



Boxer Tommy Farr... his title fight with Joe Louis led to a surge in demand for electricity.

periment was tried — just for that winter.

All went well. And in the spring of 1939 it was decided to keep the grid as one integrated system — the largest in the world.

It was a timely decision. When the war came the unified grid proved a lifeline feeding electricity supplies from blacked-out London to war-effort factories in the South West and Midlands. And when the blitz hit power stations, alternative supplies could be brought in from other parts of the country.

But keeping supplies flowing was more difficult. Power station staff were struggling to keep plant in service despite lack of proper maintenance. Coal supplies were short and of poor quality. As one engineer said: "When incendiary bombs dropped on the coal dumps, they just fizzled out."

Things were no better post-war. In spite of urgent warnings, the Government limited station coal stocks to a dangerously low level — and then disaster struck. Because of unprecedentedly severe gales in late 1946 and the following Big Freeze, coal supplies could no longer get through. For three months homes and all but essential industries were ordered to "switch off" during mornings and afternoons.

Control in 'The Hole'

THE National Grid proved its value during the blitz bringing power supplies from Scotland and South Wales to London and other major cities when they were bombed.

Several London stations, notably Fulham and Battersea, were badly damaged.

The grid system itself was not immune. Bombs and other enemy action were the cause of more than 300 transmission faults during the war but barrage balloons — used as a defence against low-flying aircraft — were even more of a problem, causing more than 1,600 faults in the same period. They would break free, dragging their steel mooring cables across power lines.

National Control, the nerve centre of the power system, was moved to a safer home when Bankside, just south of the Thames in London, was hit by bombs.

It had to stay in London because of the existing communications network. Its new home was in the disused Post Office Tube station near St Paul's Cathedral. Nicknamed "The Hole" — it was at the bottom of the station's two shafts — it became something of a legend to later generations of control engineers.



Only the existence of the grid stopped the country being brought to its knees — and even so the effects were severe.

Then in August came the Electricity Act, 1947. The electricity supply industry with its 540 undertakings was to be nationalised — and the new British Electricity Authority would be left to pick up a major part of the problems. Trying to meet the increasing and urgent demand for electricity with insufficient plant and, as the "Central Authority," to exercise a general control of policy for the whole industry, including the 14 Area Boards.

It was no small job.

Miracles take a little longer

THE reorganised industry came into being on April 1, 1948 — and the new British Electricity Authority could have taken as their motto: "The impossible we do today — miracles take a little longer!"

The situation was critical. Government restrictions and shortage of supplies meant that only a third of the new plant planned towards the end of the war had been commissioned. The BEA had inherited nearly 300 power stations, but a lot of the plant was over 25 years old with many sets generating less than 8MW.

Even in summer there was a plant shortage because of the need for essential maintenance and overhaul, while a severe winter that year would have left the industry 1,650MW short. The future looked equally bleak. As the Authority told the Minister of Fuel and Power in their first annual report: "By Vesting Date it was clear that the situation, far from improving, was likely to deteriorate further."

In the first year's operation there was only one crumb of comfort. Massive efforts by power station staff to keep the maximum amount of plant in operation plus the best possible use of the grid had halved the number of power cuts — to 79 occasions!

The first priority was to get new plant into commission as quickly as possible. The size of generating units was limited by ministerial order to 30MW and 60MW sets, even though Battersea had installed a 105MW unit back in the 1930s. What mattered then was to have sets of proven reliability, and the strategy paid off — but there was another problem. It was no use providing plant without the means of delivering the power supplies.

The original grid had served the country well, but to meet the future needs the carrying capacity would have to be doubled. Rather than festoon the country like a spider's web with more 132kV lines, the BEA decided to build a supergrid network of 275kV lines, each able to carry six times the power. Not only that. The lines were to be capable of modification to operate at 400kV.

All in all it was a formidable engineering programme, but that was only part of the problem facing the new authority. They had to create an or-

ganisation that would work effectively.

The men at the top couldn't have come from more different backgrounds. The Chairman, Lord Citrine, had been General Secretary of the TUC. His deputies were John (later Sir John) Hacking, Chief Engineer of the CEB who now took over operations, and Sir Henry Self, from the Civil Service who headed the administrative side.

