

# 2020 A year like no other

DEC. 17, 2020 — In 2020, CANDU Owners Group (COG) and its members leaned into COG's motto of excellence through collaboration in the face of the global COVID-19 pandemic. And they delivered.

COG members maintained strong performance – in some cases achieving record runs of days online. They generated electricity without disruption to communities worldwide while instituting COVID-19 measures in their plants and advancing significant refurbishment and new technology projects (see pullout for more details), well supported by their supplier community partners.

As we head into 2021, with the promise of post-pandemic life on the horizon, we look back on highlights of this year's successes. Our collective accomplishments are a reminder, we're all in this together.

## COVID-19: The CANDU Industry #PowersOn

### COG's Operations and Maintenance Pandemic Planning Group

Through COG, the Canadian and international member utilities created an Operations and Maintenance Pandemic Planning Group (O&M) that included Canadian Nuclear Laboratories (CNL). Through COG WebEx, the participants exchanged information in real time to assist with immediate and emergent technical issues arising from the pandemic. Together, they developed a proactive response that anticipated required next steps. As one plant learned a lesson through implementation, every CANDU plant benefited from the learnings.

### Rapid Response Communications

Even prior to the activation of the Ops and Maintenance Group, in the lead up to the pandemic, a COG communications site was set up on COGonline that allowed COG's member and organizational partners to share up-to-the-minute information, to consider policies and language being used by other COG utilities. This took place as the communication teams worked to keep information flowing across the industry and through their companies on the latest status of the virus and related government policies on travel and work.

### Fully remote, full-on collaboration

When the pandemic struck, COG quickly transitioned to its existing virtual tools as a safe alternative to face-to-face meetings and training. The COG team used the company's well-established meeting systems and network to bring information to our members and help them connect with each other. Peer team meetings and workshops continued as did important research, joint projects, OPEX sharing and other team activities.

As well, with travel removed from the equation, some international members found it easier to participate in COG activities, something COG will reflect on to strengthen global collaboration even once the pandemic is over.

### Giving back to communities in need

Our members were an inspiration to us in 2020. The full story on COG and the CANDU industry's response to the COVID-19 pandemic can be found [here](#) and see our story about our members' 2020 achievements [here](#).

The COG team raised more than \$8,000 for food bank and mental health charities as part of its pandemic response. COG's charity committee launched employee campaigns in the spring and fall to support Toronto's Daily Bread Food Bank and the Canadian Mental Health Association.



COG staff have supported many organizations in the past (top, working with Habitat for Humanity in 2019). In 2020, they raised money for Toronto's Daily Bread Food Bank, bottom, and the Canadian Mental Health Association.

## New leadership



Clockwise from left: New COG President & CEO Stephanie Smith was profiled in the October 2020 issue of NEI Magazine. Carlos Lorencez takes over as director of COG's NSEA line of business, Sorin Gheberu of SNN, Romania joins the COG Board of Directors.

This was a year of change for COG's leadership. In September, Stephanie Smith assumed the role of president and CEO taking over from Fred Dermarkar. Smith, previously served as deputy SVP of OPG's Darlington Nuclear Station, a role she assumed in 2019 after a secondment at the World Association of Nuclear Operators and many years in leadership at Pickering Nuclear. She became the first female president and CEO in COG's history, following a 30-year trailblazing career at OPG.

Despite social distancing, Smith is quickly getting to know the COG community. She hosted a virtual Annual General Meeting of COG members at the end of September and has participated on and moderated several industry panels both on technical issues and a subject close to her heart: women in leadership. You can read more about her career as a woman in nuclear in this [Nuclear Engineering International Magazine](#) feature.

Dermarkar departed COG after six years at its helm. His achievements included advancing the COG collaboration model and strengthening the organization through enhanced program delivery, increased international engagement and a staffing plan that strengthened COG's diversity in expertise, gender, ethnicity and age.

In 2020, COG welcomed a well-respected industry leader in nuclear safety to serve as its director of Nuclear Safety and Environmental Affairs (NSEA), Carlos Lorencez, previously OPG's Director, Nuclear Safety, assumed the NSEA leadership role in October.

As well, in July, SNN, Romania re-joined the COG board with Sorin Gheberu bringing an international perspective and prior COG board experience.

## Collaboration for exponential results

### Innovating for stronger, longer plant performance

In March 2020, COG closed out its 2019-2020 fiscal year with a 10-year high in delivery of Research and Development (R&D) work. R&D worth \$42.3 million was delivered on behalf of COG member interests in six program areas. When combined with joint project work completed on behalf of participating members, COG delivered more than \$70 million worth of projects in its 2019-2020 fiscal year.

