



## Delayed Hydride Cracking Facility

CNL's Delayed Hydride Cracking Facility (DHCF) is located at its Chalk River Laboratories. The DHCF has the capability to test un-irradiated and irradiated zirconium specimens, machined from CANDU® reactor pressure tubes and other zirconium-alloy materials. Cantilever beam specimens are tested for cracking in the radial direction of a pressure tube, but growth rate tests may also be performed in the axial direction on compact toughness specimens.

Testing available within the DHCF includes:

- Delayed hydride cracking growth rate in the radial or axial directions
- Threshold stress intensity factor for crack initiation from a crack
- Threshold stress for crack initiation from a flaw
- Hydride fracture stress under overload conditions
- Crack initiation from a nominally smooth surface, and
- Other tests to simulate reactor operation thermal load cycles

The DHCF includes large ovens for testing of multiple cantilever beam specimens and single specimen rigs for testing individual specimens.

Qualification testing of pressure tubes manufactured by two suppliers has recently been completed in the DHCF. The test results were part of an extensive data package to assess the manufacturing capabilities of these suppliers. The DHCF supports the continued licensing of existing nuclear power plants and the development of safety enhancements in partnership with the nuclear industry.

The Delayed Hydride Cracking Facility would welcome other partnerships with industry and universities.

