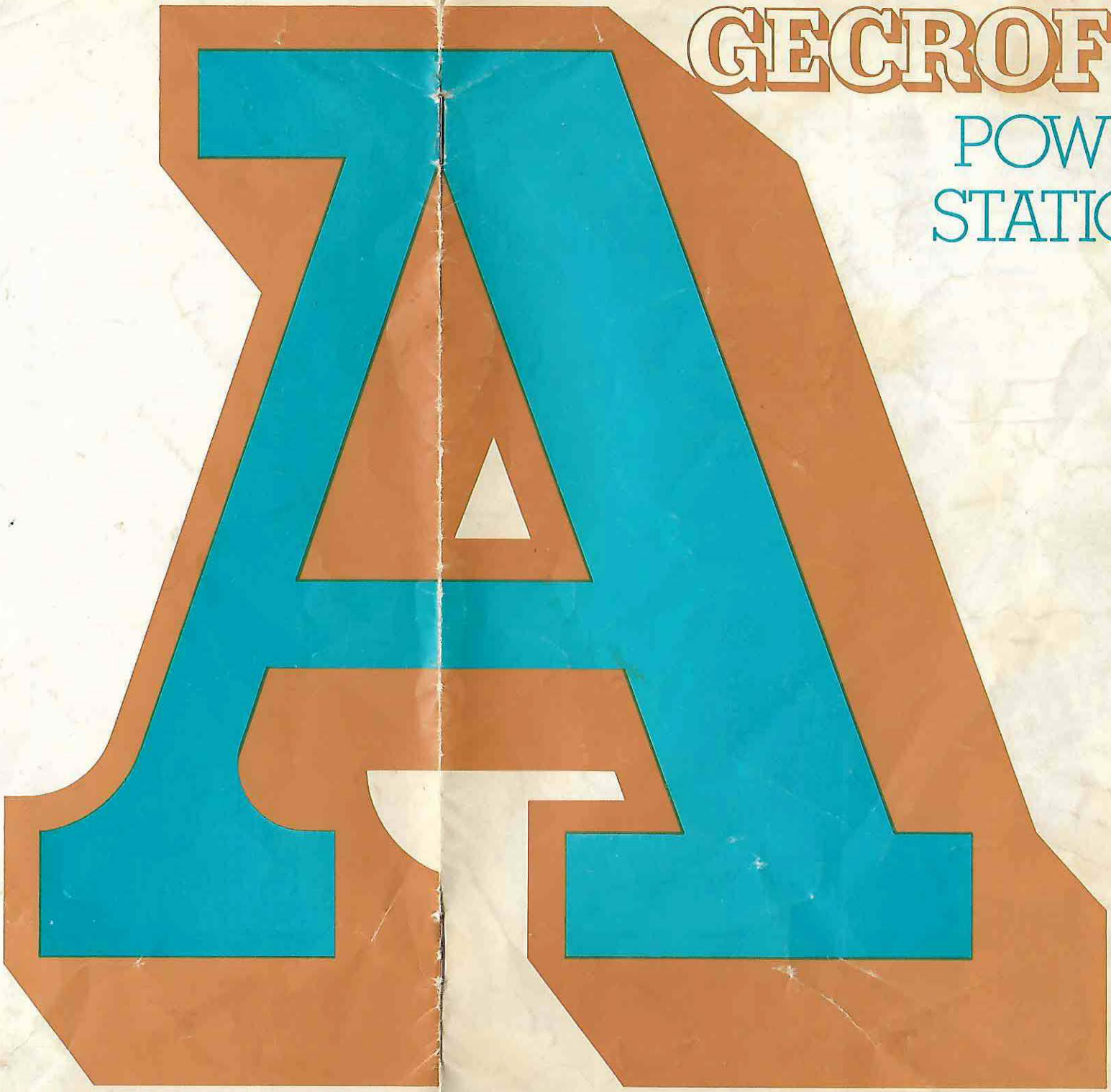
GECROFT

POWER STATION



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Agecroft was first chosen as a site for a power station by the Salford Corporation whose electricity works and tram car system were operating by the very early 1900's.

The city's advance to its present place in the world of engineering can be traced to the day in 1360 when Sir John Radcliffe of Ordsall brought families of weavers from Flanders to Salford. The lineal descendants of these weavers were among those who, centuries later, worked in Salford's first cotton mills, and whose skills, adapted to the processes of volume production, demanded the rapid growth of an engineering industry.

There was abundant coal on the doorstep, and low-cost transport was provided by the extension of the inland canal system. The railways came. A tide of enterprise was begun which reached full flood in the inventiveness and technical developments of the 18th and 19th centuries.

Like each of the three power stations that came after it, the Salford Corporation Electricity Works was sited on the banks of the River Irwell.

