



In November 2019, staff at KHNP's Wolsong Nuclear Plant (pictured) began loading a new fuel bundle design to increase safety margin.

Maiden voyage for COG's enhanced safety fuel bundle design in a CANDU-6 reactor

KHNP's Wolsong Nuclear Plant loads its first 37M fuel bundle following regulatory approvals in November 2019

A modified fuel bundle design developed to improve heat removal efficiency and increase safety margin was loaded into the Korea Hydro and Nuclear Power (KHNP), Wolsong plant, in November 2019, marking a first in a CANDU-6 reactor.

On Nov. 22, KHNP received approval from the Korean nuclear regulator to proceed with placing a 37-element (37M) fuel into Wolsong Unit 2. The technology had previously only been used in Ontario CANDU plants.

Beginning in 2012, COG's Safety and Licensing R&D program undertook research to improve heat removal in fuel under accident conditions, thereby increasing safety margin in CANDU plants. After successful implementation at Ontario Power Generation's Darlington and Bruce Power plants, KHNP in collaboration with COG, began to look at ways to use the 37M design for its three CANDU-6 reactors. Stern Laboratories also played a key role in advancing 37M research by proposing the design modification and performing state-of-the-art tests to demonstrate the effectiveness of the modified fuel bundle under many different combinations of fuel channel flow, pressure, temperature and power.

37M bundles feature better thermal-hydraulic properties as the smaller diameter of the central fuel element provides better heat-removal capability.

A three-stage process preceded the loading of the fuel bundles at Wolsong. This involved safety analysis; assessment of compatibility with interfacing components and systems and in-reactor testing, to ensure that Korean regulatory requirements were met. It also enabled a seamless transition from Wolsong's original fuel bundles to the new design. COG's R&D team supported this process by providing KHNP with relevant safety and sensitivity assessment data.

KHNP celebrated the regulatory approval and successful Unit 2 loading of the 37M bundle with a ceremony at Wolsong on Nov. 26.

Additional 37M fuel bundles are scheduled to be loaded into Wolsong Units 3 and 4 in the coming months.