

A PROFILE AND HISTORY OF THE POOLBEG GENERATING STATION





In 1759 the Ballast Office completed the double wall infilled with gravel, thus joining Pigeon House site to Ringsend by road. This granite block wall would later be extended to where the present day Poolbeg Lighthouse now stands.

The Pigeon house is a fine granite building which was originally a hotel, built in the late 1700's. It was named after it's owner Mr. Pigeon. The building now houses the headquarters of the Bolton Trust.

Pigeon House Generating Station (now closed) first generated electricity in July 1903. The foundation stone was laid by the Lord Mayor of Dublin, Mr. T. C. Harrington on 10th February, 1902. The stone is now on view beside 3 Armstrong-Frederick Long Barrell cannons at the entrance to Poolbeg Generating Station. In 1798 the cannons formed part of the Pigeon House Fort armoury. The fear of a French invasion and the possibility of local rebellion, prompted the British military to fortify the area.

From 1902 until 1929, Dublin Corporation Lighting Committee ran Pigeon House Generating Station. The Electricity Supply Board took control of it 1929.

In 1965, the Electricity Supply Board decided to build a new Generating Station beside the Pigeon House.

Poolbeg Generating Station gets its name from the Poolbeg Lighthouse situated at the entrance to Dublin Port.

Poolbeg Generating Station- the present day

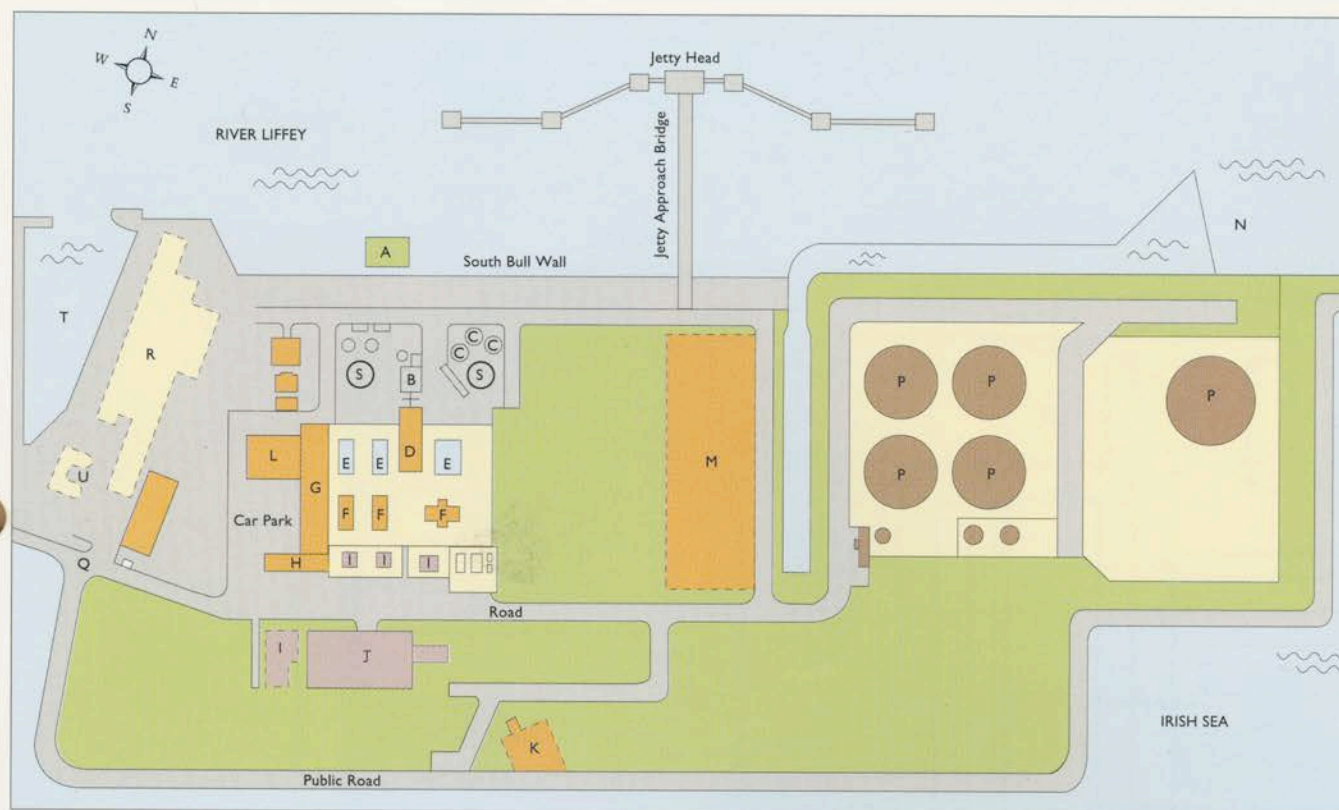
A large area of Poolbeg's ninety acres was reclaimed from the sea. It is estimated that 750,000 tons of sand were dredged from Dublin Harbour and pumped in to fill the site.