This work, year-over-year, has helped our members reach new records of achievement in plant safety, reliability, environmental performance and cost reductions. Some of this work has also resulted in longer plant life, creating billions of dollars in added revenue and offsetting potential greenhouse gas emissions, an excellent return on investment.

Where COG members have common interests in CANDU plant performance, working through COG, they can achieve exponential results for far less investment than they could, independently. This adds value for our member organizations, strengthens our industry's reputation and most importantly, benefits the people who rely on nuclear energy to power their lives. In the past year, for the first time, new projects initiated through the CANDU-6 Fleet focused on equipment reliability and increasing plant performance. As well, through COG, members benefited from bulk procurement opportunities and projects through COG's Supply Chain, Obsolescence and Procurement Program.

### Improved performance, reduced costs and outages

New technologies and related processes are revolutionizing some of the nuclear industry's core work.

Through COG's **Reduced Outage Program**, COG member utilities are collaborating with CNL, COG supplier participants, and the University Network of Excellence in Nuclear Engineering (UNENE) to develop and employ advanced technologies and methods to reduce maintenance effort during outages. This area of strategic R&D is reducing costs and returning plants online faster, resulting in greater earnings from increased generation and better overall performance.

Some of the latest technologies are being applied as part of the reduced outage effort including machine learning, robotics, digitalization, automation, online monitoring, new and improved sensors, probes and advanced analytics. Coupled with initiatives in human performance and process improvements such as the on-going development of condition-based maintenance, CANDU stations are seeing stronger performance results with less time offline.

Another area of COG research has developed a **hydrogen effusion probe**, known as a HEP, for online corrosion measurement in the Primary Heat Transport (PHT) system. The tool helped Darlington's Unit 2 return to service faster by reducing the time required for corrosion measurement by approximately 30 per cent.

As well, a joint project involving COG, NB Power and OPG led to the creation and deployment of a new **fueling machine ram seal** that improved performance life and endurance of an underperforming component at the Point Lepreau and Pickering plants.

### Continued performance on fuel channel life management and research

Over the past decade, COG members have gained tremendous benefit from advancements in the Fuel Channels program. The **Fuel Channel Life Management Project** supports life extension commitments, including at Pickering Nuclear, worth billions of dollars in extra generation. As well, the project has supported viability of the OPG-Bruce Power refurbishment synchronization by demonstrating the capability for units at Darlington and Bruce Power to operate longer, delaying the need to take units offline. In addition, COG has provided continued support of **pressure tube surveillance** for OPG, Bruce Power and for the first time overseas at Wolsong (KHNP). Through collaboration and cost sharing, the utilities gain access to more data for the fitness-for-service predictability with less cost and increased validation points to use in their modelling.



Top, a CNL employee analyzes a sample of a bursted pressure tube as part of fuel channel research work for COG. Bottom, a hydrogen effusion probe. Photos courtesy of CNL and OPG.

Ontario Power Generation (OPG) opened its Centre for Canadian Nuclear Sustainability (CCNS) in Pickering, this fall. COG is a community partner with CCNS, a coordinating centre for supply chain decommissioning activities. Image courtesy of OPG.

## Innovation in CANDU decommissioning

In 2020, CANDU utility decommissioning leadership and projects continued to advance with support from COG.

Work continued on the joint project for the development of a national Integrated Waste Strategy (IWS) for low and intermediate level waste disposal to fulfill the current action on Canada from the IAEA Joint Convention on the Safety of Spent Fuel Management and Radioactive Waste Management through the COG Radioactive Waste Leadership Forum.

COG's decommissioning joint projects achieved notable milestones in the areas of calandria segmentation, fuel encapsulation and the development of a KHNP decommissioning schedule. Each of these projects progressed plans and activities specific to their participants but lessons learned and associated OPEX will benefit the entire industry. This is an area of increasing interest and activity for COG members in Canada and internationally, with more research, joint projects and policy collaboration expected in 2021 and beyond.

## COG's commitment to diversity, equity and inclusion

In July, COG signed on to the international industry's "Equal by 30" commitment, led by the Clean Energy Ministerial and the International Energy Agency.

COG has achieved the campaign goal of gender parity, a decade early, with about half of its workforce comprised of women, at all levels of the organization.

Participation in initiatives like Equal by 30 and in organizations like Women in Nuclear is one aspect of COG's commitment to a broader diversity, equity and inclusion philosophy. In fact, the diversity of COG's workforce strengthens our members' ability to gain the most from a global collaboration model.



Members of the COG team at the WIN Canada Annual Conference in 2019.

## Partnerships toward a stronger nuclear industry



Representatives from COG, NEA, NRCAN and AECL participated in a virtual signing ceremony, Sept. 30, to mark a new collaboration agreement between COG and NEA.

