



Great Island



3958

Oil Power Station



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Great Island



About Great Island

Great Island, located in County Wexford on the shores of Waterford Harbour is an oil fired generating station. It was the first oil fired station in ESB's system to be built outside the large urban areas of Dublin and Cork.

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



Coal



Peat



Gas



Oil



Hydro



Renewables
(other than
Hydro)

Introduction

Great Island Generating Station was opened in 1967. It is located on a 168 acre site in County Wexford, on the shores of Waterford Harbour, at the confluence of the River Barrow and Suir.

Sliabh Coilte, the site for the 200 acre John F. Kennedy Park, overlooks the station. This is an Arboretum built in memory of the late President of America whose ancestral home is only six miles from the station. Specimen trees and shrubs from many countries grow on the southern slopes of Sliabh Coilte, in view of Great Island Generating Station.

A brief history

Great Island forms part of the Parish of Kilmokea in the Barony of Shelbourne. It was known in past times by many names; 'The Island', 'The Great Island', 'Harvey's Island' and 'Du Darry's Island'. The Island has experienced change of the most fundamental kind. Its insular character no longer exists, due to the channel at nearby Campile silting up many years ago and the land having been embanked and reclaimed.

In the fifteenth century Great Island harboured a leper colony. This was a most grim period when Europe was just beginning to recover from the devastation of the Black Death, the plague that wiped out close to one third of Europe's population. In 1979 human remains, probably dating from the late Middle Ages, were found on a site on the island.

In more recent times death and destruction revisited the area when, in 1940, a German

plane dropped bombs on Campile Village with the loss of three young lives.

Construction of the Great Island Generating Station got underway in 1963 with the first 60 megawatt (MW) unit going into service in December 1967 and the second 60 MW unit being opened in April 1968. In 1972 a further single unit of 120 MW was installed. When units 1 & 2 (1967/68) and unit 3 (1972) were commissioned, the station supplied twenty percent of the electricity needs of the country.

In the mid 1980's, following the commissioning of ESB's large coal fired station at Moneypoint in Co. Clare, units 1 & 2 were taken out of service and 'mothballed' pending refurbishment. A dry air system was installed to maintain correct levels of humidity and prevent corrosion damage. In 1990, due to the increased demand for electricity, these units were refurbished at a cost of £11 million.

In 1993, the second 120 MW unit was refurbished at a cost of £9 million. A new control and instrumentation system was installed, the condenser was retubed and some boiler pressure parts were replaced.

How the station operates

Great Island is an oil fired station. Fuel oil is delivered by sea tanker to the Station's Jetty and is pumped to one of five storage tanks overlooking the station. Each storage tank has a capacity of 17,000 tons. The oil is heated to 135°C before being pumped to the burners in each boiler. There are

nine burners on each 60 MW boiler and 12 burners on the 120 MW boiler. Great Island burns approximately 1,500 tons of oil per day when the station is at full output i.e. 240 MW's.

Heat from the combustion is absorbed by water in the boiler tubes that surround the furnace. The water circulates to the boiler drum where it flashes to steam. The steam then enters the superheater section of the boiler where further heat is gained from the flue gases that leave the combustion chamber at 1500°C. Steam leaves the boiler as dry superheated steam at 127 Bar and 538°C through pipework to the turbine.

Live steam enters the turbine through control valves and nozzles and is directed on to blades fixed to the shaft. Energy in the steam dissipates while passing through the turbine thus rotating the shaft, which is coupled to the alternator rotor. Steam is then condensed by water from the nearby Barrow and Suir rivers. The condensate is pumped back to the boiler through a boiler feed pump and feed heating system, thus conserving water and increasing efficiency.

The alternator rotor, which is an electromagnet rotor, spins within the coils of wire in the Stator thus producing electricity. This electricity is sent to a transformer to increase its voltage for transmission to the national grid.

The environment

At Great Island, as at all ESB facilities, the best international practices in



environmental management are adopted. Systems of monitoring and treatment are in place while new silencers have been installed to reduce noise levels.

Great Island was the first ESB station to adopt an effluent treatment system for boiler and airheater washes. Water discharged from the plant is also treated in a neutralising and settling tank, before being discharged safely back into the environment. Licensed disposal companies dispose of solid waste matter.

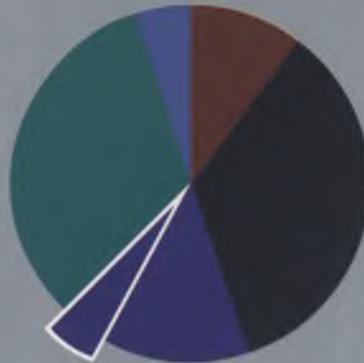
A Great Island Environmental Management Group was established to apply for maximum environmental accreditation and to increase staff awareness of the crucial importance placed on the care and protection of the environment. The overall



Top
Unit 2 Control Panel
Centre left
Air Duct to Unit 1
Centre right
Turbine Hall
Bottom
Removing Generator Outer Casing



ELECTRICITY GENERATION OVERVIEW
(MegaWatt Hrs)



NOTE: Generation Overview based on 1997 figures
Total Generation for 1997 was 20 million MW's

strategy is to ensure that environmental protection is ranked alongside other key goals such as safety and efficiency.

Intertidal and salt marshes beside the station site and the foreshore at Great Island are proposed for designation as Natural Heritage areas. Three rare plant species, two of which are protected, grow in the vicinity of the station but are not impacted by it. Divided Sedge (*Carx divisia*) was considered to be extinct in Ireland until 1990 when it was recorded in several sites along the Barrow Estuary. Borrer's Salt - marsh Grass (*Puccinellia fasciculata*) and Meadow Barley (*Hordeum secalinum*) are found at several locations along the Estuary and are protected under the Flora Protection Order of 1987.

Two fish species, The Twaite Shad (*Alosa fallax fallax*) and the Atlantic Salmon (*Salmo salar*), found in the Barrow Estuary, are protected under the E.U Habitats Directive.

Role within the local economy

Great Island Generating Station has been an integral part of the surrounding local community since its original commissioning. Great Island also contributes to the local economy by purchasing Irish made materials when possible and by providing employment including the use of contractors and temporary staff during major work periods. During the construction more than 350 people were employed on the site with the total capital investment at the time amounting to £14 million.

Role within the community

The management and staff at Great Island have long recognised the crucial role that they have to play in the affairs of the local community and the social responsibilities they have to the community that supports them.

The station is a strong supporter of local initiatives, a willing sponsor of local schools, sporting clubs and other civic organisations, as well as various charity events.

Visitors

The station remains a popular attraction for school tours and for organised groups.

All requests to visit the station should be submitted in writing to: The Station Manager, Great Island Generating Station, Campile, New Ross, Co. Wexford.

You can find out much more...

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