Oil tankers of up to 40,000 tons capacity unload their cargo at the open-piled jetty which is unique to the Port of Dublin.

Extensive landscaping of the station grounds has enhanced Poolbeg. The staff at Poolbeg look forward to the arrival of the Brent Geese every winter. A large flock feed on the lush grass surrounding the station.

An amenity area for the people of Dublin has been created by the Electricity Supply board at the Eastern end of Poolbeg's grounds, comprising a sandy beach, clean and safe swimming facilities with ample car parking.





Key:

A Cooling Water Pump House

B Water Treatment Plant

C Water Storage Tanks

D Control Block

E Boiler

F Turbine/Alternator

G Maintenance Block

H Administration Block

I Main Transformer

J 220KV Compound

K Natural Gas Metering Compound

L Stores

M Proposed Extension

Combined Cycle Development

N Cooling Water Outfall

P Fuel Oil Storage Tanks

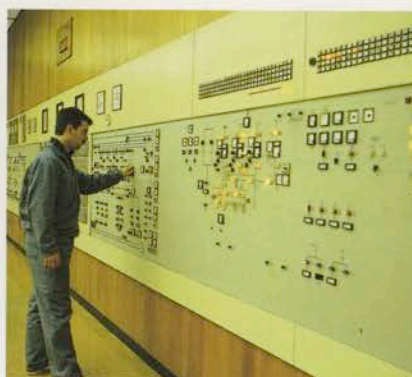
Q Main Entrance

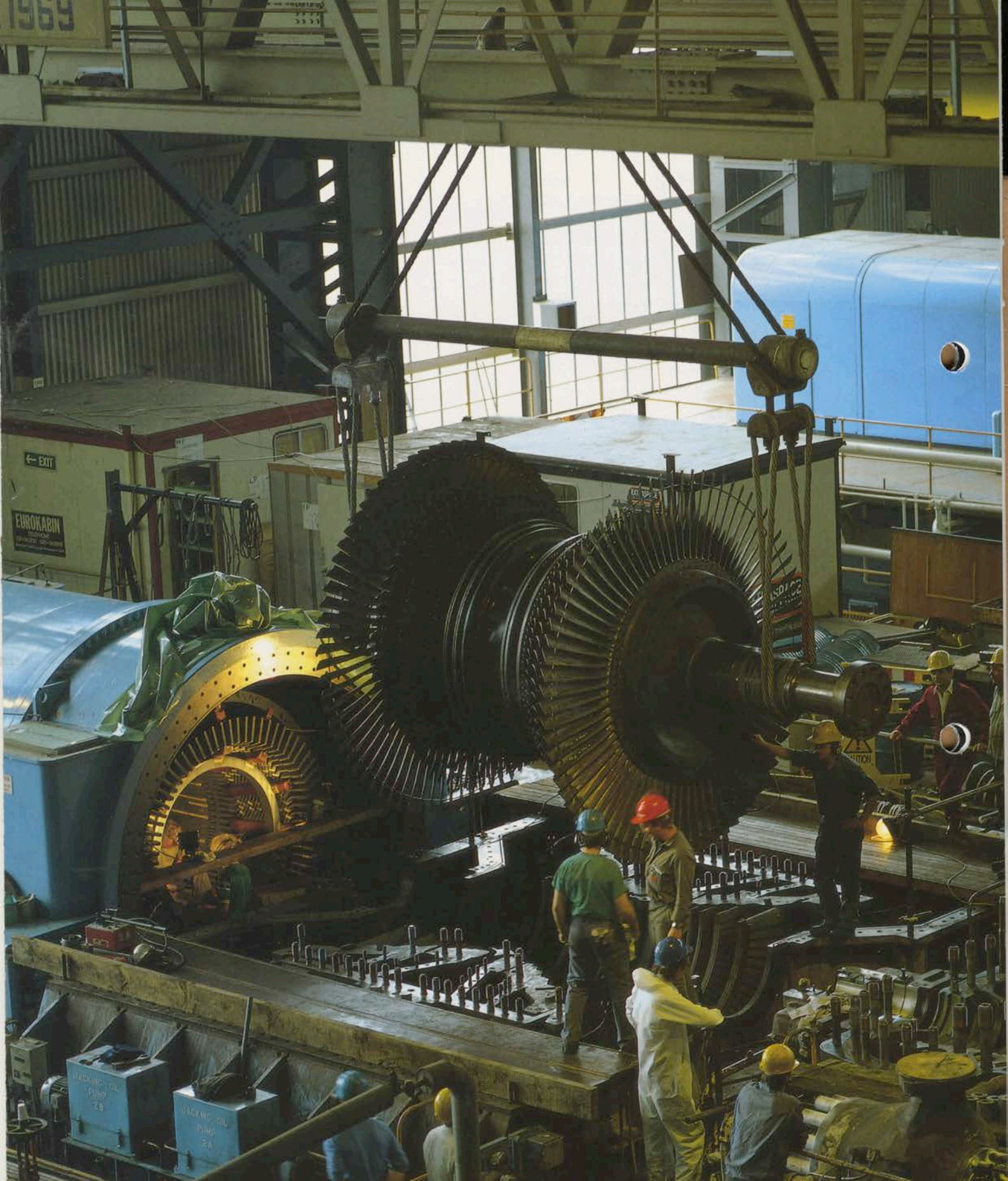
R Pigeon House

S Chimneys

T Pigeon House Harbour

U Hotel Building/Bolton Trust





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← EXIT

