

the Uginde Kuhlmann Group in France, about one-fifth by each of Steinkohlen-Elektrizität AG (STEAG) of Germany and Société Metallurgie Hoboken of Belgium. Companies in the Netherlands, Sweden, Norway and Denmark will supply under ten per cent each. The president of the Company will be Mr J. E. Leger of Uginde Kuhlmann, the secretary Mr de Roubaix (Metallurgie Hoboken) and the chairman of the management board Dr Voleker (STEAG). Uginde Kuhlmann and the Société Industrielle des Minerais de l'Ouest (SIMO) jointly developed and patented the process.

The UK Atomic Energy Authority may not be too alarmed by this news. The conversion of uranyl nitrate into uranium tetrafluoride is an important but small part of the reprocessing operation, and a drastic reduction in the cost of this process may not have much effect on the total cost of the operation. Further, reprocessing shows considerable economies of scale, and the Windscale plant is apparently much larger than the Eurochemic plant. It follows that, although the SFU plant will be able to handle all the uranium leaving the Mol reprocessor, the difference in scale may maintain the economic balance in favour of Windscale. It is also important that reprocessing capacity in the western world is considerably greater than the amount of fuel requiring reprocessing; although the advent of the fast breeder reactor may go some way to redress this balance, the immediate economics of fuel reprocessing do not seem very exciting.

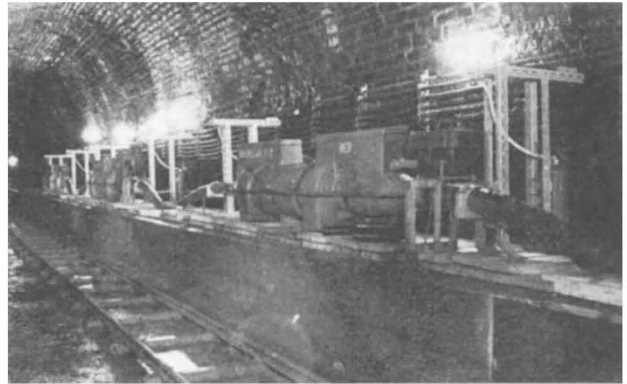
ELECTRICITY

New Use for Old Tunnel

A RAILWAY tunnel beneath the Pennines which is remembered as a major scandal of the Victorian era because of the loss of life involved in its construction is being used by the Central Electricity Generating Board for a section of the 400 kV supergrid. Until 1954, the tunnel carried the Manchester to Sheffield railway under Bleaklow Moor between Woodhead and Dunford Bridge. Its use by the CEGB means that a length of overhead cable across Bleaklow Moor, part of the Peak National Park, can be dismantled. This will be left until after the winter, and in the meantime the three-mile length of overhead cable will be available for research purposes. The overhead cable and its supporting pylons were allowed by the Ministry of Power after a public inquiry in 1963 on condition that it would be a temporary measure until the tunnel link was completed. The pylons are particularly objectionable in this part of the national park because they run along the skyline. At a cost of £2.75 million, the project represents quite a saving for the CEGB—although a similar length of overhead cabling costs £250,000, it could easily have taken £4 million to place the cables in a trench across the inhospitable environment of Bleaklow Moor.

The tunnel being used by the CEGB is in fact one of a pair of single-line tunnels which became obsolete in 1954 when the Manchester to Sheffield line was electrified and a third twin-track tunnel was opened. The old tunnels were becoming too expensive to maintain, and in any case they would have needed extensive modification to accommodate the pantographs of electric trains. Despite the age of the tunnels—the

tunnel which carries the cables was finished in 1852 and the parallel tunnel seven years earlier—the engineers of the CEGB were impressed by their good condition and the precision with which they were built. The maximum departure from linearity along the length of three miles twenty-two yards is only one foot, for example. But the tunnels were built at appalling cost. Thirty-two labourers died during the construction of the first tunnel—not only because of accidents and illness but also through riots among the work force—while twenty-five died from cholera alone during the construction of the second tunnel.



Inside Woodhead tunnel today.

The civil engineers of the CEGB found the construction of the tunnel link had unexpected problems. Because the tunnel falls within the collecting area for one of Manchester's reservoirs they were not able to hose away the two-inch crust of soot which lined the tunnel and which would have found its way into the water supply. Instead, the soot was removed by jets of compressed air and carted away. They also had to consider the possibility of a cable failure releasing oil into the cooling water, so a closed circuit cooling system is used.

At present the tunnel is carrying 2,000 MW, but there is room to double this by adding more cables. There are two cables each laid in a concrete trough through which water is flowing at 132 gallons per minute down the 1 in 200 gradient to the Woodhead portal, where it is pumped back to Dunford Bridge for cooling. The total loss in the tunnel when the two cables are on full load is 1.6 MW.

Although the CEGB had to give in to the pressure of public feeling on this occasion, the construction of the supergrid across the national park was made easy by the existence of the obsolete tunnel. The only case of a tunnel being purpose-built for the grid is in Hampshire where the CEGB has dug a tunnel under Southampton Water. Considering the difficulties involved in laying cables in a trench across Bleaklow Moor it seems likely that if the railway tunnel had not existed the overhead cables would have become a permanent feature.

TRAFFIC PLANNING

Are London Roads Viable?

SERIOUS criticisms of the Greater London Council's proposed network of motorways in London are made in a recent report by an independent working party