

Connecting the people who power Ontario



DARLINGTON REFURBISHMENT

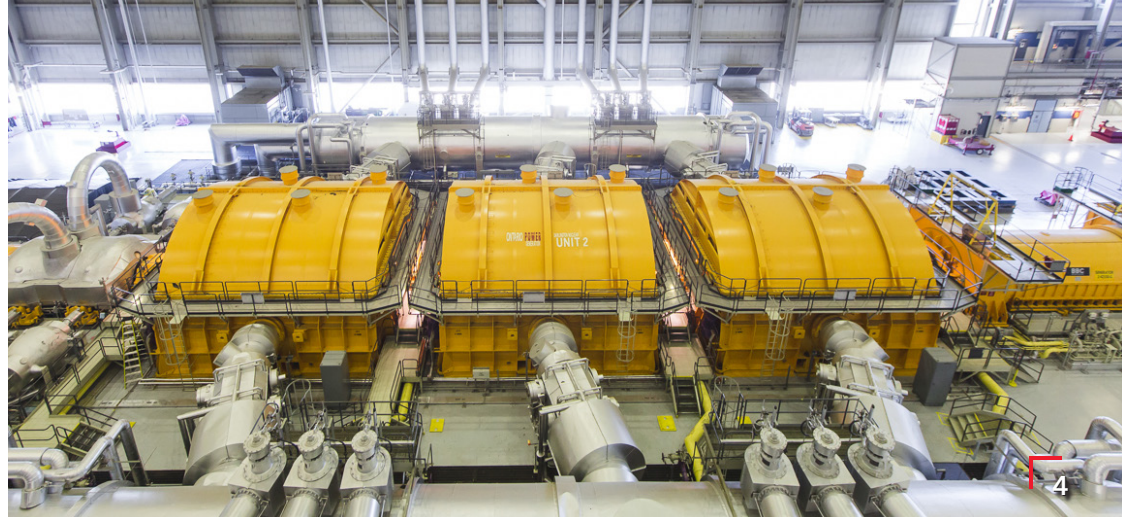
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Mailing Address :

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

Email :

powernews@opg.com

Website :

www.opg.com

PROGRESS CONTINUES ON NORTHEAST HYDRO PARTNERSHIP



PETER SUTHERLAND SR. GENERATING STATION

Project crews continue to make solid progress on the Peter Sutherland Sr. Generating Station – a new 28 megawatt hydroelectric facility located about 90 km north of the town of Smooth Rock Falls.

The generation development partnership between OPG and Coral Rapids Power – a company wholly owned by Taykwa Tagamou Nation – will use a portion of the water flowing down New Post Creek to generate electricity by transporting water 250 m from the intake via a penstock to the station on the Abitibi River.

Named after a respected community elder, the Peter Sutherland Sr. Generating Station will provide enough renewable electricity to power up to 28,000 homes.

To date, crews have focused on concrete pouring, stripping and formwork associated with installing the penstock and building the powerhouse.

Through the summer, this clean power project has employed more than 300 individuals onsite. This