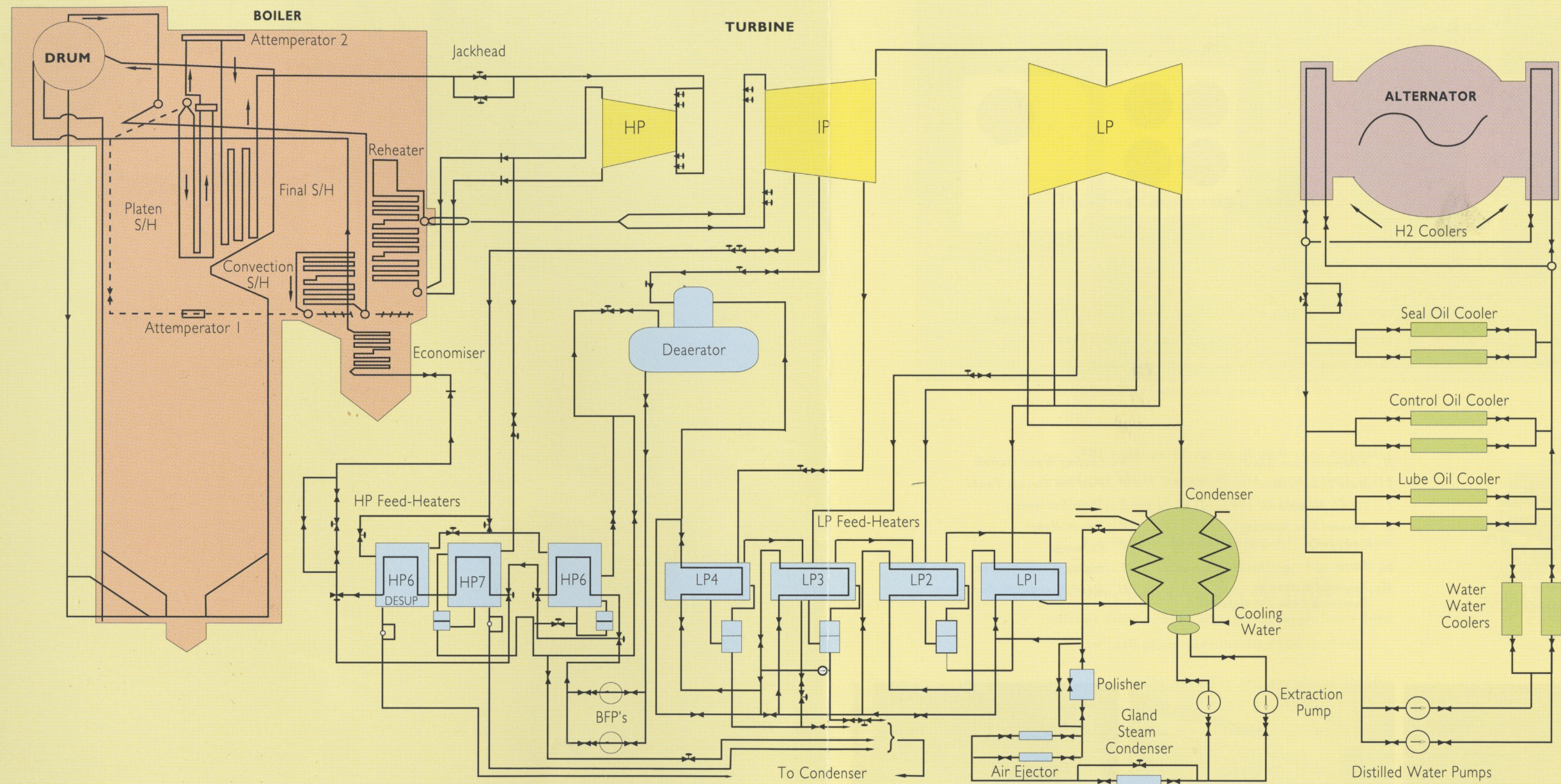
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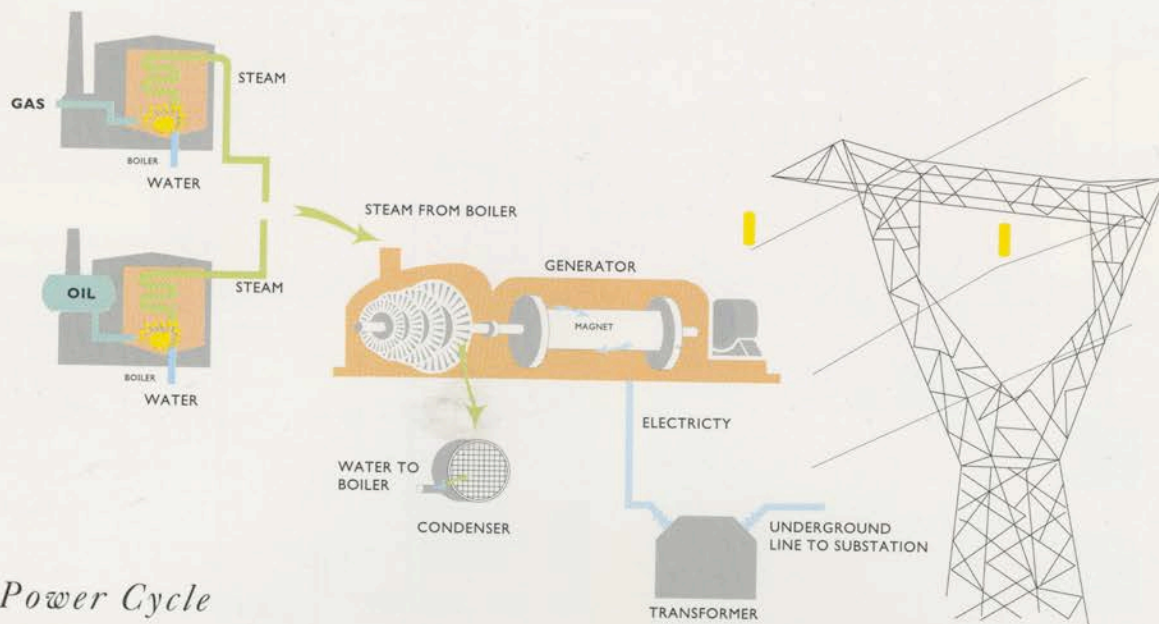
CAUTION

JACKING OIL PUMP 28

JACKING OIL PUMP 2A



Poolbeg 120 MW



Power Cycle

The initial station development at Poolbeg was completed in December 1971. Two 120 Megawatt Units were commissioned comprising two Turbo-Alternators manufactured by Brown Boveri and Boilers by Fives Penhoet, France. Both Units have over 120,000 running hours to date (1992). The initial station development at Poolbeg cost 20 million pounds.

