POWER NEWS

SUMMER 2018

Connecting the people who power Ontario

YELLOW SUBMARINE
Divers use mini sub to solve tricky problem at Smoky Falls GS
page 5

HAPPY ANNIVERSARY
Abitibi Canyon GS celebrates 85 years of generating clean power
pages 6 & 7

SUCCESSFUL HARVEST
Just what goes into harvesting Cobalt-60 at Pickering Nuclear?
page 8

IN THIS ISSUE

On The Cover: Cobalt-60 isotopes are harvested at Pickering Nuclear GS

Mailing Address :
Ontario Power Generation
700 University Avenue, H19
Toronto, ON M5G 1X6

Email :
powernews@opg.com

Website :
www.opg.com

THE DARLINGTON REFURBISHMENT IS DRIVING NEW JOB CREATION

DARLINGTON REFURB HELPING TO FILL GAP IN SKILLED TRADES

OPG has been driving multiple initiatives that offer career-building opportunities in the nuclear industry to help support the Darlington Refurbishment project and fill the widening gap in skilled trades capacity.

"We anticipate by 2023, the demand for skilled trades will be at its peak," said Dietmar Reiner, Senior Vice President of Nuclear Projects. "OPG has been working with our partners to help ensure we have access to a steady stream of highly skilled workers to support the Darlington Refurbishment and other nuclear projects in the province."

Working with the Electrical Power Systems Construction Association, OPG has identified a list of trades — including boilermakers, millwrights, pipefitters, electricians and carpenters — whose demand within the sector is likely to exceed supply within the next five to 10 years.

OPG's newly introduced Indigenous Opportunities in Nuclear (ION) program is one of the initiatives aimed at filling the gap in skilled trades. Working with Kagita Mikam Aboriginal Training and Employment, ION seeks to recruit qualified workers from Indigenous communities and set them on exciting projects, such as the Darlington Refurbishment, while providing them with transferable skills.

"The program's goal is to place ION recruits in career-building jobs at OPG, our vendor organizations or in union halls," said Kenn Ross, OPG Indigenous Relations Advisor.

By fulfilling its mandate, ION will help increase the number of nuclear jobs held by Indigenous peoples to 2.4 per cent, up from 1.4 per cent currently.

UNIT 2 REFURBISHMENT ON TRACK

OPG is now past the half-way mark on refurbishment of Darlington's Unit 2. Having completed reactor disassembly, the project team is now rebuilding the unit part by part, including calandria tubes, fuel channels and feeder tubes. The reassembly phase is set to be completed by summer 2019.

LIANNE LEES

OUR PEOPLE: LIANNE LEES

Speaking at OPG's Women's Leadership Forum, Lianne Lees recalled being moved by a Grade 11 science lecture on catalysts. Years later, the lesson on the acceleration of a chemical reaction serves as a fitting analogy for the impact others have had on her career.

"I liked the look of the graph – a nice rise, smooth plateau, and then the catalyst moves on, having left the substance different than it was before," explained Lees, Civil Maintenance Section Manager of OPG's Darlington Nuclear Generating Station (GS). "Later, I realized that many of the people in my life have had the same effect on me. Without their influence, I am not sure where I would be."

After almost 14 years at OPG, Lees can relate very well to the concept of repeated change and advancement. After a career in Occupational Health and Safety at Eaton's and LCBO, Lees joined Pickering Nuclear GS in 2005 as a Conventional Safety Officer before shifting gears to a role as Front Line Manager in Civil Maintenance in 2007.

After nine years at Pickering, Lees made the difficult decision to change course and accept a new challenge as a Chemistry Front Line Manager (FLM) at Darlington. As Chemistry FLM for the Production Support Crew, Lees and her team monitored the station's water and air emissions to ensure employee and public safety.

Change came once again last August when she moved back to Civil Maintenance, this time as Section Manager at Darlington. She now leads up to 200 workers, including scaffolders, building mechanics, and painters, who support the station's outage and online maintenance work and keep the protected area looking its best. "We're promoting pride in plant and trying to reduce waste and improve maintenance efficiency," Lees said.

Lees may be coming into her own now, but her whole career has been spent overcoming her own self-doubt in the face of change. Before joining OPG, the mother of two teens and a five-year-old wanted to stay at home to care for her kids. But with the support of her husband, Lees pushed through her reluctance and applied for her first job with OPG. "I've learned to not listen to negative speak," she said.

