cost of perhaps 120 millions. These are supported by studies of other systems not considered to have advanced to the 'proper stage . The first project is the Nuclear Power Demonstration plant (NPD-2), a 20 megawatt unit under construction near Rolphton, Ontario. The second is the 200 megawatt CANDU reactor for the Douglas Point Station on the eastern shore of Lake Huron. Both of these stations use reactors of the heavy-water moderated and cooled pressure-tube type and both will be fuelled with natural uranium. The third project is a design study with associated development work on an organic cooled heavy-water moderated reactor. The fourth project is a study of the application of the small size pressurized-water or boiling-water enriched-fuel reactor systems to Canadian conditions, particularly remote northern sites.

"These four projects are designed to meet the needs of the very large power systems where units of 200 megawatts and upwards may be installed; the medium-size systems where say 50 to 150 megawatt sizes are needed; and the very small remote dual-load, heat and electricity sites.

NPD AND CANDU

"The first two projects may be coupled together, as they really form a prototype and a full-scale unit of basically the same design that is particularly applicable in the larger sizes. NPD is progressing very well; it is virtually on schedule and the costs are following estimates as predicted. This plant should be near completion at the end of this year and we can see no reason why it should not be operating by mid-1961. It is being designed and built by Canadian General Electric Company Limited for operation by Ontario Hydro as a joint undertaking with AECL. This project is not a commercially economic unit. It is a demonstration unit. It will demonstrate the practicability of some of the basic parts of the system and will demonstrate the real economics of fuelling a reactor of this type.

"The 200 megawatt Douglas Point Project is going ahead without waiting for all the results that NPD is expected to produce. This decision to proceed was based partly upon the confidence of the design staff due to the success of the CGE design work and to the results of the fuel-development programme at Chalk River, and partly upon the realization that full-scale plants must be built and operated before real costs will be known.

"The third project, which may result in the construction of an organic cooled heavy-water experimental reactor (OCDRE), is a contract with the Canadian General Electric Company Limited to continue the development of a reactor system they proposed. Due to the nature of the organic materials proposed for cooling, lower capital costs per kilowatt are expected and higher efficiencies due to higher temperatures are predicted, as compared to the heavy-water cooled systems. On the other hand, fuelling costs will be somewhat higher. This reactor system, if successful, should be particularly applicable to the medium sizes, 50 to 150 megawatts. In sizes of 200 megawatts and upwards, the neutron economy of the heavy-water cooled reactors seems to have advantages that outweigh those of the organic materials. A very active design and development programme is under way at Canadian General Electric, coupled very closely with development work at Chalk River on organic materials. A decision to proceed with the final design and construction of a reactor of this type will be considered within the next year. The USAEC and Euratom are taking an active part in this programme, with interchange of staff and information and attendance at periodic joint meetings.

"The fourth project is primarily the compilation of information generated in the U.S. and made freely available to Canada by the USAEC. Canadian Westinghouse Company Limited have contracted to review all the pertinent information on the small so-called package reactors which have been developed for possible application at remote sites. This type of plant, which utilizes fairly high enrichment, has been considered in detail, assuming the conditions of typical Canadian sites. The project is nearing completion and should be of specific interest to those concerned with the development and defence of the north.

STEAM-COOLING

"Study projects of varying complexity and advancement are common in the Reactor Research and Development Division of AECL. Such systems as gas-cooled reactors have been studied and this line has led to the possibility of steam cooling a heavy-water moderated reactor. This type of system looks very promising but it is some years away and, even if pursued jointly with the U.K., it is unlikely that an experimental reactor would be proposed in less than two or three years. If everything went well, this would be followed with a prototype and then a full-scale plant. This type of system would be best in the very large sizes and, although it could operate on natural uranium, some fuel enrichment might prove more economic.

"...In Canada the economic incentives for nuclear power, with one notable exception, are very much like those in the U.S. Some areas still have undeveloped hydraulic resources and these, where they are reasonably close to load centres, will be installed in preference to nuclear power. A large part of the country has abundant supplies of fossil fuels that allow lower-cost power production than can be met with any nuclear plant that may be developed in the near future. Southern Ontario is the one area where atomic power seems immediately

(Continued on P. 6)