One of the canals of the Irwell ran through the plantations of Agecroft Hall, the site of which is now covered by the ashing area of the station. The existence of Agecroft Hall was first recorded in the reign of Henry 1. Later, in 1199, King John granted 'a caracute of land, to be held in see and inherited by payment of ten shillings'. The Hall was used for residential purposes until 1924, when it was dismantled and shipped to the United States, where it was erected at Windsor, Virginia.

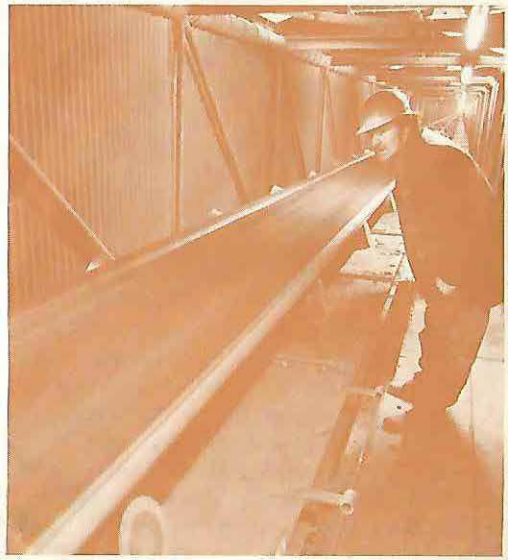
Agecroft Hall

Agecroft Power Station

Agecroft 'A' was opened in 1925, and by 1945 had attained a total plant capacity of 57 500kW. The station which followed it, Agecroft 'B' commenced operation in December 1950, and was housed in new buildings a short distance away.

Agecroft 'B' was originally planned by Salford Corporation. Before the station was completed and during the re-organisation of the electricity industry, major reconsideration of the original project was made. A decision was made to build a 'C' section with much larger generating units.

The construction of the C section meant an extension of the coal handling facilities. A closer link with the neighbouring Agecroft Colliery was established when a conveyor system was built to transport coal from the washery plant to the station hoppers.



Coal conveyor link

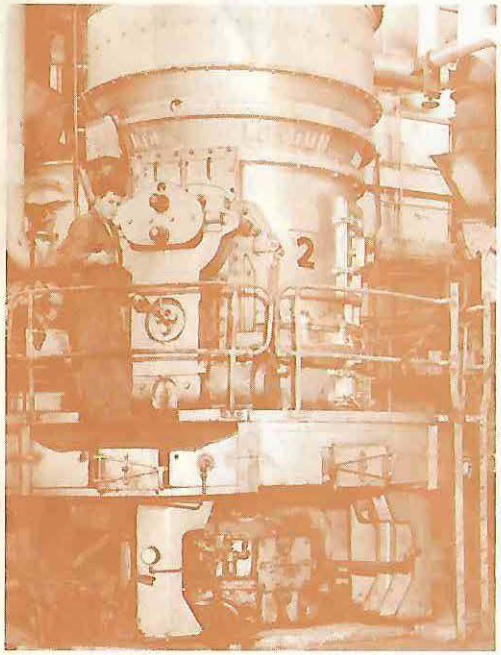
The weekly coal consumption at Agecroft is 15 000 tons during the winter months. This tails off during the summer when the demand for electricity drops and the station is engrossed in its overhaul programme.

Since the conveyor link began operating in 1961 it has handled some 61 million tons.

The power station has a storage area for 165 000 tons and although most of the coal comes from Agecroft colliery some is delivered by road and rail from Yorkshire.

Boiler Plant

Coal pulverising mill



'C' Station

Coal for immediate use in the boilers is stored in overhead glass lined bunkers. One bunker, containing 1 500 tons of coal, is provided for each boiler. The coal is taken in pipes under gravity to the pulverising mills, which are located in the basement of the station. Each boiler has five mills to serve it, and each mill can grind up to 15 tons of coal per hour to a fine dust.

As the 'C' station is constructed for unit operation, there are two boilers associated with two turbo-alternators. There are no cross connections between the steam systems and water systems of the two units. Each boiler, under full load conditions, delivers 810 000 lb of steam per hour at a pressure of 1 600 lb/sq. in. and at a temperature of 543°C. After the steam has expanded through the high pressure stage of the turbine, it is returned to the boiler and re-heated to 540°C at a pressure of 396 lb/sq. in. At full load, the quantity of steam re-heated is 735 000 lb per hour, the other 75 000 lb having been extracted from the high pressure turbine and used for heating and boiler feedwater.

'B' Station

The four boilers in the 'B' station are of the high-head pulverised fuel fired type, with primary and secondary superheater, and attemperators for final steam temperature control.

