of the turbine, which is coupled to a generator, at a speed of 3,000 revolutions per minute. The relative motion of a large electromagnet in the generator allows 85 MW's of electricity to be generated at 10,500 volts. To support efficient distribution of the power, the voltage, by way of a transformer, is stepped up to 110,000 volts.

The generation of electricity at Marina doesn't end there. The exhaust gases from the gas turbine still retain sufficient energy to produce high pressure and temperature superheated steam in a Heat Recovery Boiler. This steam is then directed to a Siemens Turbo-Generator where a further 30 MW's of power is produced.

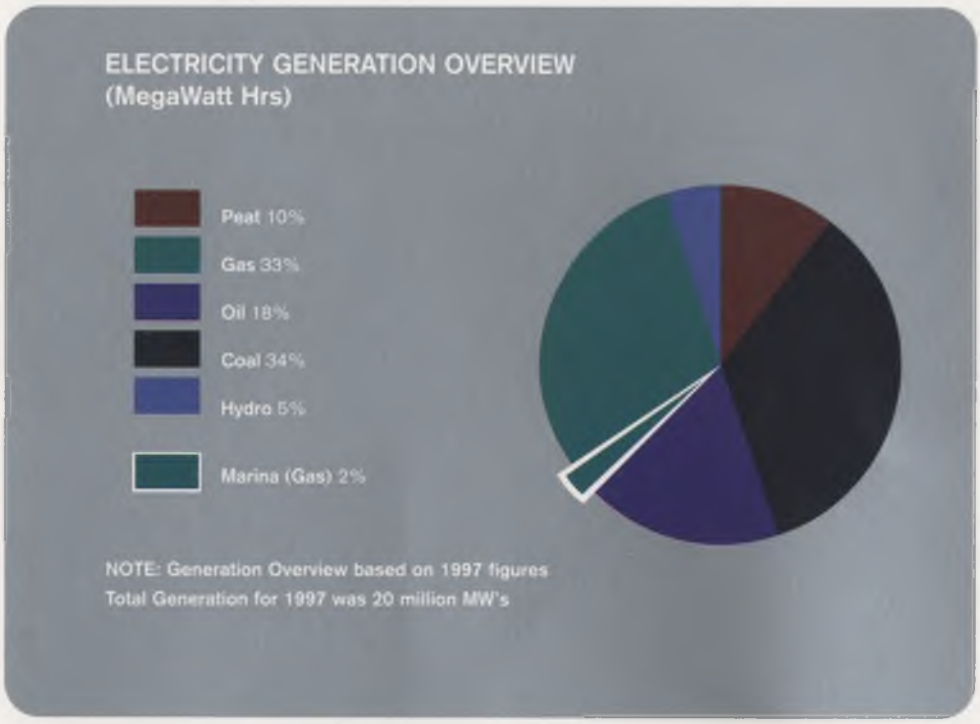
Care for the environment

Marina Generating Station, with its current technology, including a highly efficient gas burning combustion turbine, is at the forefront of environmentally friendly power producers. Burning natural gas produces no sulphur dioxides or smoke and the high thermal efficiency means that carbon dioxides are at a minimum.

The station continues to actively promote good environmental management practises and is mid-way through a programme of improvements with this aim in mind. The

Top
Main Control Centre
Centre left
Plant Inspection
Centre right
30 MW Steam Condenser
Bottom
30 MW Turbo Generator

G Marina



station has recently launched the Marina Environmental Management Group (EMG). This group, with the help of all staff, will assist in ensuring that the necessary environmental procedures and activities are identified, monitored and reviewed on an ongoing basis.

Marina has gained a significant reputation for its commitment to the environment by both internal and external agencies and has recently won the prestigious "Tidiest Industrial Site" award from Cork Corporation, over two consecutive years.

Role within the local economy

Marina station has been an integral part of the local community since its original commissioning back in 1954. The station currently burns in excess of £15 million worth of natural gas each year. As such, it is a major customer of Bord Gais and ultimately to the Cork gas field.

In payroll terms, Marina contributes over £3 million to the local economy of Cork City and the surrounding environment. With an annual spend of £2/3 million on materials and outside services it makes a significant contribution to the success and prosperity of business, both local and national. Along with its sister station in the east of Cork, Aghada, Marina provides locally embedded power to the fast expanding industry base of the Cork Harbour area.

Role within the local community

The management and staff at Marina have long recognised the central role that they play in the affairs of the local community and the social responsibilities they have to the community that supports them. Although the station is located in an industrial area of Cork City, Marina takes its social responsibilities very seriously.

The station, through staff representation, is a strong supporter of charity and civic organisations, as well as local sports clubs. Management and staff retain a close involvement with retired staff and this encourages lasting friendships.

The old Albert Road premises that remained in use as part of Cork District, until the new headquarters in Wilton were opened, continues to be associated with the life of the city and now houses a flourishing group of artists.

Visitors

Since its opening Marina has gladly facilitated visits by schools, third level colleges and organised groups. While visits are continued to be welcomed it is essential that these are in small groups and arranged well in advance by making application to: The Station Manager, Marina Generating Station, Marina, Co. Cork.

You can find out much more...

about Marina including Quicktime Video and 360° scans of the station by visiting us at www.esb.ie