Unit 3 was commissioned in November 1978 at a cost of 40 million pounds. It comprises a Turbo-Alternator manufactured by Alstom, Paris, France and also the Boiler manufactured by M.A.N. Nuremberg, Germany. The output of Unit 3 is 271

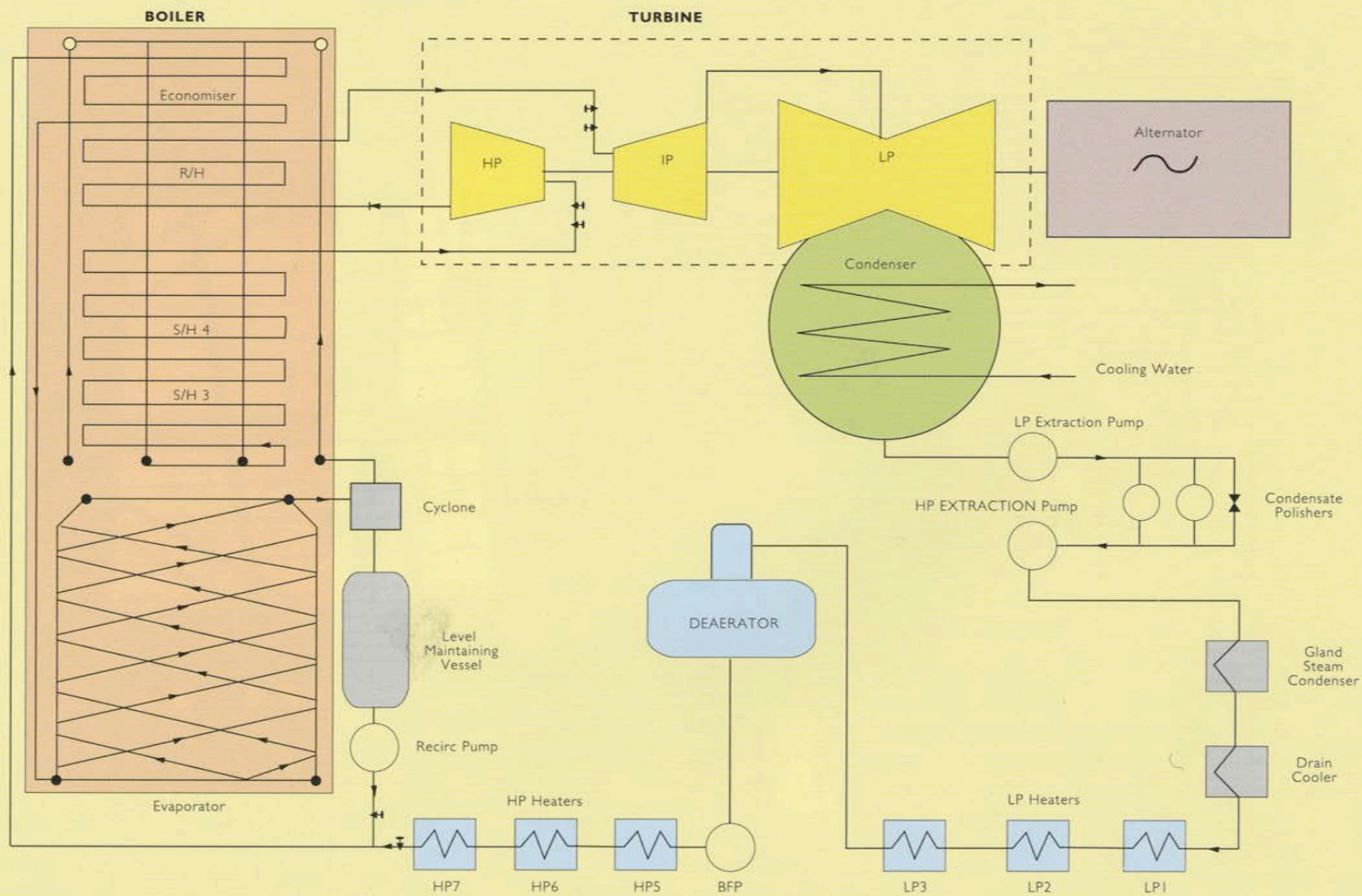
Megawatts. Unit 3 has run for 70,000 hours to date.

Oil for Poolbeg is stored in five tanks having a capacity of 140,000 tons.

Gas is piped from the gas field at Kinsale, Co. Cork to the A.G. station in the grounds of Poolbeg Station.

A centralised control room in Poolbeg combines electrical and thermal plant control equipment for all three Units.

The 680ft twin chimney stacks are the most eye-catching feature of Poolbeg Station. The chimneys have been specially designed to minimise atmospheric pollution.