The headquarters staff were spread between a number of premises. At first the main administrative HQ was at Generation House — a rabbit-warren of a place in Great Portland Street — with others in Winsley Street (above the Waring and Gillows store) and in Trafalgar Buildings. They had plenty on their hands, having to cope with their own functions and at the same time devise ground rules for the future. Meanwhile the day-to-day job of running the industry was carried out in the 14 operational Divisions which had been set up.

The Divisional Controllers of those days — senior people from the private power companies and municipal undertakings — were pretty well autonomous. It was probably as well, because their job was anything but easy — especially at first. As one newcomer to the industry in 1948 recalls:

"Our Divisional Headquarters was a Victorian terraced house with a total staff of only 50 people, dealing with the operation of 23 stations (including a couple of hydros and one station with diesels from a captured U-Boat); maintaining and operating the grid; planning for and supervising the construction of new stations and the supergrid, including the wayleaving; as well as coping with the purchasing, administrative, personnel and accountancy functions."

That was only part of the job. Those Controllers had to weld together staff from jealously independent power companies and municipal undertakings plus the CEB, all with their different practices. Old loyalties and rivalries weren't easy to eradicate. One manager was heard to remark: "You'll get nowhere in this industry unless you have CEB tattooed on your backside."

Flying high

THE newly-formed British Electricity Authority and British European Airways shared the same initials. It provided a temptation for opponents of nationalisation who were quick to ask: "Which carries the more passengers?" In 1954 the British Electricity Authority became the Central Electricity Authority.



In the early days of nationalisation many of the headquarters of the new Divisions were installed in what had once been private homes. They were on a domestic scale, very different to the regional headquarters that the CEGB was later to build. The contrast can be seen by comparing the White House (top) at Cockfosters with Beckwith Knowle (above right), headquarters of the later North East Region at Harrogate, Yorkshire, and Sudbury House (above left), the Board's London headquarters near St Paul's Cathedral.



But there were ways of promoting good working relationships:

"Every Christmas we would have a social at a local hotel with a slap-up dinner, followed by each Department giving a turn. I remember a generously-built future Secretary of the CEGB dressed in ballet skirt and rugger socks doing a remarkable threesome with the equally hefty Cashier and Purchasing Officer. But the highlight was always the can-can by the girls of the typing pool, especially when the paper skirts didn't last the course!"

The effect of nationalisation was felt right down the line. A past power station manager recalls how at first there was a great deal of trepidation. "We had always felt that our company was superior to any of the others, but the giants whose coat tails we had been grabbing were disappearing to better jobs. The chaps on the floor were afraid all their earlier bonus payments would be disappearing too. But we soon found there were advantages — and not just because there were jobs up for grabs. We had always been run on a very tight budget, but now there seemed to be plenty of money for spare plant or anything else we

thought we needed. The stores had never grown so fast!"

By the mid-1950s the new industry had got well into its stride. Good progress was being made towards the targets the BEA had set. Although demand was rising rapidly, power cuts were a thing of the past. A massive amount of new plant had been built — 8,000Mw, a two-thirds increase. The first 40-mile section of 275kV super-grid was already in operation, with another 1,500 miles of 132kV and 275kV line under construction.

There was some concern about the adequacy of future coal supplies, but against that the prospects of economic oil-firing were looking more promising. What's more, there was the promise of nuclear power to come — heralded by the press as a guarantee of a cheap energy future. The BEA's predictions on that score were more cautious, but with a diversity of fuels becoming available the outlook was good. It could have seemed an obvious case for leaving well alone as far as the organisation of the industry was concerned. But it didn't work that way.

In quick succession there were two major changes. A new South of Scotland Electricity Board was set up with responsibility for both generation and distribution in that area. The BEA was renamed the Central Electricity Authority — and as an experiment in streamlining its own organisation, the North Western Division was merged with the Merseyside and North Wales Division. It showed the shape of things to come. But a much bigger shake-up was in the offing.

The Scottish change had been a political decision, but the sniping hadn't stopped there. In 1954 the Herbert Committee had been set up "to enquire into the organisation and efficiency" of the whole industry in England and Wales. Relationships between the BEA and the Area Boards hadn't always been happy. Now many of those Boards seized the chance to criticise what they saw as over-centralisation and the way the BEA had exercised responsibility as the policy-making Central Authority.