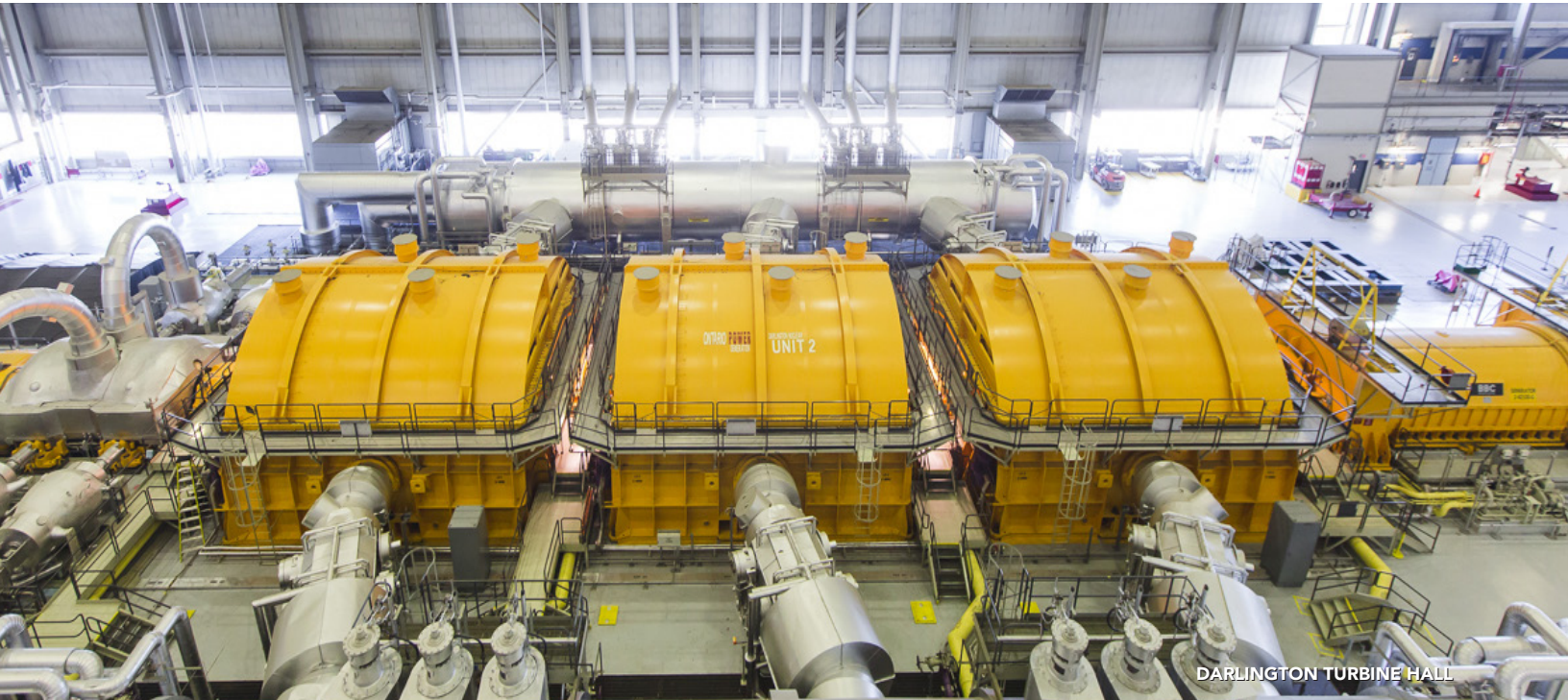
employment has been distributed across a wide variety of professions and trades typically associated with a remote heavy construction project.

Currently 65 per cent complete, the Peter Sutherland Sr. Generating Station is expected to be in-service in 2018.

DID YOU KNOW?

- Approximately 60 per cent of the workers are from northern Ontario.
- A camp was built to house more than 200 workers at the site.
- A total 9,976 cubic metres of concrete has been poured to-date (about 94 per cent complete) enough to pave a sidewalk for 24 km.

REFURBISHMENT EXECUTION SET TO BEGIN



DARLINGTON TURBINE HALL

The Darlington Nuclear Generating Station has been safely and reliably producing almost 20 per cent of the province's electricity since the early 1990's. After six years of detailed planning and preparations, OPG is now ready to refurbish the station's four nuclear reactors extending their lifetime for another 30 years of clean power.

On Oct. 15, OPG will take the Unit 2 nuclear reactor offline to execute the Darlington Refurbishment. This three-year (40 month) project will be the first of four such outages over the next 10 years. During this period, OPG will remove, replace and repair critical components in each reactor.

To learn more about the Darlington Refurbishment project visit: www.opg.com/darlingtonrefurb.

PROJECT READINESS AT A GLANCE

The **\$12.8 billion** Darlington Refurbishment is the largest clean energy project in Canada. It's expected to generate **\$14.9 billion** in economic benefits to Ontario, and will create **11,800 jobs** at its peak. Scheduled for completion by 2026, a refurbished Darlington will provide safe and reliable energy for the next 30 years.