EMPLOYEE SPOTLIGHT
LIANNE LEES

POSITION: Section Manager, Civil Maintenance

WORK LOCATION:
Darlington Nuclear Generating Station

YEARS OF SERVICE: 13

FAVOURITE PLACE TO VISIT IN ONTARIO:
Family cottage in Westport

FAVOURITE HOBBIES: Boating, canoeing, kayaking, swimming, skiing

FAVOURITE WEEKEND ACTIVITY:
Enjoying time with family

FAVOURITE MOVIE:
Anything by Wes Anderson

MINI YELLOW SUBMARINE HELPS SOLVE A TRICKY PROBLEM AT SMOKY FALLS GS

Che Swearengen and Trevor McKenzie aren't used to staying dry on the job.

As divers with OPG's Inspection and Reactor Innovation team, their duties normally include underwater work that involves maintenance and zebra mussel removal at OPG's nuclear stations.

However, recently the divers were in Northern Ontario to assist OPG's Northeast Plant Group with a different, but equally important, mission: checking for walleye spawning activity at the new Smoky Falls Generating Station, located about 70 kilometres north of Kapuskasing.

With the replacement of the three-unit hydroelectric station in 2014, man-made spawning beds were built downstream of the station on the Mattagami River to support the area's walleye population.

Because one shoal of walleye in particular is located in dangerous waters, there was no way to ensure that the spawning bed was being used as a fish habitat – until the dive team paid a visit with their remotely operated vehicle.

"We were trying to come up with all of these ideas about how to check and monitor these areas," said Wendy Cudmore, a Site Environmental Advisor with OPG's Northeast Operations. "We were at a loss, until we found out about our divers."

Using a remotely operated miniature yellow submarine, the team explored the bottom of the river in search of walleye.

While navigating fluctuating flows, the sub spotted a few crayfish and a lot of rocks until a walleye finally appeared on the monitoring screen. This was followed by more walleye over the next few hours.

The discovery was a good sign that the fish habitat and spawning bed are working to support this local population of the freshwater species, which are native to Ontario. The elongated walleye fish can grow to an average of 23 inches in length and weigh an average of three to five pounds.

OPG DIVER TREVOR MCKENZIE HOLDS A REMOTELY OPERATED SUBMARINE

A VIEW OF THE GORGE AT ABITIBI CANYON GS

ABITIBI CANYON GS CELEBRATES 85 YEARS OF CLEAN POWER

In the wilderness of northern Ontario, about 77 kilometres north of Smooth Rock Falls, a marvel of engineering continues to produce clean, renewable hydro power for the province 85 years after it first went into service.

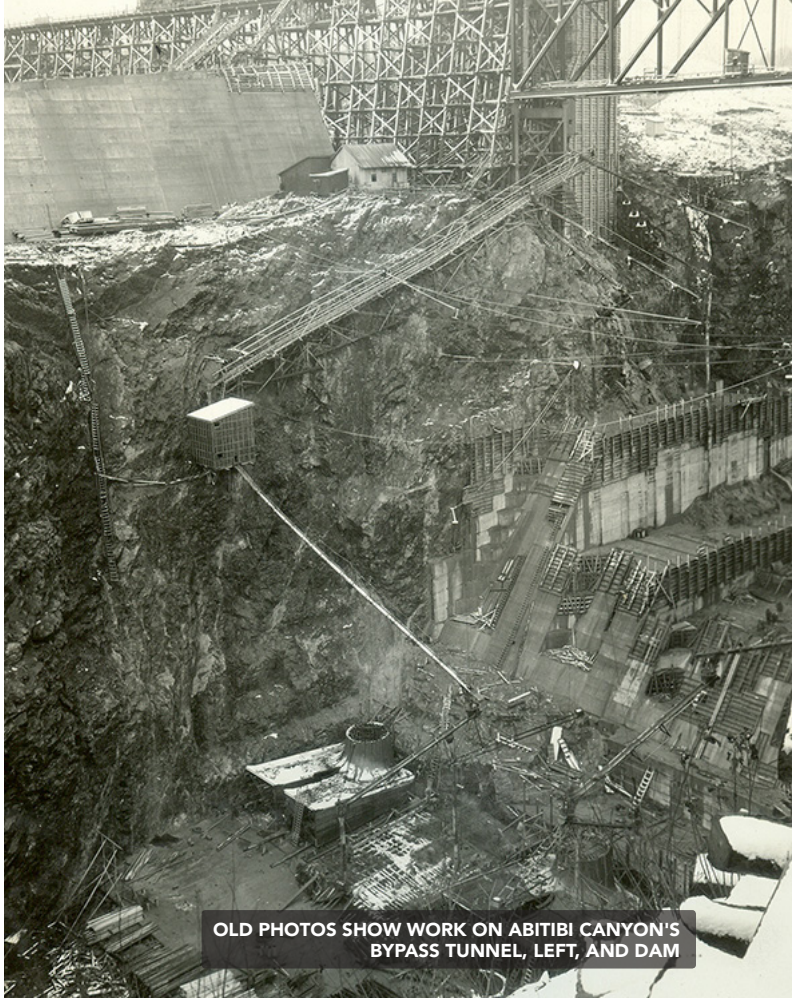
Built within a picturesque gorge on the Abitibi River, the Abitibi Canyon Generating Station began harnessing the raging river's power to produce electricity for northern mines and pulp and paper mills in May 1933, three years after construction began. Originally, two generating units were included, with another two added three years later, and the final unit installed in 1959. The five-unit plant is now capable of producing 349 megawatts of clean electricity.

