Point Lepreau Genera

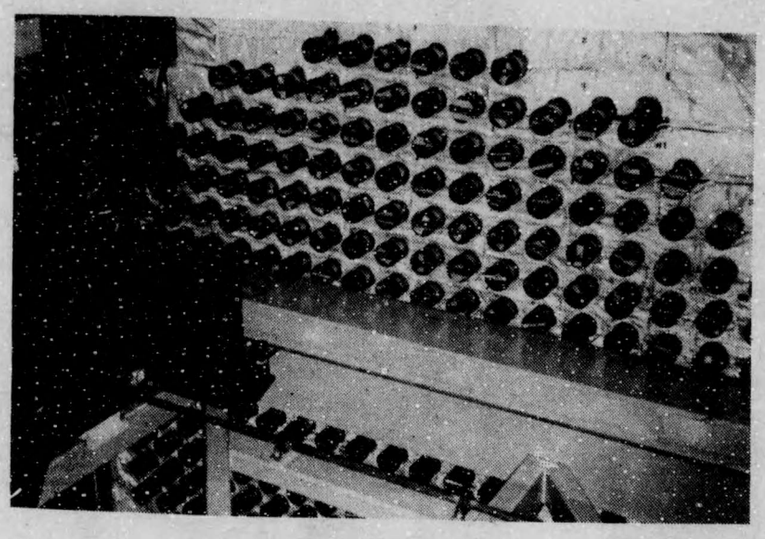
New Brunswick Enters t

It is the age of nuclear power and here in New Brunswick it is becoming more apparent. While the Point Lepreau nuclear power plant near Saint John is loading nuclear fuel into the fuel channels, New Brunswickers are still wondering how safe nuclear power is going to be and who is footing the plant's bill. But that's only the beginning, a second nuclear unit is being planned and has been for some time. The experts say this is New Brunswick's big break and that we can pay off our debts by the cheap costs of nuclear power in the future. However, a debt of $1.2 billion dollars which was originally forecast at about $500 million, is now our worry.

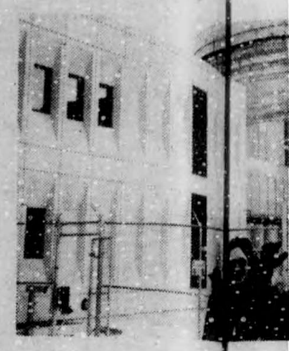
What can we do about it? Not really too much except sit back and look hopeful. Here at the *Brunswickan*, we organized a day of touring the plant to see exactly what would cost so much and what safe measures are being taken. "Seeing is believing" but in this case you need to know how nuclear power is produced in order to recognize its faults and advantages.

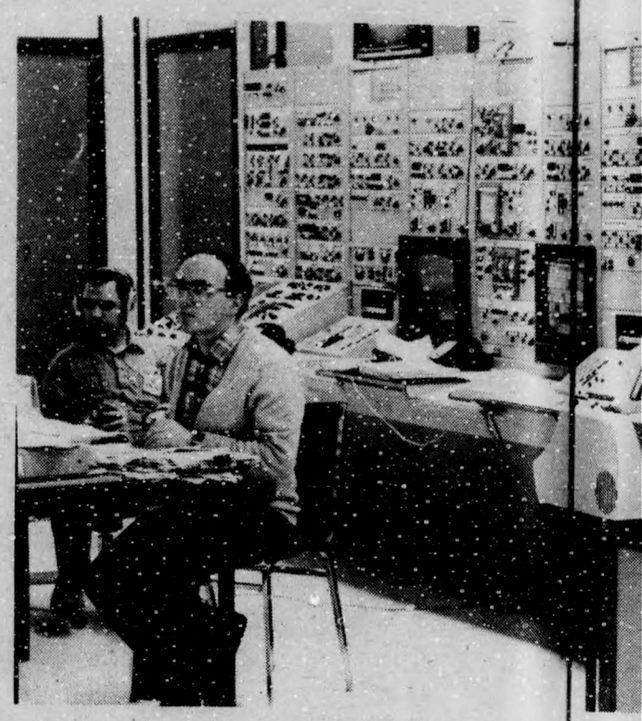
The workings of the plant itself seem complex but stem from only a tiny particle, the atom. Inside each atom is a solar system, where negatively charged electrons orbit around a nucleus composed of positively charged protons bound to uncharged neutrons. Certain atoms are radioactive, which means that neutrons fly out of them. If a neutron travelling at a slow speed crashes into a radio-active atom, the atom splits. Heat is released and some neutrons escape. If a neutron can be slowed down so that it will strike an atom at a correct speed, split it, create energy and free more neutrons to do the same thing, you have a self-sustaining chain reaction. Atom-splitting or fission, is achieved in a nuclear reactor by immersing a radio-active fuel in a substance that moderates the speed of the neutrons. In the CANDU reactor the fuel is natural uranium, and the moderator is heavy water.

Precautions are taken with the workers.



A remotely controlled fueling machine, positioned at the reactor face. Fuel bundles are changed while the reactor remains "on power."





Control room.

Since the atom-splitting process produces radiation as well as heat and neutrons, New Brunswickers have every reason to be nervous about safety.

In addition to the surveillance normally carried out by the utility, nuclear generating stations are monitored by the Atomic Energy Control Board. Radiation is continuously measured by a system of fixed and portable monitors located throughout the station.

Experience with CANDU stations confirm that a person living at the boundary of a nuclear station might receive an additional annual radiation exposure equivalent to that received by a passenger on a flight from Saint John to Vancouver as a result of increasing natural background radiation at higher altitudes.

Some safety measures are the safety systems which exist solely to limit radioactive release to the environment in the event of unusual operation. The Lepreau station contains two shutdown systems as well as containment and an emergency core cooling system. Back up emergency water and emergency power systems are provided.

These systems are different in design and operation and are independent of the process systems, including the reactor regulating system. Safety steps are designed to automatically shut down the reactor if any unusual condi-