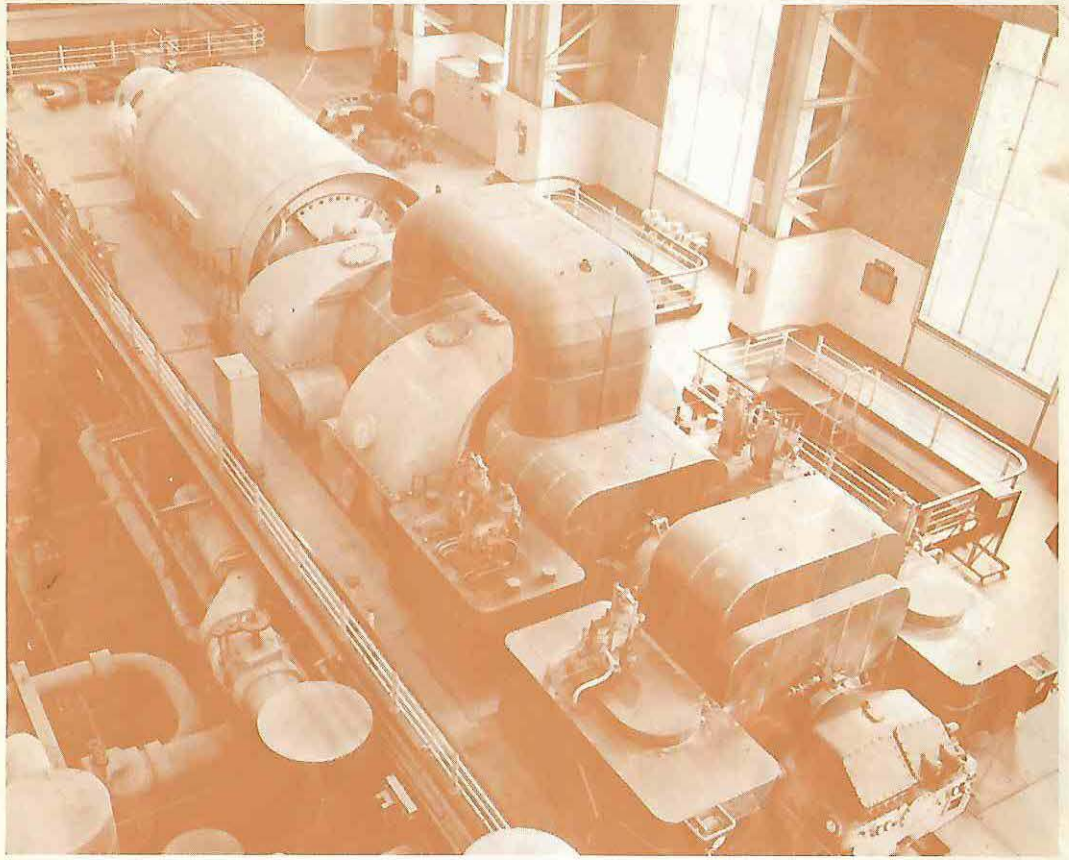
Coal is crushed to a fine powder by three pulverising mills linked to each of the four boilers. The coal is blown into the combustion chamber by large fans.

The combustion chamber is fully water-cooled by water walls of fin-tube construction, and the boiler surface totals 7 220 sq.ft including the water walls. The heat release in the furnace takes place at the rate of 16 000 BTU per cubic foot per hour, and the combustion chamber volume is 25 200 cu.ft.

The boilers are capable of generating 315 000 lbs of steam an hour each, with a feed water temperature of 171°C, the steam pressure being 625 lb/sq in gauge, and the temperature 463°C.

Turbo-alternators

'C' Station



Turbo-alternator plant

In the 'C' station there are two turbo-alternators. Steam passes through the high pressure cylinder and is returned to the boiler for re-heating before entering the intermediate pressure cylinder. From the intermediate cylinder the steam is transferred through overhead pipes to a low-pressure cylinder. The turbine has two exhausts, which feed into twin condensers having a total surface area of 85 000 sq. ft. to condense the steam back into water.

Each alternator generates power at 13 000 volts, and is rated at 120 000kW.

'B' Station

The 'B' station turbine house has two turbo-alternators, each with a maximum continuous rating of 55 000kW.