SAFETY

2,372

DAYS WITHOUT A
LOST-TIME ACCIDENT



SCHEDULE

OVER

22,000

CUBIC METRES OF CONCRETE
DELIVERED TO DATE - ENOUGH
TO PAVE A SIDEWALK FOR **46 KM**



QUALITY

30,000

THE NUMBER OF HOURS
TRADES HAVE PRACTISED
USING TOOLS AT THE
MOCK-UP TRAINING FACILITY

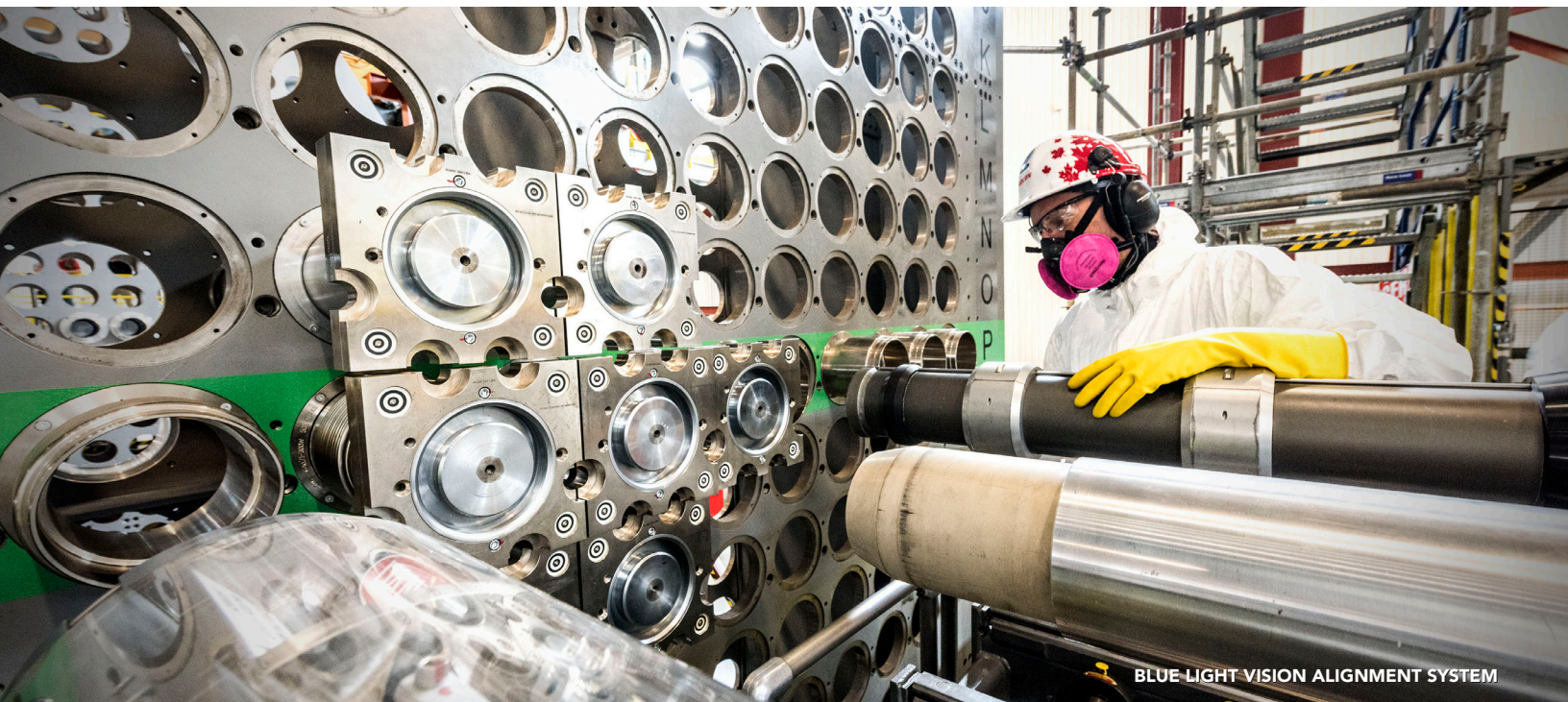


COST

\$2.6

BILLION
SPENT TO DATE

CAPTURING ACCURACY THROUGH A LENS: BLUE LIGHT INNOVATION



Have you ever taken a photo you didn't like? Nowadays, taking an eye-catching picture is as simple as picking up your smartphone. But for contractors working on OPG's \$12.8 billion Darlington Refurbishment project, taking an accurate photo is much more important than how compelling it is.

"People might think nuclear power generation and photography don't mix much," says Kevin Hill, Tooling Oversight Coordinator – Electrical and Controls at OPG. "But in actuality, we use cameras and imaging technology to help perform complex technical work in the reactor."

