

Reactor operators can introduce CANFLEX bundles alongside the existing 37-element fuel bundles during normal on-power refuelling.

Rigorous Qualification Testing

CANFLEX development began in 1986 and, since 1991, AECL has partnered with the Korea Atomic Energy Research Institute (KAERI) to complete CANFLEX development, qualification testing and analysis.

Testing and analysis have included:

- irradiation in AECL's NRU research reactor
- thermalhydraulic qualification in both water and Freon
- fuel handling and fuel channel qualifications
- endurance testing
- measurements of the reactor physics parameters in AECL's ZED-2 research reactor

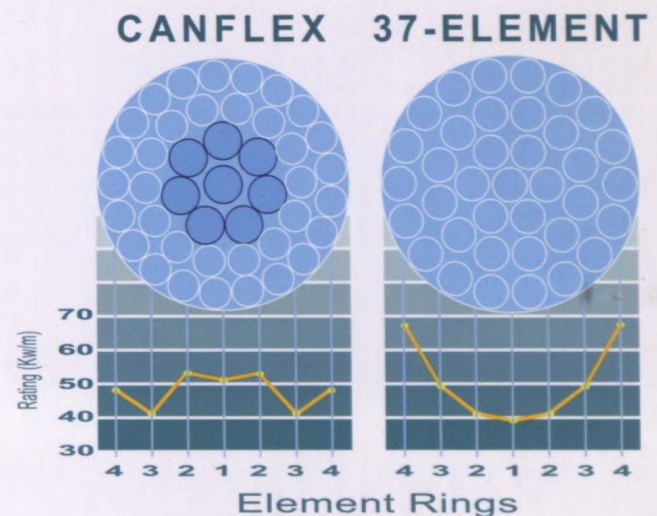
Approved by the Atomic Energy Control Board (AECB), a two-channel, 24-bundle, demonstration irradiation using CANFLEX NU began in September 1998 at Point Lepreau NGS, New Brunswick, Canada. The first four bundles were discharged in March 1999, and a further refuelling took place in August 1999. Fuel handling experience, irradiation data and in-bay photographs show that the in-reactor performance of the CANFLEX NU fuel met all design criteria and that it is fully compatible with existing CANDU reactors. Full-core implementation has been supported by a water CHF test in preparation for full-core safety analysis.

Through all phases of design, testing and validation, a comprehensive CANFLEX information database has been compiled, and extensive computer modelling has been done. The database and computer modelling capabilities will ably support future large-scale fabrication and licensing.

The Transition to CANFLEX

Following full-core analysis, CANFLEX NU will be available for commercial use by the end of 2000.

CANFLEX NU has been designed to have handling characteristics that are similar to those of the existing 37-element fuel—which continues to operate exceptionally well within its design parameters. These characteristics provide the operators with the ability to introduce CANFLEX NU bundles during normal on-power refuelling.



Comparison of element ratings for CANFLEX and 37-element bundles with NU fuel

CANFLEX NU bundles can be used in conventional CANDU fuel handling systems with no equipment modifications, and can be phased in over a period of time during normal on-power refuelling, with no waste of existing fuel. In fact, as demonstrated at Point Lepreau, fuel channels continue to operate normally when containing a mix of both CANFLEX NU and 37-element fuel.

A CANFLEX fuel design manual and performance specification will be supplied to customers under a licensing agreement.