TECHNICAL PARTICULARS	UNITS 1 & 2	UNIT 3
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Boilers

Year of Construction	1969/70	1977
Manufacturer	Fives-Penhoet (France)	M.A.N. Germany
Pressure	130 kg/cm ²	167 Bar
Temperature Superheater Outlet	538°C	540°C
Live Steam Flow	370 t/h	780 t/h
Reheater Inlet Pressure	30.5 kg/cm ²	44.1 bar
Reheater Outlet Pressure	28.5 kg/cm ²	41.5 bar
Reheater Inlet Temperature	340°C	357°C
Reheater Outlet Temperature	538°C	540°C
Reheater Steam Flow	333 t/h	680 t/h
Feedwater Inlet Temperature	233°C	258°C
Air Temperatures Intake Air	35°C	35°C

Airheaters

Type	Regenerative	Regenerative
Number	2	2
Manufacturer	Rothemuhle	Rothemuhle

Boiler Control

Supplier	Hartmann & Braun/Controle Bailey Hartmann & Braun
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Induced Draught Fans

Manufacturer	Davidson & Co Ltd	Kuhnle, Kopp & Kausch
Number of Fans	2 Outdoor	2 Outdoor
Speed	745 r.p.m.	1,480 r.p.m.
Flow	245 t/h	318m ³ /sec

Forced Draught Fans

Manufacturer	Davidson & Co. Ltd	Kuhnle, Kopp & Kausch
Number of Fans	2	2
Speed	995 r.p.m.	1,480 r.p.m.
Flow	252 t/h	250 m ³ /sec
Pressure	516 MMWG	60.26 mbar

Flue Gas Recirculation Fan

Manufacturer	Davidson & Co Ltd	Apparatebau Rothemuhle
Number of Fans	2	2
Speed	980 r.p.m.	990 r.p.m.
Flow	31.2 t/h	120 m ³ /sec
Pressure Rise	228 MMWG	288 MMWG

TECHNICAL PARTICULARS	UNITS 1 & 2	UNIT 3
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Burners

Manufacturer	Babcock Product Engineering Ltd Peabody, England Crewley, England	
Number of Burners x Number of decks	3 x 4 Front Firing	4 x 4 Corner Firing
Ignition Fuel	Propane/Natural Gas	Propane/Natural Gas
Fuel	Natural Gas/Heavy Fuel Oil	Natural Gas/Heavy Fuel Oil
Atomising of HFO	Steam	Steam
Burner Management	Babcock	M & S Hamburg
Control	System 9,000	

Boiler Type	Natural Circulation	Once Through
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1 Drum	Recirculating Pump
Fusion Welded with	Supplier: Klein,
Centrifugal Separators and	Schanzlin & Becker
Chevron Driers	Type: 2-stage
Maximum Working Pressure:	Operating Temp: 354°C
150 kg/cm ²	Operating Pressure:
	183 bar
Inside Diameter: 1,524mm	Motor Rating: 500KW
Shell Length: 10,300mm	
Shell Thickness: 80mm	Speed: 2,950 r.p.m.

Superheat Temperature Control

Type	Two-Stage Attenuation	Two-Stage Attenuation
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Reheat Temperature Control

Type	Gas Recycling/Damper	Gas Recycling/ Attenuation
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Safety Valves - Superheaters

Number	2	2
Type	1 Sempell Safety, 1 Electromagnetic	Sempell Pilot Assisted
Discharge Capacity- Sempell	83.6 t/h	410 t/h
Lifting Pressure - Sempell	137.5 kg/cm ²	186 Bar

Boiler Feed Pump

Manufacturer	Sulzer Brothers Ltd, England	Sulzer Brothers Ltd, England
Number of Pumps	2 x 100%	2 x 100%
Speed Control	Voith Coupling	3A Electrical Cascade 3B Voith Coupling
Flow	400 t/h 150 kg/cm ²	874 t/h 240 Bar

TECHNICAL PARTICULARS	UNITS 1 & 2	UNIT 3
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Boiler Feed Pump Motor

Manufacturer	A.E.G.	Brown Boveri, Switzerland
Voltage	6.6 kV	6.6 kV
Power	3,200 kW	9,000 kW
Speed	1,454 r.p.m.	1,492 r.p.m.
Current	328 Amp	948 Amp

Condensate Extraction Pump

Manufacturer	Sulzer Brothers, England	Rateau, France
Number of Pumps	2 x 100%	2 x 100%
Flow	292 t/h	720 t/h
Pressure	23.5 Bar	20.25 Bar
Motor Manufacturer	A.E.G.	Schorch
Number of Motors	2	2
Capacity	285 kW	760 kW
Speed	1,488 r.p.m.	900 and 2,968 r.p.m.