Even by modern standards, the construction of the 45-metre-tall dam – one of the highest in Ontario – and its adjoining powerhouse is still considered an impressive feat, said Jamey Deforge, Acting Vice-President of OPG's Northeast Operations.

"It's amazing what they were able to do in a remote area in the '30s, with the technology they had, and to build it in just three years," said Deforge. "It's still in great shape today and I believe it could last another 100 years."

Work on Abitibi Canyon GS was headed by the Ontario Power Service Corporation. In July 1932, the project was halted and the corporation was soon placed into receivership. OPG's predecessor, Ontario Hydro, eventually took over the development early in 1933 and finished construction later that year.

Approximately 2,000 labourers and engineers worked on the station's construction, which included excavating two bypass tunnels through the canyon walls that diverted the Abitibi River while the dam was being built. A 137-metre-long



OLD PHOTOS SHOW WORK ON ABITIBI CANYON'S BYPASS TUNNEL, LEFT, AND DAM

steel railway bridge spanning the gorge was also built solely to transport in equipment and materials like concrete.

To accommodate the workers and their families in the isolated area, the Abitibi Canyon colony was established in 1930. This unique hydro community contained multiple homes as well as a staff house, school, skating rink, general store, hospital, post office and church.

Up until a highway was built connecting the colony to Smooth Rock Falls in 1966, the only way to get to the isolated settlement was either by floatplane, which landed in the station's reservoir, or by rail to the nearby Fraserdale station.

By the early 1980s, when the province decided to close the community, about 300 people called the settlement home.

Today, OPG still operates a staff house near the station that provides temporary lodging and meals for employees working at the plant. All maintenance and services for the station are now performed by trade staff from OPG's Timmins Service Centre, with most employees driving in from Timmins, Smooth Rock Falls, Cochrane, or Kapuskasing.

"Working at Abitibi Canyon has been a bit of a rite of passage for many hydroelectric staff at OPG, especially among the older generation," Deforge said.

Over the next few years, the stalwart hydro plant, which undergoes a major unit overhaul every 25 years, has a few big projects coming up. These include replacing several aging transformers, the demolition of the old staff house, upgrading the elevators that operate on the canyon wall, and rewinding the stators on three units.

This important work and ongoing repair and maintenance of all concrete structures continue to keep the 85-year-old Abitibi station operating – and looking – as good as ever.

"Most people that come up here say that this is probably the best station we have in OPG's fleet," Deforge said. "It has a lot of character, with a gorgeous view of the canyon and 300 feet of head waters. It's a beautiful station with a proud history."

COBALT-60 IS HARVESTED AT PICKERING NUCLEAR GS

IMPORTANT COBALT-60 ISOTOPES SAFELY HARVESTED AT PICKERING NUCLEAR

Earlier this year, life-saving Cobalt-60 was safely harvested at Pickering Nuclear Generating Station, a process that first took place at the plant in 1971.

Harvesting of this important radioisotope began in January at Pickering's Unit 6 during a planned maintenance outage. In March, the mature Cobalt-60 was packaged and shipped out to Ottawa-based Nordion, a provider of medical isotopes and gamma technologies.

