# WHERE SHOULD NUCLEAR POWER STATIONS BE BUILT?

To obtain the best value from nuclear power stations, they should be built close to the cities where most of their output is to be used. To meet present safety practices the stations must in most cases be built away from heavily populated areas. Indications that this contradictory situation may change now that experience is accumulating and many stations are being planned were given during intensive discussions in Vienna at a symposium organized during March by the Agency on "The Containment and Siting of Nuclear Power Plants".

Several points emerged from a week of intensive exchange of views by 250 scientists and engineers from 28 countries and six international organizations. One was that national plans for atomic power are rapidly multiplying and that estimates of the capacity to be installed within the next twenty years are being raised considerably. Another was that the attention being paid to safety considerations reduces serious hazards, and that this factor is bringing about changes in siting decisions. Above all it was clear that even though nuclear power has become an accepted industry safety will remain a paramount consideration and will not be sacrificed to economic aspects.

Heavily populated countries which have already used remote sites in making their first approaches to nuclear energy have to bear in mind factors rather different to those in countries where there is still space away from populated centres. One of the nations in the first category is the United Kingdom, from which F.R. Farmer's paper "Siting Criteria — a New Approach" aroused great interest. He said that in the UK it was already clear that reactors must attain a standard of safety which would permit complete freedom in siting, and the same situation would soon be reached in other countries. When this goal was reached, site categorization would disappear and all reactors would need to meet a single high standard if they were to play a significant part in a power network. Less populated sites might be reserved for development of new types. He discussed a method of assessment taking into account probabilities of failures, assessment of consequences related to factors such as accumulated years of reactor operation and the release of radioactive iodine.

J.E. Robb (USA) stated that there were now almost 60 nuclear power stations planned, on order, under construction or operating in the United States. By 1980 the installed electrical capacity could reach 150 000 megawatts (a megawatt = a million watts), a figure twenty per cent higher than estimates made only last year. In his opinion the principal factors affecting siting included

supplies of cooling water, land costs and availability, transportation of heavy components, links with transmission systems, population distribution, taxes and labour, together with physical considerations such as meteorology, geology, possibility of earthquakes, and high winds. Some of these could be extremely important for large power stations. He considered that safety had been so well defined that plants could be located anywhere except in major metropolitan areas.

G. Hake (Canada) gave details of a large complex of nuclear power reactors planned in the neighbourhood of Toronto. It was proposed to instal eight units, each with a thermal capacity of 1750 megawatts, about 7 km from the outskirts and 30 km from the centre, of an area with one of the fastest growth rates in North America. F.C. Boyd (Canada) outlined the concepts of safety developed by the Control Board in his country. It was hoped that operating experience would give assurance of the low probability of equipment failure, so that requirements for containment and siting could be reduced.

Among the countries where studies have been made for the sites of proposed nuclear power stations are Argentina, Mexico, Spain and Yugoslavia. E. Evans Morgan (Argentina) described a site 100 km north-west of Buenos Aires where a station of 500 megawatts could be installed in 1971-72. In Mexico a plant could be located to the south-west of Mexico City, according to F. Súcar Súcar, and the practicability of incorporating a station of 300 megawatts into the national grids had been assessed. A. Alonso (Spain) analyzed the sites of three projected stations, two of them in the interior and one on the Mediterranean coast. Proposals were for a pressurized water, a boiling water and a graphite gas-cooled reactor. In Yugoslavia comprehensive studies had led to the selection of several favourable sites suitable for a plant with an output of 200-300 megawatts. J. Obradović said that many of the criteria were also used for conventional power stations, but there had to be additional thought for design against earthquake damage and disposal of waste into rivers.

At the final session a panel discussion brought out many points and outlined subjects for further research. The Chairman for the occasion, M. Osredkar (Yugoslavia) considered that the symposium had shown that important advances had been made in understanding technical views and in dispelling fear of nuclear power.