Kathy Charette stands in the CANDU Owners Group lobby where a fuel channel model represents the significant contribution to innovation in CANDU operation achieved through COG member collaboration.

New Frontiers

OPG's Kathy Charette is leading COG's Fuel Channel Life Management program into the future

In almost 30 years at Ontario Power Generation (OPG), Kathy Charette worked for one company but experienced several careers. To the good fortune of the CANDU Owners Group, the same 'itch' that drove Charette to try her hand at several things at the utility also inspired a secondment at COG, managing the fuel channel life management (FCLM) program.

At OPG, Charette, a mechanical engineering graduate from Waterloo, began her career as a systems engineer. She worked as a pressure boundary specialist and then moved into management roles within Nuclear Oversight, Procurement Engineering and Major Components Engineering. From there, Charette was appointed to the Fuel Channel Life Confirmation Project, where she was responsible for providing OPG project management and technical oversight of COG FCLM joint projects.

FCLM research has succeeded in improving confidence in the fitness-for-service of CANDU pressure tubes and developed industry standards used worldwide to confirm pressure tube integrity. The work includes accelerated aging of actual reactor components removed from service and then tested to evaluate material properties.

It has increased understanding of fuel channel material properties and provided experimental evidence to support risk-informed decision-making. This is accomplished through the development of new probabilistic methodologies and predictive models that are used in the evaluation of fuel channel fitness for service.

Charette says the program is a "game changer" for the industry.

In fact, one significant outcome of the program is pre-refurbishment extended operation at both OPG's Darlington plant and at Bruce Power. It means more low-carbon electricity to Ontarians from the original capital investment into the plants. It also gives the operators the needed flexibility to better coordinate their refurbishment / life extension programs. FCLM results have also factored significantly into OPG's application to operate Pickering Nuclear until 2024. The regulator is expected to make a determination on the renewed licence later this year.

"The work that we are doing is really valuable to the industry," says Charette. "We never thought that we'd be running our (nuclear) units as long as we have. This project gives us the confidence to say Bruce Power can safely operate up to 300,000 equivalent full power hours. That would have been unheard of 10 years ago."

In speaking at the recent Pickering relicence hearing

to the Canadian Nuclear Safety Commission, Dermarkar noted, the FCLM program in conjunction with other COG fuel channel research, "represents the most significant evolution of CANDU technology in the past 30, or more, years."

FCLM has been equally exciting on a personal level, says Charette.

"I always tell people I love my job," she says. "Genuinely, I love my job. It's both technical and strategic. I call it a spotlight position because it is the place people turn to when want to understand how long they can run their plants."

During her one-year secondment at COG, Charette hopes she can improve the synergies between the FCLM and Fuel Channel R&D programs. She points out the industry has a strong, collaborative team that can take the ball further along to new innovations in this area.

"There are people who have spent their entire career in fuel channels so everybody knows everybody," says Kathy. "Everyone works well as a team. On calls, there is great collaboration to help solve problems. I've seen collaboration and teamwork with the entire community working on this program."

Collaborative project partners include both utilities and supplier participants. In addition to OPG and Bruce Power, the project team also includes companies like Canadian Nuclear Laboratories, Kinectrics and CANDU Energy. The vendor community brings valuable input and innovation to solve the problems faced by operators, says Charette.

COG's vision is excellence through collaboration and in the case of fuel channels; excellence means nothing less than life extensions that will take today's CANDU plants further than they have ever gone before.

Creating value for international members

Above, Carmen Trandafir, SNN Senior Advisor Teodor Chirica, Fred Dermarkar, SNN General Director & CEO Cosmin Ghita, Mike Brett, and Sonia Qureshi (left to right) at the SNN head office.

Above, the COG Team with SNN representatives at CITON (Centrul de Inginerie Technologica Obiective Nucleare – The Technical Engineering Centre for Nuclear Objectives).

COG visits SNN, Romania on expedition of learning and collaboration

In April, CANDU Owners Group's President and CEO Fred Dermarkar and several COG management team members visited Societatea Nationala Nuclearelectrica (SNN), Romania at the Cernavoda nuclear plant and at SNN's head office in Bucharest to meet with utility executives including SNN CEO Cosmin Ghita.

Amongst the topics discussed were opportunities for international collaborative research and development and COG's R&D streams, including the most significant work underway in safety and licensing, health safety and environment, chemistry, materials and compounds, industry standard toolset as well as fuel channels research and the joint projects on fuel channel life management. SNN is planning a mid-life refurbishment for its Cernavoda plant to begin in 2026 and is also interested to learn from the refurbishments of other CANDU stations. Asset management, balance of plant and obsolescence management are also areas of interest for the utility.

Centre photo, a puzzle display in the SNN lobby in Bucharest celebrates their 20th anniversary.