

Commissioning of a new out-of-reactor research facility designed specifically for investigation of the BLW and the Advanced BLW reactor concepts was completed in 1971. This test rig uses Freon as a coolant, and is designed to simulate a variety of power-reactor conditions. With three full-size test sections, the loop will provide realistic test facilities for any CANDU type of fuel configuration at present envisaged. The use of Freon (with its low vapour pressure) as a modelling fluid to simulate water provides a considerable saving in both construction and power costs.

A further major research tool at Chalk River is the 10-megavolt "MP" Tandem Van de Graaff Accelerator. Among its many uses are precise studies of the structure and excited states of heavy atomic nuclei. Data acquisition and analysis equipment associated with the accelerator is on-line to powerful data-processing systems. The accelerator is undergoing modifications to uprate the machine to 13 megavolts, which will provide higher particle energies and considerably increase its research potential.

In the field of technical information, the introduction of mechanized systems is progressing. The main CRNL library -- Canada's national repository of nuclear literature -- has successfully introduced computer control of book circulation and periodical renewal and budgeting. Experimental operation of a computerized current-awareness service has started -- initially serving AECL staff but later to be extended on a national basis. Additional technical information activities included the co-ordination of the 17 Canadian papers presented at the fourth United Nations Conference on the Peaceful Uses of Atomic Energy, and preparation of supplementary material for this conference.

As previously mentioned, the Whiteshell Nuclear Research Establishment is specifically oriented toward investigation of materials for advanced reactors. The establishment's research reactor, the organic-cooled WR-1, is undergoing modification to replace its stainless-steel fuel channels with channels of Ozhennite -- 0.5. The comparative "transparency" to neutrons of zirconium will permit a reduction in fuel enrichment and a 50 percent increase in neutron flux. Additionally, the reactor core is being increased in size from 37 fuel sites to 54, improving the flexibility and capacity of the reactor to deal with experimental programs. Two in-reactor organic loops have been commissioned in WR-1, both of which, at 4.5 megawatts each, are of higher power than the existing water-cooled loop. A fourth loop is under construction.

Out-of-reactor loop work at WNRE has been devoted to investigation of liquid-metal coolants, which offer higher temperatures than the organic liquid. Three lead-bismuth loops (one at 630°C, the others at 800°C) have provided much information on liquid metal heat-transport systems, and a fourth facility using molten lithium is being commissioned.

A terminal unit and data-link at Whiteshell, installed in 1971, now provide the WNRE with direct access to CRNL's powerful CDC 6600 computer system. A similar link serves power projects.