

British Electricity Supply Industry: Part 2

National Control: Preparation for WW2

You have to go back to about 1936 when the then government decided that Germany was intent on going to War in Europe - actions were taken around this time to prepare for war as a real eventuality. That involved building up armaments, aircraft and defences, rolling out evacuation procedures to protect civilians, as well as establishing civil defence (Dads Army!). Critical to this preparation was the security of supply to essential service and manufacturing industries to minimise disruption.

At this time the electricity network comprised myriad small networks with very little interconnection between them, the highest voltage being 132kV, and London almost entirely 66kV and lower. All power stations were either owned and run by local authorities like Battersea and Deptford or privately owned, like Fords at Dagenham, and London Underground (Lots Road). In all there were over 100 'small' power stations in and around London, supporting their own local demand - most at 50Hz but some at 60Hz. Only if your neighbour had spare capacity and was willing to sell energy did any form of interconnection take place - and that would be only for short periods (perhaps over a peak demand).

Although this was very inefficient, each local authority was very protective of its ability to provide its own electricity. Remember this was a new technology for many people and a race to see who could build the biggest and best power station.

This fragmented grid network, which in reality was only a distribution network built around the power stations, couldn't provide the electrical power required to support the war effort. Neither was it secure plus it was grossly inefficient as they all carried their own reserve capacity!

The Government (War Department) in their preparation for a sustained War initiated action for all major Power Centres to be interconnected and to come under a single command structure and control. (The birth of National Control) A major 132kV construction programme started around the Country including Scotland and Wales which was completed in time for this new command centre to begin a program of interconnection operation.

National Grid Control was responsible for frequency and time control, inter-area transfer of energy between areas within the limits of security and tie-line capacity to obtain the maximum use of high merit generating plant at lowest cost. However the most important function was to issue emergency generation and load shedding instruction to Area Controls where generating plant could not meet consumer demand.

It is claimed that on the 29 October 1937 an enterprising National Control engineer on night shift instructed closure of all Grid interconnectors between Areas. The Electrical Engineers at the time had no computers only paper; pencil and slid rule, hence used hand calculations to determine the resultant power flows and voltage conditions. This was the first time the Grid System had been fully interconnected and from 1938 it has remained fully operational as a National Transmission Network ever since.

Note: This was a major success and after the War finished in 1945 encouraged the Government to nationalise the whole industry in 1948.

With the outbreak of WW2 being imminent it was important to maintain this Central Control structure to minimise disruption to energy supplies. Clearly this National Control Centre needed to be below ground level and deep enough to survive heavy bombing in London. Such a place was found at St Paul's underground station. This comprised of two empty disused lift/ventilation shafts which, from ground level were some 120 feet deep. The move to St Pauls (down the "Hole") happened in 1940, housing both National Control and Thames Area Control.

Within these shafts a Battery room and ventilation plant room were at the lowest point with telecommunication adjacent. The next level above was the National Control room with adjacent tele-printer room. On the next level above this was the Thames Area control with separate Switching and Loading and tele-printer rooms.

Despite the heavy bombing the control rooms were undamaged and remained operational until about 1948 when they came above ground into a prefabricated building in Paternoster Square adjacent to St Pauls Cathedral. At this time the Thames Area was divided into Thames North and Thames South, the boundary being in the main the River Thames and subsequently re-located to Rebourne in Hertfordshire (Thames North) and East Grinstead in East Sussex (Thames South). Likewise National Control was re-located to 8th floor in Bankside House, Sumner Street, Southwark, London.

Resource and written by Tony Malins (September 2016)