The very small low-energy nuclear reactor -- SLOWPOKE -- brought into operation at Chalk River in 1970 has been moved to the University of Toronto for use principally in the neutron-activation analysis of materials at low levels of concentration, such as mercury in foods. A second SLOWPOKE, with some refinements, has been brought into operation at AECL Commercial Products in Ottawa.

The aluminum vessel forming the core of the NRX reactor at Chalk River since 1954 had corroded in some areas and was replaced at the end of 1970 in an operation that was most satisfactorily completed in 130 days. Preparations have been made for replacing the reactor vessel in the larger NRU reactor at Chalk River, which has operated since 1957.

Over the past few years there has been growing public concern about pollution of the environment. For many years AECL has had an environmental research branch at Chalk River, and has been able to study the problems of radioactive-waste management in a secluded area. This area is on bedrock that forms a basin with only one water outlet, a small creek that is monitored to assure that the outflow meets the radiation levels permissible for drinking water. Should such levels be approached, it is possible to raise the weir level to increase the dilution or to process the whole stream. Glass blocks containing high levels of strontium-90 and caesium-137 were buried there in 1959 and the levels of activity in the surrounding ground-water have been followed and found to be satisfactorily low. Such a method of managing wastes appears preferable to any disposal in an area at a distance from an operating plant. Radiation levels are far below those at which biological effects can be expected, but by the use of sensitive detectors it is possible to follow any movement of radioactivity within the management area. It seems likely that the CANDU reactors will be easily managed without imposing any burden on the environment. In order to obtain independent monitoring, AECL many years ago passed over to the Department of National Health and Welfare responsibility for the radioactive monitoring of public water supplies, discharges into rivers, and radioactivity from the atmosphere that may enter milk supplies by settling on vegetation.

Fundamental research has always been, and must remain, the basis of AECL's development. AECL's primary research tools are the reactors. The three large reactors, NRX, NRU and WR-1, are major research installations providing facilities in their cores for irradiation of materials over extended periods. Special isolated fuel channels, or loops, are provided for the "in-reactor" testing of different types of fuel and coolant systems -- this testing being fundamental to further development of the Canadian power-reactor program. Additionally, horizontal holes through the reactor shielding allow intense neutron beams to be directed to various test rigs. One such rig (in NRU) includes a fast-beam "chopper", allowing time-of-flight studies on neutron interactions with matter. In-reactor loops at CRNL and WNRE are complemented by out-of-reactor test rigs, which, apart from the radiation field, simulate reactor fuel-channel conditions.