CANDU Research and Product Development

The neutrons in the reactor core are used to irradiate advanced fuels, materials and components in special test sections or "loops" that reproduce a nuclear power reactor's operating environment. The materials and components are then examined and tested in shielded "hot cells" to obtain information on their performance under power reactor conditions. Irradiation research and proof-testing has been an essential element in ensuring a successful CANDU nuclear industry.

Neutron Beam Facilities

Beams of neutrons are guided to experimental stations outside the reactor core, where they are used as powerful probes of materials. This technique—pioneered in Canada by Canadian Nobel Laureate Bertram Brockhouse in the 1950s and now used all over the world—is called neutron scattering.

A suite of neutron instruments in the CNF will provide Canada with state-of-the-art capabilities for research in wide-ranging fields of science and engineering. The cold source, which is a key element of many European facilities, will open new fields of research for Canadian scientists.

CNF Facilities for Advanced Materials Research

6 thermal beams in the reactor hall

1 cold source feeding seven neutron guides

1 thermal source feeding two neutron guides

1 new spectometer directly viewing the cold source

5 instruments relocated from NRU

5 new instruments in the Guide Hall

Provisions for 23 instrument stations

CNF Facilities for CANDU Research and Product Development

Horizontal Fuel-Test Facilities	3 test sections, each with up to 3 CANDU bundles, connected to 2 loops
	Bottom test section can be replaced with a high integrity test section for future severe fuel damage Blowdown Test Facility (BTF) tests
	CANTHERM advanced fuel channel capability
Vertical Fuel-Test Facilities	1 test loop with 2 test sections for multi-element partial fuel bundles
	Space to connect one test section to a second loop
	Space for a BTF loop system
Materials Irradiation Facilities	4 split-core sites
	4 fast neutron sites
Hot Cells	1 general purpose cell
Service Irradiation Facilities	6 vertical tubes including: 1 hydraulic rabbit system Provision for a pneumatic rabbit system