Staff will be using a Vision Alignment System, a precise tool that needs to robotically align with exact positions on the reactor face to execute discrete precision work. It's a tremendous task considering the reactor's 480 channels and hundreds of tube locations. However, the imaging hasn't always been foolproof.

"You could say it comes down to the photographer," says Hill. "In the past, we used a red light sensor system to target the sites, which was generally very reliable. However, we would occasionally get blurred

or inaccurate shots, and our only option was to keep reshooting until it gave us a useable image." ATS Automation, an OPG contractor based in Cambridge, Ontario, recommended a solution: the blue light visual alignment system. Inspired by the manufacturing industry, the software takes images with blue light, a less-prominent alternative to ambient light. As a result, the camera is able to produce sharper, more accurate images on the first try.

"It's like night and day," says Hill. "We aren't worrying about glare and reflection nearly as much, and as a result, we're saving a lot of time."

To further reduce the risk of error, the company installed a specialized camera to target only that colour in the spectrum. Although the switch from red to blue light may seem trivial, it will have a big impact on the refurbishment and to workers.

More than 60 companies from across Ontario are working with OPG to deliver Canada's largest clean energy project. Made-in-Ontario innovations like the blue light system will ensure quality performance and schedule adherence, two of the project's key pillars.



TALI SEROTA

OUR PEOPLE: TALI SEROTA

An Associate Coordinator of Dam and Public Safety, Tali Serota is sometimes called the “master of disaster”. Each year, she spearheads the creation of simulated emergencies at OPG’s hydroelectric facilities – an initiative aimed at testing employees and community first responders alike.

It’s definitely no small feat. The company maintains 536 emergency plans covering high consequence dams, and frequently updates and distributes them to 202 external agencies.

“OPG has an excellent reputation for our dam safety program, both in Canada and internationally,” says Serota. “It’s what makes my job so exciting. It’s rewarding to know that your work can make a difference to people’s lives, and that you’re contributing to OPG’s social license to operate in our host communities.”

Serota’s simulations help support these preparations, and contribute to the company’s exceptional safety record. “We take great pride in our ability to develop realistic scenarios that engage our communities as partners,” says Serota. “This ensures our emergency plans are seamlessly coordinated.”

To prepare the scenarios, Serota dedicates time to studying disasters from around the world. “I look at the lessons learned and the type of disaster, and I use the information to enhance OPG’s programming,” she says.

Her passion for disaster research goes far beyond OPG’s operations. Serota is a dedicated volunteer for the Canadian Red Cross disaster support services, as well as several professional associations.

“I have a degree in Disaster and Emergency Management, so I’ve always been interested in safety and security,” she says. “I’m currently working on a Disaster Science Fellowship, and I’m involved in a number of emergency management groups, including the Ontario and International Associations of Emergency Managers and the Canadian Dam Association.”

At the end of the day, Serota says she’s glad to be following her passions. “I love what I do,” she says.