At a virtual signing ceremony in September, COG and the Nuclear Energy Agency (NEA), a specialized group focusing on nuclear within the Organisation for Economic Co-operation and Development (OECD), signed an agreement to partner on areas of shared interest. The COG-NEA MOU allows each organization to increase collaboration to the benefit of their respective members.

As well, in November, COG became a community partner of the recently launched Centre for Canadian Nuclear Sustainability (CCNS). COG will collaborate with the OPG-led innovation hub created to drive innovation in decommissioning and to further economic growth from Canada's nuclear industry activities to the benefit of Indigenous and other communities.

COG partners with several industry organizations in Canada and internationally. And, through COG peer groups and forums throughout all areas of utility management, COG members partner every day in hundreds of industry-improvement initiatives. Through COG's auditing services programs – CANPAC and CANIAC – members and leaders' suppliers benefit from joint quality assurance and audit services, saving time and money through this collaborative approach.

## Advancing SMR development

Through COG, members, SMR vendors and partner organizations are sharing information, pooling resources and working together to develop and deploy SMRs as they build a vibrant SMR industry.

In 2020, COG worked with the Canadian Nuclear Association on the Canadian Nuclear Industry SMR Secretariat to track progress against the **pan-Canadian SMR Roadmap**. COG plays a key role within the Secretariat, which engages the various parties working toward SMR development, and tracks and documents progress on the SMR Roadmap recommendations.

The Government of Canada, together with partners across the country, is expected to launch its SMR Action Plan before year end. COG has a chapter in the Action Plan outlining its role and commitment to achieve Canada's vision for the use of SMRs to meet the country's greenhouse gas emission reduction goals, deliver jobs and move toward a low-carbon future.

COG-led joint projects included an SMR market study and a white paper on principles and best practices for utilities pursuing SMR development. As well, COG works with global partner organizations on SMR requirements harmonization. A second white paper, co-authored by COG and the World Nuclear Association looks at **regulatory harmonization between Canada, the UK and the US**; something considered instrumental by SMR developers to progress the industry, worldwide.



COG is working with industry organizations, SMR vendors and government to share information and pool resources in support of SMR development in Canada and around the world.

## Achieving supplier excellence



COG's Front-Line Supervisor Leadership Training Program for Supplier Participants offers first-line supervisors training focused on strong safety culture and human performance.

In November, a joint COG-SNC Lavalin Supplier Culture of Excellence (SCOE) pilot training course was launched to help supplier participant organizations better understand the fundamentals of human performance (HU). The course will help suppliers improve workplace performance and safety as well as assist human error through prevention and mitigation activities.

Through COG's Supplier Participation Program (SPP), about 30 leading industry suppliers have collaboratively developed an internationally-recognized approach to improving safety and quality culture as well as metrics to track their progress.

COG's supplier program provides opportunities for information exchange, training and interaction between operators and suppliers. Together, the suppliers:

- Share supplier perspectives, operating experience (OPEX) and lessons learned;
- Identify, communicate and resolve common challenges in execution of services for customers;
- Gain insights on top issues suppliers should address and develop common approaches to do so;
- Engage with customers and remove impediments for the benefit of the nuclear industry; and
- Strengthen and secure the CANDU supply chain through counterfeet part prevention.

Through the SPP, supplier participants have developed training, OPEX and information exchange mechanisms similar to development programs used by nuclear operators for decades.

## Strengthening COG's business to support our members

COG's Corporate Services area continued to focus on strengthened procurement processes with the goal of getting the best value for our members. Annually, COG procures about \$70 million in products and services on behalf of its members. In 2020, COG expanded its procurement team, revised policies and continued its practices of working closely with vendors to ensure maximum value for member dollars.

As well, a multi-year initiative focused on improving COG's data management and OPEX search functionality, through its members-only COGonline platform, made progress. The goal of the initiative is to use AI and machine learning technologies, and to enrich data with automatic tagging, to enable COG members to find information more efficiently and easily.



COG's OPEX database contains more than 45,000 entries which members can securely access at any time through the member-only COGonline platform.

## Looking forward to 2021

As we get close to the end of 2020, perhaps the thing in which we can all take pride is simply the fact we survived and even thrived in a year like no other. We made it through by working together, even while physically apart. The lessons learned will serve us well to achieve excellence through collaboration no matter what 2021 has in store.

Want to read more? Learn about some of the top 2020 achievements of COG members [here](#).

Stay tuned in January 2021 for the next edition of COGnizant Magazine which will highlight more success stories focusing on COG, member and partner-driven innovation. Our 2020 issues of COGnizant can be found [here](#).



Staff follow COVID protocols while working in the control room of CNNO, China's Third Qinshan Plant. Image courtesy of CNNO.