

Section 2.—Research in the Atomic Field*

Atomic Energy of Canada Limited (AECL), a government-owned Crown company, operates Canada's main atomic energy centre near the town of Chalk River, Ont., 130 miles west-northwest of Ottawa. The company has a nine-man Board of Directors that includes representatives of private industry, public and private power companies, and the universities, and is engaged in four main activities: (1) the development of technology for economic atomic power; (2) fundamental scientific research in the atomic energy field; (3) operation of nuclear reactors and separation of nuclear fuels (plutonium and uranium-233); and (4) production of radioactive isotopes and associated equipment, such as Cobalt-60 Beam Therapy Units for the treatment of cancer.

The company is collaborating with the Canadian General Electric Company Limited and The Hydro-Electric Power Commission of Ontario (HEPC) in the building of an experimental atomic power station, to be known as NPD (Nuclear Power Demonstration), near Des Joachims on the Ottawa River, 12 miles above the Chalk River plant. The decision to build NPD followed a power reactor feasibility study, started late in 1953 and carried out by engineers of AECL, HEPC, the Montreal Engineering Company Limited, the Shawinigan Water Power Company, the British Columbia Electric Company Limited, and the Brazilian Traction, Light and Power Company Limited. The power reactor is expected to generate 20,000 kw. of electricity when it goes into operation in 1961. To carry out a development program for a 200,000 kw. power station known as CANDU, Atomic Energy of Canada Limited in 1958 set up a Nuclear Power Plant Division in Toronto. Ontario Hydro and various private companies have contributed staff to the division.

To ensure that the various publicly and privately owned utilities are kept fully informed of the progress being made, the Government set up in 1954 an Advisory Committee on Atomic Power Development on which the various power producers throughout the country are represented. The committee, which meets periodically at Chalk River, studies the research results obtained at that centre, receives complete information on the NPD station and large power reactor studies, and assists in evaluating the economic importance of atomic power in various regions of the country.

In 1955, the Industrial Assistance Office was set up at Chalk River to create an interest on the part of private companies in the possible applications of atomic energy in general and of atomic power in particular.

Development of the Atomic Energy Program.—The program had its beginning in 1942 when it was decided to set up a Canadian-United Kingdom project in Canada, under the administrative control of the National Research Council of Canada. British, French and other European scientists doing nuclear research moved to North America early in World War II to work on an atomic weapon—the possibility of which became evident when the first recognition of nuclear fission was announced in Germany in 1939.

The United States project used the more readily available graphite to moderate its reactors and the project in Canada was assigned the task of trying heavy water as a moderator so that all possible routes to the production of plutonium for bombs would be tried. In 1944 the Canadian-United Kingdom team moved from the University of Montreal, where preliminary studies had been carried out, to a site on the Ottawa River, about five miles from the town of Chalk River.

On Sept. 5, 1945, ZEEP went into operation. It operated at a mere 10 watts but made possible a study of the value of a heavy-water natural uranium system and it has continued to be useful for studies of fuel rod arrangements. Two years later, on July 22, 1947, the NRX reactor went into operation. It was then, and so remained for several years, the most powerful research reactor in the world. NRX still plays a leading role by making possible important experiments relating to the development of atomic power, enabling fundamental properties of atoms and nuclei to be determined, and producing

* Prepared by Clyde Kennedy, Public Relations Officer, Atomic Energy of Canada Limited, Chalk River, Ont.