British Electricity Supply Industry: Part 3

Recovery after World War II

Meeting demand growth

When the Industry was nationalised in 1948 it was called British Electricity Authority (BEA). The ‘powers’ behind this name completely messed up because it caused massive confusion with British European Airways also trading under the banner BEA. Within about two years the industry was re launched as Central Electricity Authority (CEA). In the late fifties it was changed to CEGB when regions were established covering England and Wales; Scotland granted self-determination with regard to Generation and Transmission development with trading across the border.

From the end of the War until the mid-fifties there was a major deficit of power to meet growing demand. This was aggravated by large blocks of power being restricted through lack of transmission capacity. Equally there was a major health problem in London and other major cities with ‘pea soup’ smog killing people in their thousands across the country caused by industrial pollution.

These old power plants were partly to blame and needed replacing as soon as possible. I believe there were some 30 small power stations in London alone average size 2 to 8 megawatt.

For example Kingston 'A' had only a 1.5MW and 3MW Brush horizontally opposed generators. Kingston 'B' was built by Kingston Corporation and opened by King George VI before the war was commissioned in 1948. It had an installed capacity of 120 megawatts and a ‘house’ set 3MW. (‘Black Start’ capability).

Although it was originally designed to use Brush generators, the 30MW Brush was found unreliable and hence conventional single shaft machines were installed (this was big stuff at the time!). Croydon was 'truncated' to 198MW which 'unbalanced' the already slow ‘Coal to Bunker’ plant. It could never maintain full load all day. Immediately after the war the municipals started building plant again but by the time of Nationalisation in 1948, it was realised the units were too small.

It was not difficult to make a strong case for central planning to expand the Grid System. So, there was a rapid move to 120MW, and then 250-350MW generators. It was also realised that the scale of overland coal transport needed for much larger stations near demand sources would be untenable. So it was that 500MW, and then 660MW unit stations were designed near the fuel sources (coal at the pits and oil at the refineries) with the 275kV then 400kV Supergrid going in for Bulk Power Transmission.

The long established seaborne route from the Northumbrian coalfields to the Thames Estuary allowed for large stations below Tower Bridge (including West Thurrock, Richborough, Tilbury, Littlebrook, Kingsnorth dual fired and Grain adjacent to the oil refineries). To establish fuel diversity alongside this building works, major nuclear programme was in full swing, extending the Magnox type reactor and introducing the AGR reactor.

Up to the end of the 60s the older (municipal) plant was still running hard to meet the winter demands. Coal fired plant running weekday base load and even the Open Cycle Gas Turbines (OCGTs) were being thrashed for 16 hours a day.

However, after the 1972/73 miners' strike, the margin situation eased and the older plant went to two shifts or Peak only operation. By the middle/late 70's most of the ancient ex municipal stations (some of which had started life circa 1890-1900) had shut down, along with the post war coal stations which had been converted to oil. The remainder of the municipal build (coal fired) plant went in the early 80's.

The Control Framework comprised National Control with six Area Control Centres, the later actually instructing the large power station output target to meet demand. The Inter-Area transfer system allowed for a degree of area based correction for forecast demand and generation errors. Strict National Control optimisation in On Load cost Merit Order was carried out at Peaks and Troughs with Transfer balance operation in between.

Within the BEA/CEA a planning department was set up in those early years, London based, to tackle this problem on an urgent basis and produce a five year and 10 year rolling plan. I guess the forerunner to what is done today. These plans, which were fully costed, were accepted by the Government and given the go ahead. This started with the development of a 275kV line from Staythorpe to Sundon - basically connecting the Midlands to the South.

This was commissioned around 1963, and was rapidly followed by extension north, eventually linking with Scotland. Whilst this was progressing, research on building and upgrading to 400kV was being undertaken at the CEGB Leatherhead Research Laboratories. Alongside this a major power station build programme was in full swing and integrated with the Transmission development. During the 1960s and 70s, demand for electricity was estimated to double every 10 years.

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