to the benefit of Canada and of other countries. In large part by virtue of its position as a supplier, Canada is able to further measures to ensure that international nuclear cooperation does not contribute to the danger of nuclear proliferation.

The Nuclear Fuel Cycle

An understanding of the nature of the dilemma might be aided by a brief description of the materials which constitute the hazard. Conventional power stations use the combustion of oil, gas or coal to produce electricity; nuclear power reactors produce electricity using the fission of uranium 235. Natural uranium as mined, consists essentially of two kinds of uranium atoms, 99.3% is uranium 238, and .7% is uranium 235. Fission occurs when the nucleus of a U-235 atom is split by a neutron; heat is produced and additional neutrons are emitted from this reaction which will, in turn, when slowed by a moderator (such as heavy water), split the nuclei of other U-235 atoms. This process will continue indefinitely provided the conditions are exactly right.

A nuclear power reactor is essentially a furnace where this self-sustaining chain reaction can be controlled, and the massive amounts of heat produced put to useful work. In a typical case the heat produced by the fissioning of U-235 is removed from the fuel elements in the reactor core by the coolant, which flows over them. The coolant is then piped through a heat exchanger where it turns water in a secondary circuit into steam. From this point on a nuclear power station is the same as a conventional power plant, for in both cases the steam produced is used to drive a turbine generator which produces electricity.