## 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.

## CNF Facilities for Advanced Materials Research

6 thermal beams in the reactor hall

1 cold source feeding seven neutron guides

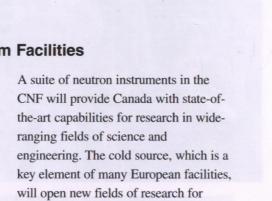
1 thermal source feeding two neutron guides

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



Canadian scientists.

## **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	1 test loop with 2 test sections for multi-element
Facilities	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	6 vertical tubes including:
Facilities	1 hydraulic rabbit system
	Provision for a pneumatic rabbit system