Once processed, the radioactive isotopes will be sent across the globe to sterilize 40 per cent of the world's single-use medical devices, such as syringes, gloves, implants and other instruments, as well as food products.

"The harvesting of Cobalt-60 at Pickering Nuclear continues to help countless patients and keep our hospitals safe," said Jeff Lyash, OPG's President and CEO. "This technology is just another example of the societal benefits of clean nuclear power."

The whole process begins with the mining of Cobalt. The element is removed from the ground and processed into pure Cobalt-59 powder, then compressed into slugs. These slugs are assembled into adjuster rods, which are then shipped to Pickering Nuclear where they are inserted into a reactor core. Over the course of 18 to 24 months, the rods absorb neutrons and the Cobalt-59 changes at the atomic level to become Cobalt-60.

During a planned maintenance outage of the unit, the newly formed Cobalt-60 rods are removed and stored in water in the station's spent fuel bay. Mechanical technicians from the Pickering projects group then extract the irradiated rods one at a time and safely place them in a shielded container to be shipped to Nordion, where the Cobalt-60 is processed and distributed. Meanwhile, new Cobalt-59 rods are inserted into the same unit, where they will wait another roughly two years before they're pulled in the next outage.

The characteristic blue glow of the water around Cobalt-60 is a result of the electromagnetic gamma radiation travelling faster than light can through the water – a phenomenon known as Cherenkov radiation.

Ontario's nuclear reactors produce more than 50 per cent of the world's supply of Cobalt-60. The sterilization of single-use medical supplies using this radioisotope affects about 100 million people per year.

LOCAL INDIGENOUS HISTORY, CULTURE CELEBRATED AT DARLINGTON

At Darlington Nuclear Generating Station, a new First Nations display along with three Ojibway totems proudly celebrate local Indigenous culture and the environment.

OPG collaborated with members of the four Mississauga communities of the Williams Treaties First Nations – Scugog Island, Alderville, Hiawatha and Curve Lake – to produce the unique display and sculptures.

Unveiled in June, the new exhibit at the Darlington Nuclear Information Centre celebrates the history, culture and traditions of the Mississauga people. Darlington Nuclear is located in the traditional territory of what is known collectively as the Mississauga Anishnawbeg.

"When we first built the visitor centre, I had always envisioned that we would have something like this that honours the traditional Indigenous communities in this area," said Brian Duncan, Senior Vice-President of Darlington Nuclear. "This display is all about informing the community and our employees and tying this area to the rich history that has come before us."

Several traditional artifacts were donated by members of the First Nations for the display, including an example of porcupine quillwork, a pair of ricing sticks, and a black ash basket.

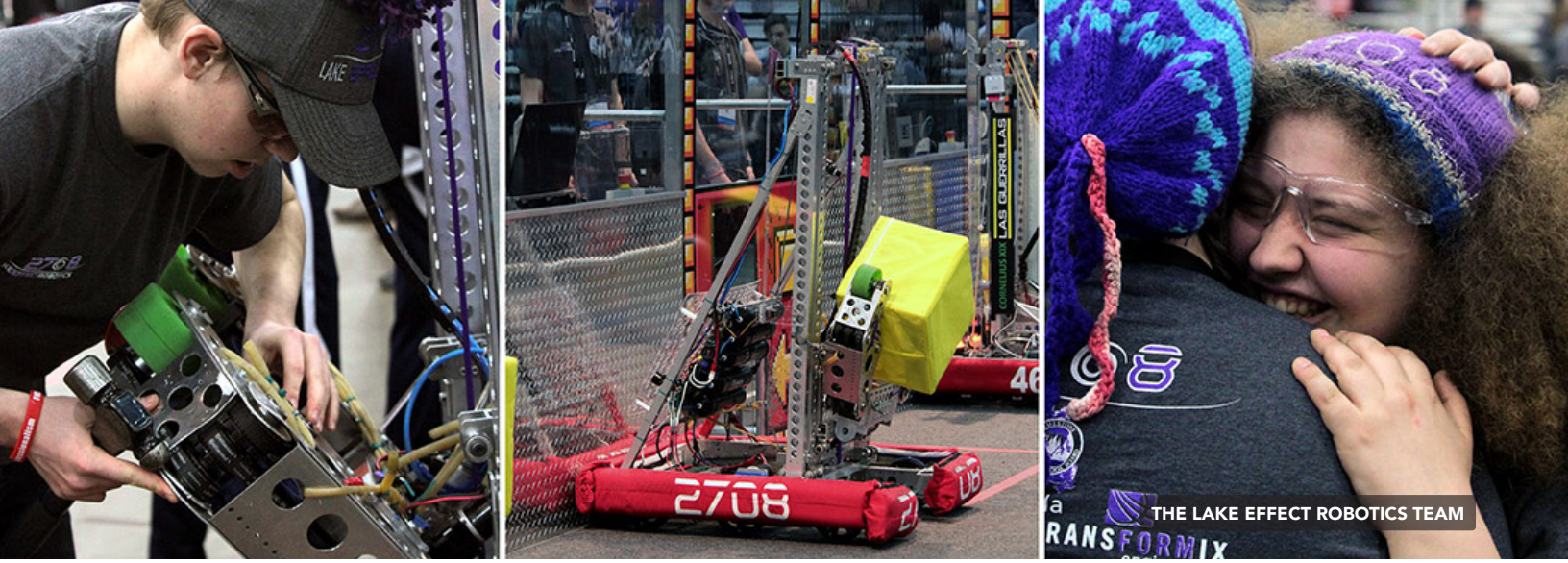
"Porcupine quillwork is a lost art," said Kim Muskrat, a member of the Hiawatha First Nation who donated the piece. "We used this before beads were introduced to us to decorate our regalia and outfits."