The result came in 1958. A separate Electricity Council was formed to co-ordinate policy for the industry as a whole. The Central Electricity Authority disappeared and in its place was a new Central Electricity Generating Board — still the industry's "manufacturer and wholesaler" with the task of achieving the most economic generation possible and delivering power supplies in bulk to the Area Boards for distribution to consumers.

It was a job that would give the CEGB and its staff more than enough to think about for the next 30 years.

Evolution, not revolution

IF CHANGE was needed, the creation of the CEGB in April, 1958, couldn't have come at a better time. The new Board, led by Sir Christopher Hinton, could see the opportunities that lay ahead, but major rethinking was needed to make the most of them.

The earlier post-war construction had given way to stations with 120MW sets, and that was only the beginning. When F H S (Stanley) Brown had taken over as generation design engineer in 1953, one of his first proposals was for a 200MW set for High Marnham — bigger than anything in Europe and with higher steam conditions than similar plant in the United States. Now there were plans for 300MW sets with even higher thermal efficiencies, giving more electricity from the same amount of fuel and pushing the frontiers of technology still further.

The pace of advance was escalating — alarmingly, some thought. (Within three years orders were placed for eight 500MW sets before any experience had been gained with those of lower capacity.) It was an ambitious programme, but fresh thought was needed about the right sort of organisation to carry it through.

Those weren't the only problems. Half the new 275kV supergrid was already in operation, with construction of the remaining 900 miles of line well under way. But even when complete it wouldn't be capable of carrying the power supplies of the future. The need had been foreseen. The new lines were capable of being modified to operate at higher voltages, but there still wouldn't be enough. New 400kV lines would be required, routed to serve the new "superstations" being planned.

The prospects were exciting. There was no doubt that the staff could meet the challenge. The first priority was to make sure they were organised in the best way to do it.

The original Divisions had done a good job — an understatement when looking back at the job they faced in 1948. They had been the right management size for what needed doing then, but the nature of the job had changed. Gil Blackman, later Chairman of the CEGB, recalls:

"Britain was extremely prosperous. As a country we'd never

had it so good. Electricity demand was doubling every 10 years, and with the programme ahead we couldn't continue with the industry as it was. The Divisions not only operated the power stations in their areas. They built them, purchased the coal for them — did everything. But with the enormous amount of power station building, the CEGB centralised construction in three Project Groups; and soon the 12 Divisions were merged into five Regions which could do the job more effectively."

The change into Regions didn't happen overnight — and for the staff concerned it was a period of great uncertainty. One of them remembers it well.

"At first Divisions still operated in much the same way except they were grouped under five Regional Directors with a very small staff. But it was the thin end of the wedge. Gradually more and more functions were being drawn into Regional Headquarters and by the early sixties the new organisation was taking shape. Divisional Controllers became Assistant Regional Directors, even if parts of their old organisations continued in much the same way for years to come."

Creating the Regions had its difficulties, but the problems didn't stop there. The 12 Divisions had each had their own way of running things. Now those different practices had to be standardised. One frustrated manager pinned a quote on his wall:

"We trained hard, but as soon as we were being formed into teams we would be reorganised. I was to learn later in life that we meet each new situation by reorganisation: and a wonderful method it is for creating the illusion of progress while achieving nothing but chaos, inefficiency and demoralisation."

It had been written nearly 2,000 years before — by Gaius Petronius Arbiter, a friend of Nero's!

Staff felt much the same, and the new Board recognised this. One of its members was Andrew Cooper who



The CEBG's first nuclear power stations were Berkeley and Bradwell. Berkeley (above), on the eastern bank of the Severn Estuary was officially opened in April, 1963, by the Duke of Edinburgh — at the same moment as a similar ceremony was performed at Bradwell in Essex.

realised the importance of the personnel function, especially now that labour relations had become a responsibility of the Electricity Council. A separate Personnel Department was formed under his aegis as Member for Operations and Personnel, and he didn't hesitate to make his views known — to the Board and staff.

