

CANADA'S ATOMIC ENERGY PROGRAMME

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Atomic Energy Authority. Moreover, the same Authority has been advised that the quantities could be increased should this be desired.

"On the basis of present information it is expected that certain uranium mines will be able to produce in excess of the rates specified for delivery in their contracts with Eldorado. Every effort will be made to sell this surplus uranium to individual friendly countries and to organizations of friendly countries such as Euratom and the Organization for European Economic Co-operation. These sales will be made under agreements for co-operation in the peaceful uses of atomic energy. As announced in the House some days ago, such an agreement has now been entered into with the Federal Republic of Germany. Negotiations for a similar bilateral agreement with the Confederation of Switzerland are now under way. Uranium sales will be made under these two bilateral agreements. At the Conference of the International Atomic Energy Agency held in Vienna in October the Canadian Delegation advised the Conference that Canada could make available to the Agency substantial quantities of uranium.

"The nature and scope of the research and development programme under way at Chalk River are described in detail in the annual report of Atomic Energy of Canada Limited which was tabled on October 15. The objectives of the programme are fourfold; first, to develop economic nuclear power in order that nuclear power may be available for use in Canada in those regions where a new source of energy will be required to supplement existing conventional sources; second, to carry out this development in a manner which will provide for the most effective participation of the utilities and the manufacturers; third, to expand the civil market, both domestic and foreign, for Canadian uranium; fourth, to produce and market radioisotopes for use in industry, medicine and research, and to develop new uses for these radioisotopes.

"The development of economic nuclear power involves three main areas of activity, fundamental research, applied research, and the design, construction and operation of demonstration nuclear power plants. These activities have a common objective, the development of a power reactor technology based on the use of natural uranium as a fuel and heavy water as a moderator, the technology which Canada pioneered so successfully with the NRX reactor.

"The fundamental research programme under way at Chalk River consists of pure research in physics, chemistry, biology, physical metallurgy, and associated sciences. It is necessary that this programme be continued and expanded in areas of particular interest if Canada is to maintain her position as one of

the countries most advanced in the science of atomic energy, and if Canada is to continue to play an appropriate part in the programme of international co-operation in the field of atomic energy.

"It is now recognized in all nuclear programmes that the economics of nuclear power can only be demonstrated by designing, engineering, constructing and operating nuclear power plants. Canada has two power reactor projects under way, the design and construction of a demonstration power reactor known as the NPD with an output of 20,000 kilowatts electric, and a design study for a power reactor with an output of 200,000 kilowatts electric.

"Construction of the NPD reactor was suspended in April last in order to incorporate in the design certain new and desirable features. The work of redesign was completed successfully late in 1957. Fabrication and construction will now be resumed. It is expected that the NPD reactor will be in operation early in 1961. This project is being carried out in co-operation with the Hydro-Electric Power Commission of Ontario and the Canadian General Electric Company. While it is not expected that the NPD station will produce power at competitive costs, it will demonstrate reliability of operation; it will provide information on fuel element design and performance, and it will serve as a prototype for nuclear stations with a larger power output.

"Reference has been made in the annual report of Atomic Energy of Canada Limited to the results of the preliminary design study for a nuclear power station with an output of 200,000 kilowatts electric. A conceptual design was proposed in the report which offers good promise of producing power at an acceptable cost. However, the proving-up of the engineering and economic feasibility of the conceptual design proposed in the report will require a large and comprehensive development programme. This programme will take a period of from three and one-half to four years for its execution. The Government has now approved the carrying out of such a programme.

"Atomic Energy of Canada Limited will set up a nuclear power plant division in Toronto which will be responsible for directing both the NPD project and the development programme for the large reactor. All the Canadian utilities and those manufacturers who are now engaged in the programme or who have an interest in the programme will be invited to contribute staff to the new division. In this way we hope to provide for the most effective participation of the utilities and the manufacturers in the development of economic nuclear power.

"It is estimated that the net cost of the research and development programme, including the cost of the two power reactor projects, over the period April 1, 1958, to March 31, 1962 will be \$140 million. This estimate has been established after allowing for certain