Turbine

Manufacturer	Brown Boveri, Switzerland	Alsthom, France
Output	120 MW at M.C.R.	271 MW at M.C.R.
Speed	3,000 r.p.m.	3,000 r.p.m.
Type	3 cylinder, single shaft impulse reaction	3 cylinder, single shaft impulse reaction

Reheater Steam at Turbine

Pressure	127 kg/cm ²	160 Bar
Temperature	535°C	538°C
Flow	370 t/h	780 t/h

Reheat Steam at Turbine

Pressure	29 kg/cm ²	39 Bar
Temperature	535°C	538°C
Flow	333 t/h	680 t/h

Low Pressure Feed Heaters

Number of Heaters	5	4
Type:		
Surface	4	3
Contact (deaerator)	1	1

TECHNICAL PARTICULARS	UNITS 1 & 2	UNIT 3
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High Pressure Feed Heaters

Number of Heaters	3	3
Type	Surface	Surface

Efficiency of Cycle

	9,230 KJ/KWH or 39%	9,000 KJ/KWH or 40%
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Alternator

Manufacturer	Brown Boveri, Switzerland	Alsthom, France
Rated Output	120 MW/150 MVA	271 MW/318 MVA
Speed	3,000 r.p.m.	3,000 r.p.m.
Voltage	13.8 kV	20 kV
Current	6,270 Amps	9,204 Amps
Cooling	Closed gas circuit cooling by hydrogen	Stator water cooling with rotor cooling by hydrogen
Hydrogen Pressure	2 kg/cm ²	3 Bar

Main Exciter

Exciter Rating	735 kW	1,380 k.v.a. @ 0.95 P.F.
Voltage	410 V	415 V
Current	1,790 Amps	1,920 Amps
Speed	1,074 r.p.m.	3,000 r.p.m.

Pilot Exciter

	9 k.v.a.	32.5 k.v.a. @ 0.35 P.F.
Voltage	380 V	94 V
Current	13.7 Amps	200 Amps
Speed	1,074 r.p.m.	3,000 r.p.m.

Condensers

	Two independent halves on the sea-water side (C.W.). Each half has 2 passes with continuous cleaning by a Taprogge system.	Two independent halves on the sea-water side (C.W.). Each half has 2 passes with continuous cleaning by a Taprogge system.
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TECHNICAL PARTICULARS	UNITS 1 & 2	UNIT 3
Condensers continued		
Manufacturer	Harland & Wolff, Belfast, Ireland.	Hamond Sobelco Belgium/Parsons Ireland.
Number of Tubes	11,000	17,934
Tube Material	Titanium	Titanium
Cooling Surface	6,140m ²	16,500m ²
Water Flow	14,500m ³ /h	26,500m ³ /h
Vacuum	35 mbar	35 mbar
Sea Water Temperature Inlet	4°C Winter to 16°C Summer	4°C Winter to 16 °C Summer