Meanwhile, at the nearby Coutt's Pond, three wood sculptures crafted by local Hiawatha artist Jody Paudash are now up for public viewing.

Paudash spent nearly four months carving and painting the nearly eight-feet-tall sculptures out of western red cedar. Each sculpture features two local animals – heron and beaver, osprey and fish, and owl and turtle.

"Each of these animal totems tells its own story of the sacredness of our traditional lands," said Paudash, who produced the sculptures from an Ojibway worldview. "These totems are a unique vision and interpretation of my culture."

NEW INDIGENOUS SCULPTURE AND DISPLAY AT DARLINGTON



OPG-SPONSORED ROBOTICS TEAM WINS WORLD CHAMPIONSHIP

They came to Detroit with a 150-pound, five-foot-tall robot and conquered the world.

The OPG-sponsored Lake Effect Robotics team, comprised of 30 students from the Limestone District School Board in the Kingston area, were part of a four-team alliance that won the FIRST (For Inspiration and Recognition of Science and Technology) Robotics World Championship in Detroit in April, beating more than 3,500 teams from 27 countries.

"It was an amazing feeling. We were so, so excited when we won," said Kevin Wood, a Computer Science teacher at Kingston Collegiate & Vocational Institute who led the board-wide team to their first ever championship. For the past 10 years, Wood has been involved with the event run by FIRST, which works with youth to build future innovators in science, engineering and technology. OPG was a founding supporter of FIRST Robotics Canada in 2002.

It was a whirlwind season for the team comprised of Grade 7 to 12 students from six different schools. Beginning in January, the youth met after school to brainstorm, design, and build a remotely-operated robot that would be able to perform in this year's arcade-themed game, which saw teams score points by moving and stacking boxes on a balancing scale.

After competing in the Ontario championships and finishing 11th in the province, the team qualified for the world championships in Detroit where 409 teams faced off. In Detroit, Lake Effect Robotics, also known as Team #2708, won their division and were selected to be part of a four-team alliance comprising of teams from Michigan and Pennsylvania.

Competing in front of more than 40,000 people at Ford Field, the alliance won two straight 3 vs. 3 matches in the final to claim victory. Only three other Canadian teams, one of which was also OPG supported, have ever won the world title. The key to success was the aluminum-clad machine's robust design and full team effort, Wood said.

"There are a lot of roles on this team, aside from designing and building. Some students prepared award presentations, others helped with videos and photos, and scouted other teams," Wood said. "Everybody worked hard to achieve this goal."

More than that, each student learned teamwork, leadership, and gained valuable experience for their future studies, Wood said.

As part of its Corporate Citizenship Program, OPG provides funding to high school robotics teams in its host communities. The company has supported the Lake Effect Robotics team for several years, helping to cover costs like registration fees.

"As one of our larger sponsors, OPG's support continues to build and nurture our future scientists and engineers," Wood said.

For more information on FIRST, visit www.firstroboticscanada.org.