EMPLOYEE SPOTLIGHT TALI SEROTA

POSITION: Associate Coordinator of Dam and Public Safety

WORK LOCATION: Toronto

YEARS OF SERVICE: 5 years

FAVOURITE SPOT TO VISIT IN ONTARIO:
Lake Simcoe in Innisfil

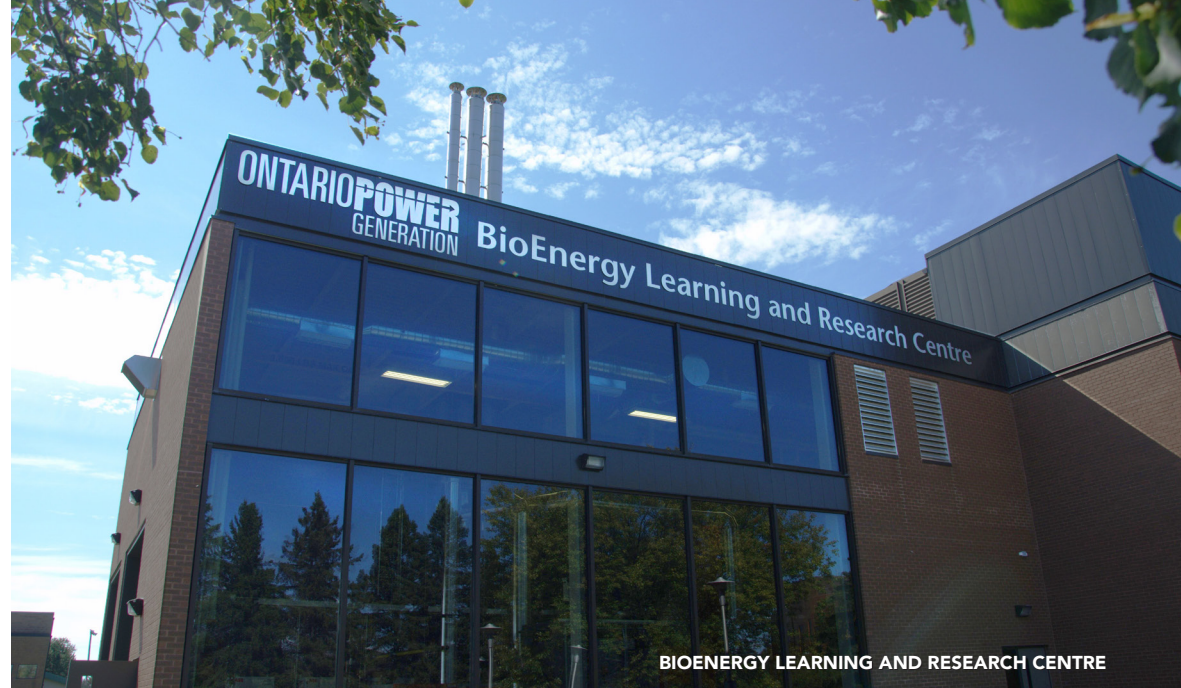
FAVOURITE BOOK OR LAST READ:
World War Z by Max Brooks

**IF YOU COULD HAVE ANY SUPERPOWER,
WHAT WOULD IT BE:** Invisibility

FAVOURITE WEEKEND ACTIVITY: Spending time at the cottage with my family and the dogs



STEPHANIE SEYMOUR



BIOENERGY LEARNING AND RESEARCH CENTRE

BUILDING BETTER BIOMASS TECHNOLOGY

Steam hisses above the humming of machinery, while graduate students look on excitedly. Hidden by thick metal, wood scraps are being burned, tested for their capability as a fuel source.

It's just another day at the OPG BioEnergy Learning and Research Centre, at Confederation College in Thunder Bay. In addition to providing renewable power to the college, the 4000 square-foot facility is a training-ground for engineers and forestry students at the college, providing a hands-on lesson in renewable biomass. Already, it's producing results.

"One of the Centre's best success stories comes out of a project with Environment Canada," says Brent Boyko, a production manager in OPG's Northwest Operations. "The facility is working with them to update wood waste regulations. Their research addresses the growing opportunities to implement biomass generation on a small scale."

The system at Confederation burns municipal tree cuttings and other wood waste to generate heat. It's greatly offset the college's natural gas usage, reducing carbon emissions and saving about \$200,000 each year.

"It's a world-class technology," says Boyko. "It's cleaner than natural gas on the life-cycle assessment, particularly in this case, where you're using wood that would have gone to landfill."

Though it only opened two years ago, the Centre has had a strong track record of inspiring innovation. Such was the case for Stephanie Seymour, a PhD candidate in Forestry and Natural Resources Management at Lakehead University.

A 2016 memorial student recipient of OPG's John Wesley Beaver Memorial Student Award, Seymour is studying renewable replacements for diesel generation in northern Indigenous communities. She worked with the Centre to conduct research for her master's degree, and credits it with kindling her interest in biomass.

"I knew that I wanted to work with Indigenous communities," she says, "and the renewable energy component of my research really developed while working with the Confederation College biomass facility."

OPG's Thunder Bay Generating Station is the first in the world to run on wood fibre based advanced biomass pellets. Its nearby Atikokan facility is the largest capacity plant in North America fueled exclusively by biomass.

"We're really proud to have this hub of biomass activity in our community," says Boyko. Biomass is a great, renewable opportunity, and it's helping to power a cleaner future."

EXPLORING CANADA'S FIRST URBAN NATIONAL PARK



Located 40 minutes east of Toronto's downtown core, the Rouge National Urban Park – Canada's first urban national park, is a pristine oasis rich with biodiversity and history.