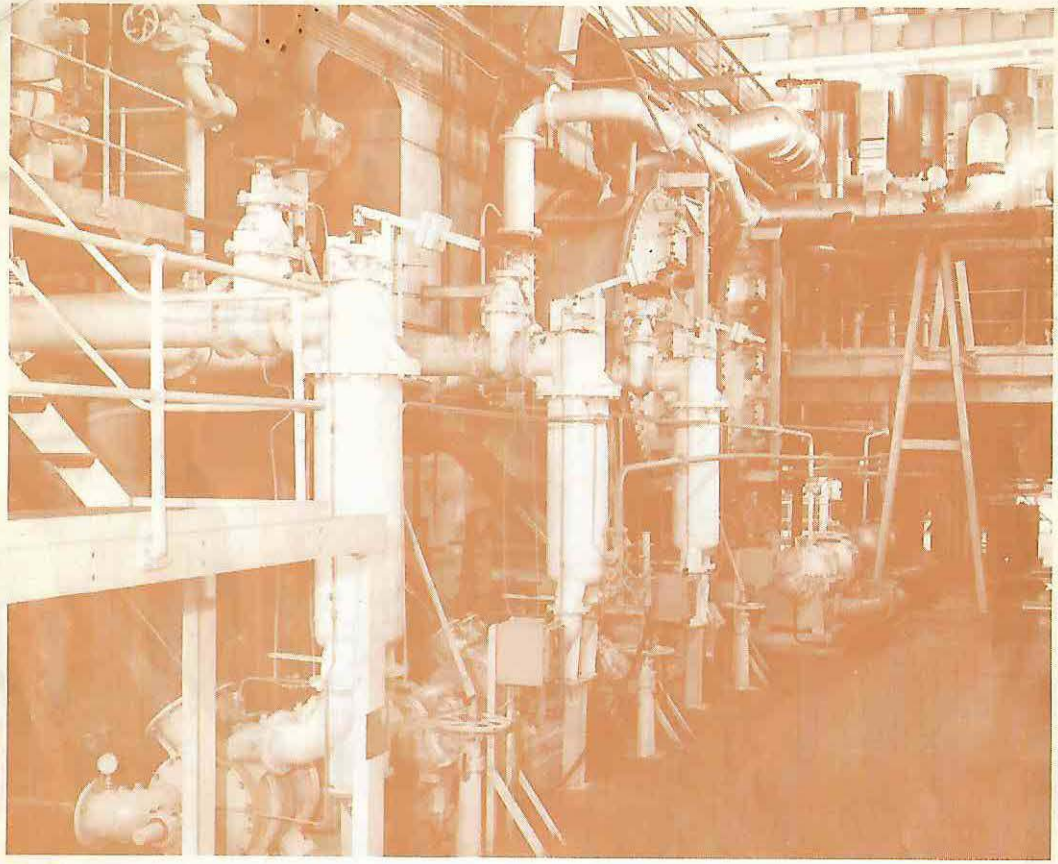
The turbines, which receive steam at 600 lb/sq.in at a temperature of 454°C.

Circulating System

To condense the exhaust steam from the turbines approximately 13 million gallons of cooling water per hour must be supplied to both the stations condensers.

This water is drawn by the circulating water pumps from the ponds of the four cooling towers, two of which are associated with the 'B' station, the other two supply the additional requirements of 'C' station.

All four towers are 312 ft high and 215 ft in diameter.



Condensing plant

Tower Make-up Water

To make up the loss of water from the cooling system — due to evaporation in passing over the cooling towers and losses incurred in purging from the tower ponds — three 150 000 galls/hour borehole pumps are installed which draw water from the River Irwell. A further 30 000 galls/hour borehole pump, drawing water from an underground source, is also available.

These pumps meet the make-up water requirement for the circulating cooling water systems of both 'B' and 'C' stations.

PFA Handling

Ash and dust are collected from several points in the boiler furnace and gas systems. Furnace ash falls through the bottom of the furnace into an ash hopper and is carried through a low pressure water sluice-way to the ash sump outside the boiler house. The ash is grabbed out of the sump and loaded into ash lorries for disposal.

Dust collected from the economiser, air heaters, gas ducts and superheater enclosures is removed by a water ejector system and conveyed in the low pressure water sluice-way to the ash sump.

Pulverised fuel ash (PFA) retained by the electrostatic dust-arresting plant, collects in concrete hoppers and is then conveyed by air slides into a buffer hopper. This discharges into a screw conveyor feeder and the PFA is then carried by compressed air along pipe-lines for approximately 350 ft to bunkers. As the PFA leaves the bunker hopper outlets, it is passed through a conditioner where a regulated water spray prepares the material for transport by road away from the site or for disposal in the adjacent tipping area.

Considerable quantities of PFA from Agecroft are employed in the manufacture of building blocks, as a cement additive, and as a bulk or selected fill in the construction of roads and embankments, landscaping etc.

Electrical Plant

The original 132 000 volt sub-station was commissioned to connect Agecroft 'B' station to the Grid Transmission System and was superseded by the present sub-station. The sub-station has fourteen circuits consisting of seven overhead line feeders, two of which also supply grid transformer connections to Agecroft 'B' 33 000 volt system, two underground cable feeders to another sub-station, two bus couplers, one bus coupler/section, and the underground 132 000 volt connections to Agecroft 'C' generator transformer units.

The 132 000 volt switchgear is controlled from the main power station control room in the 33 000 volt sub-station building, where indications are given of normal working conditions, and alarms operate in case of failure of any essential equipment.

Control room