OPG STARTS THE YEAR OFF STRONG WITH SOLID Q1 RESULTS

OPG had a strong start to its fiscal year, reporting solid financial results and operational performance for the first quarter of 2018.

The company's net income attributable to the Shareholder for the first quarter was $535 million compared to $64 million for the same period in 2017. The major increase was attributed in part to strong nuclear generation performance and the one-time gain on the sale of OPG's former Lakeview Generating Station (GS) lands in March. In the same month as the Lakeview sale, a special dividend of $283 million from last year's sale of OPG's head office premises was also transferred to the Province.

The overall increase in net income was also attributable to the impact of new regulated prices for OPG's nuclear and most of its hydro generation. In December 2017, the Ontario Energy Board (OEB) issued its decision on OPG's application for new regulated prices for the 2017-2021 period. In March 2018, the OEB issued the final payment amounts order on the application, allowing OPG to begin collecting revenues based on the new regulated prices.

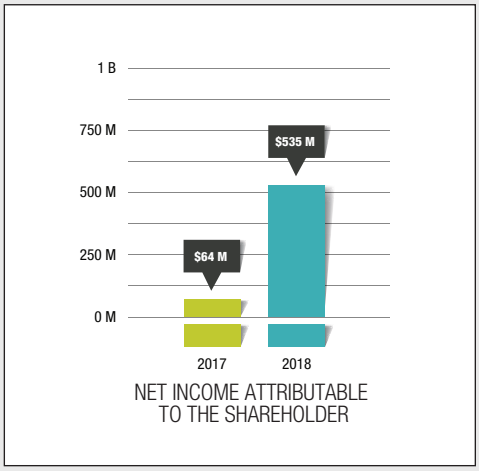
"We are pleased to report our strong first quarter has resulted in significant net income to our shareholder," said Jeff Lyash, OPG's President and CEO. "We remain focused on our operational performance and the Darlington Refurbishment project, which remains on time and on budget due to the hard work and dedication of our employees and partners."

Operationally, the company's generation levels increased to 18.8 terawatt hours (TWh) from 18.6 TWh for the same quarter in 2017. Higher nuclear generation of 0.4 TWh during the first three months of the year was primarily due to fewer planned outage days at Darlington Nuclear GS. In addition, Darlington's unit capability factor for the operating units was 96.5 per cent, compared to 85.3 per cent for the same quarter in 2017.

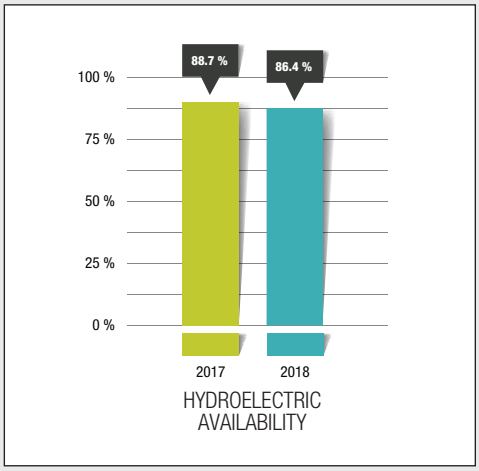
At Pickering Nuclear GS, the unit capability factor decreased to 74.5 per cent for 2018, due to a higher number of planned outage days in the cyclical maintenance schedule at the station in the first quarter of 2018. OPG's regulated hydro stations also saw a slight decline in generation as a result of lower water flows on the northwestern and eastern Ontario river systems.

On the projects front, OPG made significant progress: the Darlington Refurbishment project has now transitioned to the third major segment – the installation and reassembly of reactor components; construction continues on the 10 MW single-unit powerhouse at the Ranney Falls GS site; and site preparation for the new Nanticoke Solar facility commenced in the first quarter.