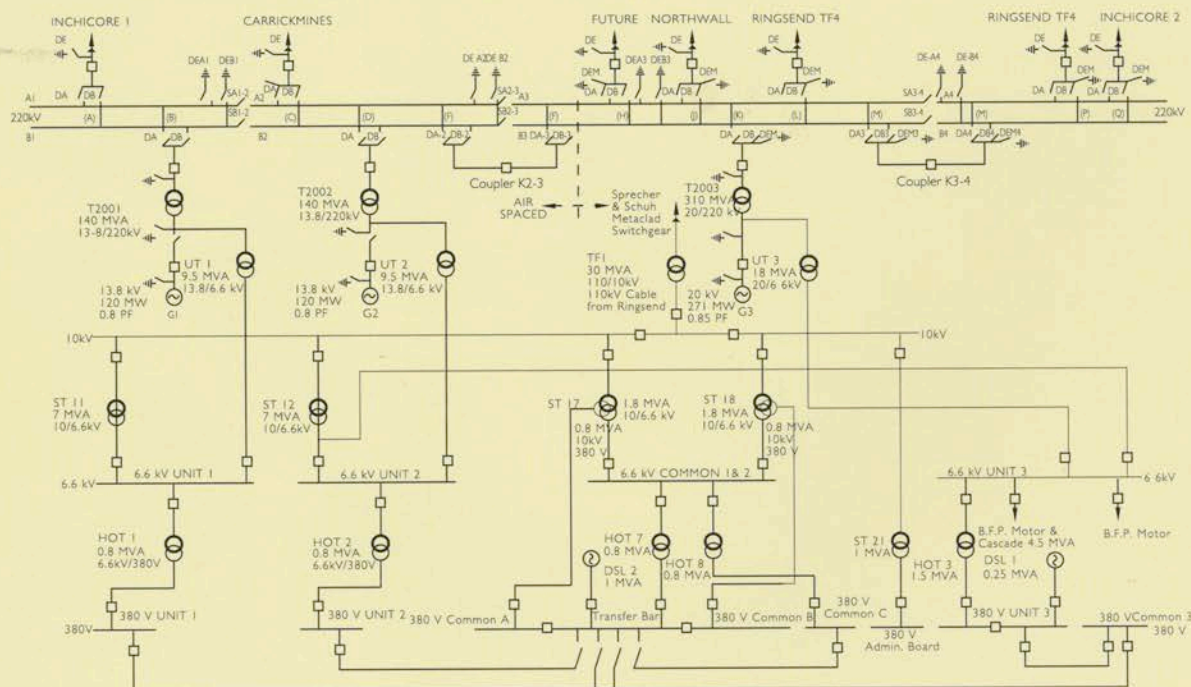
Main Transformers	T2001 & T2002	T2003
Manufacturer	Lepper, Germany	Smit
Rating	84/140 M.V.A.	250/310 M.V.A.
Year of Manufacture	1969	1977
Volume of Oil	50,800 Litres	88,350 Litres

TECHNICAL PARTICULARS	UNITS 1 & 2	UNIT 3
Unit Transformers	UT1 & UT2	U3
Manufacturer	Unidare, Ireland	A.C.E.C. Waterford, Ireland
Rated Output	9,500 KVA	18,000 KVA
Rated Voltage H.V.	13,800 V	20,000 V
Rated Voltage L.V.	6,800 V	6,880 V
Rated Current H.V.	398 A	520 A
Rated Current L.V.	806 A	1,510 A
Year of Manufacture	1970	1976
Total Weight	22.65 Tonnes	29.2 Tonnes

220 K.V. Compound

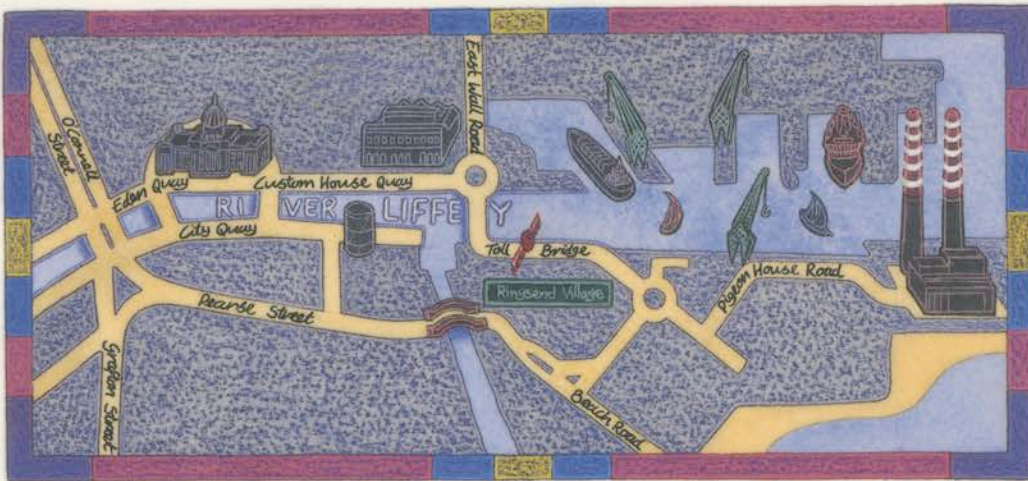
Twin busbar system with a combination of air spacedisconnects and SF6 gas breakers. While all equipment in the unit 3 extension is of the sodium hexafluoride (S.F.6). Metal clad enclosed type.

No. of Lines:	6
No. of Sectionalisers:	6
No. of Breakers:	12
No. of Couplers:	2



Electrical Line Diagram of Units 1 - 3





for more information contact

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