It's even more spectacular this time of year when the canopy – which includes some of the last Carolinian forest in Ontario – begins to glow with red, yellow, and orange.

That's why OPG is partnering with Parks Canada for this year's fall walks series. The week-long October event aims to give more families the chance to experience the Rouge's unique fall colours, and includes guided tours and round-trip transportation to the park from downtown Toronto.

"People are realizing they have this natural wonder right in their backyards," says Omar McDadi, the park's external relations manager. "When they see the explosion of colour, they can't look away. It's quickly becoming known as the place to see the leaves change in the GTA."

Last year, about 77 per cent of walk participants were newcomers. Organizers are hoping to get even more first time visitors at this year's event, which runs Oct. 4 to 10.

OPG has been a proud partner with Rouge Park since 2010, funding education and outreach initiatives, trail rehabilitation and the construction of the Vista Trail viewing platform.

"The Rouge is a great place to connect with Ontario's incredible biodiversity," says Ted Gruetzner, OPG's VP of Corporate Relations and Communications. "Located in our Pickering site community, it's a natural fit with our corporate biodiversity program."

Eventually, Rouge Park will span more than 79 square kilometers from Lake Ontario to the Oak Ridges Moraine. A bastion of history, culture and biodiversity, it's home to more than 1,700 species of plants, animals, fungi, and insects. To learn more about Rouge National Urban Park visit: www.pc.gc.ca/rouge.

DECODING THE STORY OF AN AKWESASNE HERO

For years, Pat Oakes knew almost nothing about her father's experience in World War II. A Senior Advisor of Indigenous Relations at OPG, Oakes believed that Alex Oakes – an Akwesasne Mohawk — served as a paratrooper in the U.S. Army's 82nd Airborne Division. But in a surprise announcement last September, his mysterious past was suddenly decoded.

"As it turns out, he was a Code Talker," says Oakes. An elite group, the Akwesasne code talkers used the Mohawk language to transmit secret messages between units. Oakes' father was stationed in France and the Netherlands, and received two Purple Hearts and a Bronze Star for Valor. He sadly passed away in 2008.

"I had no idea about this part of his past," said Oakes. "When I was a child, he would tell stories about the war. But he would never say anything specific, just that he was on secret missions. He never revealed what those missions were."

The Code Talkers were honoured this May in a special ceremony held in Akwesasne, which straddles the Canada-U.S. border along the St. Lawrence River near Cornwall. Standing in her father's place, Oakes was given one of 17 silver Congressional Medals. She was accompanied by Levi Oakes, her cousin and the last living Code Talker.

The Congressional Medal is the highest award that can be presented to an individual by the U.S. Congress. The Akwesasne medals were specially made by the U.S. Mint to commemorate the Mohawk Code Talkers, and are adorned with icons of Mohawk culture.

"My father was a proud Mohawk speaker," Oakes says. "We are so honoured and very proud of him and all the Mohawk Code Talkers and veterans who sacrificed a lot for our freedom."

Oakes' father's contributions go beyond the war effort. After the war, he played a key role in the Akwesasne community. He became Grand Chief in the 1960s, leading the community with quiet compassion. He also formed a veterans group for disabled residents who had been involved in several conflicts, including World War II and Vietnam.

A leader in her own right, Oakes is an active member of the Akwesasne and urban Aboriginal Toronto community. She also coordinates OPG's Native Circle, an internal network for Indigenous employees. The Native Circle organizes OPG's National Aboriginal Day programming, as well as the John Wesley Beaver Memorial Student Award Luncheon.

PAT OAKES (LEFT), ALEX OAKES (RIGHT)



HYDRO UPGRADES ADD MORE YEARS OF CLEAN POWER



Chats Falls Generating Station has been operating on the Ottawa River for more than 80 years, providing more than 192 megawatts of clean, renewable generating capacity – and there's plenty more on the way.

The site, which is co-owned by Hydro Quebec and OPG, is currently refurbishing critical parts of the station, which houses eight generating units. This \$40 million investment in Ontario's renewable future will provide another 40 years of reliable hydroelectric power.

"The project is going very well," says Brett Stewart, the project leader. "It's progressing on schedule and within budget, and the five-year project will be completed this year."