For a short time he was also the South Eastern Regional Director, and in the first edition of the regional magazine he wrote:

"In the new organisation we shall certainly achieve the targets we have set ourselves: but we have learned enough from past experience to know that this can be done by controlled evolution far better than it can be by painful revolution."

The evolution continued. In 1961 a Transmission Construction Project Group was formed to deal with another of the urgent priorities — building the 400kV supergrid. Still further changes would come later, but in the meantime the Board had other things to think about.

Prospects were changing rapidly. So were the means of generation. In the early 1950s it was taken for granted that coal would be the main power station fuel — until the forecasts of increased requirements had both the NCB and Government Ministers worried. Suddenly it seemed that coal

shortages would continue for at least another 10 years.

A start was made on converting some stations to oil firing (or dual oil and coal) even though at the time it was uneconomic. But soon oil prices fell and more dual-fired stations were planned to help meet demand in the 1960s. Economically it was right, but it brought its own problems to station staff who had to operate the plant.

Unless combustion in the boilers was controlled carefully, acid smuts were formed which did no good to cars parked nearby or surrounding crops. Even ladies' tights suffered. But things weren't always as they seemed. A station chemist told one story:

"I had to visit a chap who had been painting some kitchen chairs in his garden. He was furious, pointing at the tiny black blobs ruining his new paintwork, and it didn't help when I suddenly burst out laughing. Then I handed him my magnifying glass and said 'Look for yourself. It's the first time I've seen acid smuts wriggling their legs in the air!' For once we weren't to blame. But those smuts stayed a problem until we got things under tighter control."

Although in the mid-fifties oil had been seen as an important new fuel for power stations, another prospect was

opening up. Nuclear power. The Atomic Energy Authority's prototype station at Calder Hall was nearing completion, but although it would feed electricity into the grid its main purpose was to provide plutonium for military purposes.

The Government could see the benefits of having a civil nuclear power programme — not least to provide an alternative energy source — and to the AEA's disappointment they gave the BEA the job of building and running the proposed stations.

The BEA had welcomed that decision, but they (and later the CEA) had major doubts about the Government's proposals that a quarter of all new power station capacity from the early 1960s should be nuclear.

It was no accident that the Government appointed Christopher Hinton, who built Calder Hall, to be Chairman of the new CEBG. He was expected to champion the nuclear cause. But to the amazement of senior engineers from the old CEA (and to the fury of people in the Ministries) he led the fight to whittle down the Government programme to a more prudent size.

It took two years before he got it down far enough, but in the meantime work was going ahead in building the first of the nuclear magnox stations. And as *Power News* reported in 1962:

Piloting his own helicopter, Prince Philip flew in to Berkeley, Gloucestershire, to open one of Britain's first two commercial nuclear power stations. At the second nuclear power station ... at Bradwell ... the Lord Lieutenant of Essex performed a similar ceremony simultaneously on Prince Philip's behalf. Welcoming the achievement of nuclear power, Prince Philip said there had been many problems. "But nothing can alter the fact that these two stations represent a triumph of research and engineering ... It is plain that nuclear power is going to play an increasingly important part in the British energy programme of the future."

At last the CEBG had a three-fuel economy — coal, oil and nuclear — with all the advantages that brought. The magnox stations with their low running costs were always "base load

Prince's sticky situation

THE best-laid plans . . . When Berkeley nuclear power station was opened the road leading to the station was resurfaced, to give the car taking Prince Philip from his helicopter to the station a smooth run.

But, as a CEBG driver recalls, things did not go too smoothly: "The opening took place on a really hot day and they had to be careful not to drive too slowly on the sticky Tarmac. Actually, I think the tyres on his car had to be changed afterwards."



Bradwell nuclear power station was built on the south east extremity of the Blackwater estuary in Essex. The site was originally a marsh, below the high tide level, so all land in the vicinity of the main buildings had to be raised.

plant" running 24 hours a day, while for the next 10 years system control engineers could use the variations in coal and oil prices to help achieve other generation by the cheapest means; and events after that showed how wise it was for the CEBG not to have all its eggs in one basket.

But in the winter of 1962 that was the last thing those engineers had in mind. A more immediate situation demanded all their energies.