

2. Heavy Electrical Equipment

a) The Opportunity

The worldwide rush to replace oil-generated energy has focused attention on Australia's huge coal resources. Australia is using its coal as the basis for a massive expansion of its generating capacity at relatively low cost (as little as 1.8 cents per kW hour). The need arises from:

- i) the growth in consumer demand, which is averaging 6 per cent per year; and
- ii) the demand for relatively cheap electricity by energy intensive industries (such as aluminum smelters).

Current electric power development is taking place to an unprecedented extent, with the main activity in eastern Australia. Over the next 10 years, New South Wales will be investing \$8.6 billion, Queensland \$7.3 billion, and Victoria \$6.7 billion. Queensland's generating capacity will rise from 3,000 mW to 8,000 mW by 1990, while Victoria's will increase from 5,210 mW to 9,280 mW in the same period.

Concurrently there is a tremendous requirement for new transmission lines, auxiliary switching equipment and heavy electrical equipment. New South Wales plans 200 km (124 miles) of 500 kV and 650 km (404 miles) of 330 kV transmission line by 1984. Victoria plans 538 km (334 miles) of 500 kV line by 1984, and Western Australia is examining a 1,600 km (994 miles) high voltage D.C. line from Perth to the Pilbara. On the user side, two new aluminum smelters are planned for the Hunter Valley N.S.W.; the Alcan smelter in N.S.W. is being doubled in capacity; the Alcoa smelter in Portland, Victoria is under way, and Alcan is planning a new smelter for Queensland. There is also significant activity in the development of mines, both open pit and underground, in Queensland, N.S.W. and Western Australia and, to a lesser extent, in South Australia. Open-pit mines require large amounts of energy for their drag lines, while underground mines need large amounts of electricity to operate their mine winders.

The tremendous growth in electric power generation will also affect design construction consultants. Engineers of all disciplines are in short supply. The power utilities that generally design and manage their power stations cannot expand their capabilities. For the first time, N.S.W.