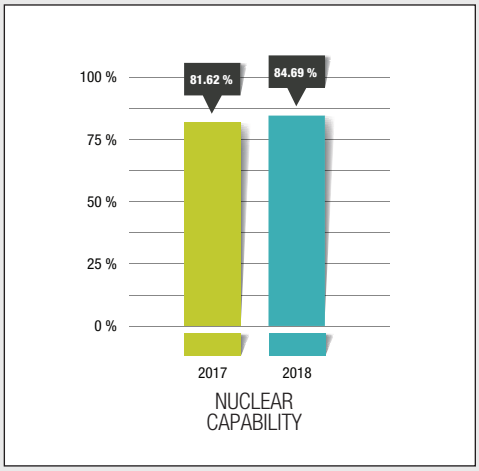
YEAR-TO-DATE MARCH 31 RESULTS



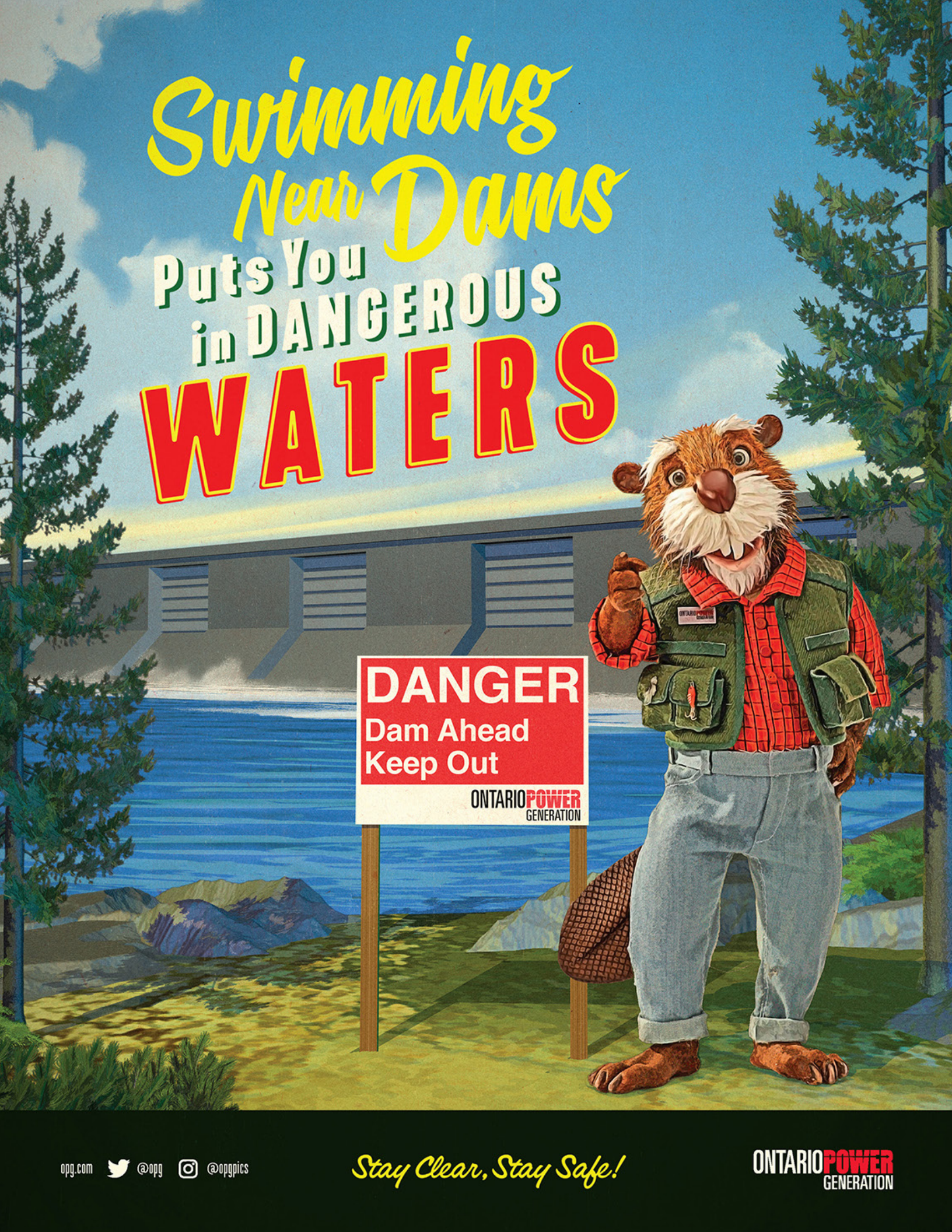
NET INCOME ATTRIBUTABLE TO THE SHAREHOLDER



HYDROELECTRIC AVAILABILITY



NUCLEAR CAPABILITY


Swimming Near Dams
Puts You in DANGEROUS WATERS
DANGER
Dam Ahead
Keep Out
ONTARIO POWER GENERATION
opg.com @opg @opgpics
Stay Clear, Stay Safe!
ONTARIO POWER GENERATION