The massive refurbishment will improve both safety and performance, targeting a number of strategic areas. Crews have upgraded concrete at the station's stop log sluices, headworks and main dam gravity sections, and performed a number of electrical upgrades. To ensure another 40 years of safety excellence, nearly four kilometers of handrails are being replaced.

"Now in its final year of execution, the project is a good investment for our future," says Mike Martelli, President, Renewable Generation and Power Marketing. "These improvements will enhance dam safety and operational excellence by improving flow control, and restoring concrete structures to their original condition."

The return on investment is undoubtedly significant. Hydro stations are typically long-lasting, and will easily produce power for more than a century with proper care and maintenance.

Several of OPG's stations have celebrated their centennials, and are expected to continue operating well into the future. Eugenia Generating Station was the last to reach the milestone, commemorating its anniversary in 2015.

"We recognize the tremendous capabilities these stations have," says Martelli. "That's why we're making these investments. We pride ourselves in our robust hydroelectric maintenance and improvement program, because these projects help secure a clean, renewable power system for Ontario."

OPG REPORTS SOLID EARNINGS FOR SECOND QUARTER AS REFURBISHMENT PREP CONTINUES

OPG reported a solid second quarter for 2016 achieving a quarterly net income attributable to the Shareholder of \$132 million as it continues to prepare for Darlington's refurbishment this fall.

Net income attributable to the Shareholder for the first six months of 2016 was \$255 million compared to \$423 million for the same period in 2015. The decrease in net income was largely due to the planned decline in nuclear generation and higher nuclear outage operating expenses consistent with company expectations stemming from the timing of planned outage activities at the Darlington Nuclear Generating Station during the year.

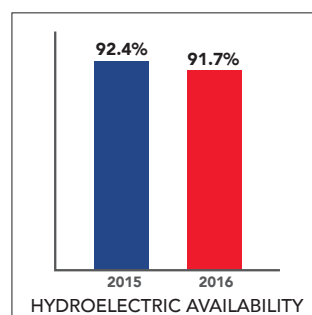
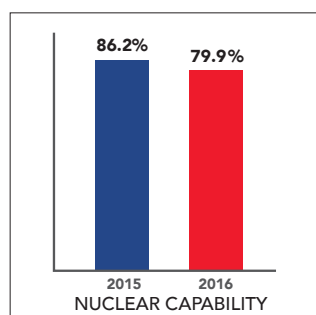
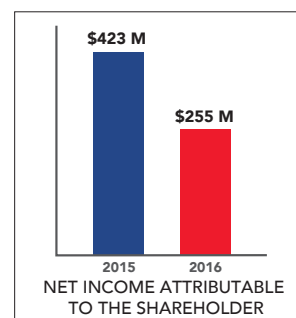
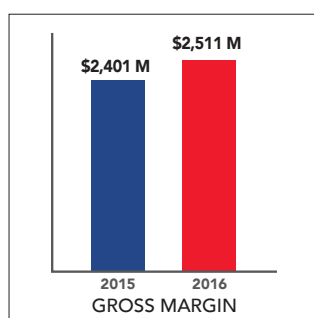
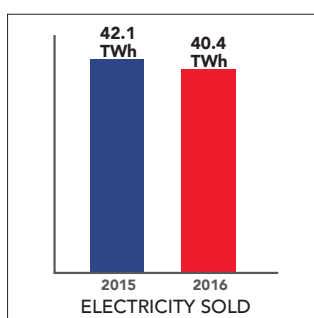
Overall the total generation for the second quarter was 19.4 TWh. This represents a slight decline from the same quarter in 2015, primarily due to a planned decrease in nuclear generation. This decline was partially offset by higher generation from the company's hydroelectric facilities.

OPG's nuclear capability factor for the six months ended June 30, 2016 was 79.9 per cent compared to 86.2 per cent reflecting the timing of planned outage work at both the Darlington and Pickering Nuclear generating stations.

Work also continued on schedule and on budget at the Peter Sutherland Sr. Generating Station and at Niagara's pump storage reservoir overhaul. Both projects are integral to OPG's clean power portfolio.

OPG's strong operating performance was underscored in June when an international industry assessment recognized the Darlington Nuclear Generating Station as one of the safest and best performing nuclear stations in the world for the third time in a row. It is the first time a plant outside the United States has received the recognition three times.

YEAR-TO-DATE JUNE 30 RESULTS





Ontario's economy just got a BIG boost.

Ontario's clean power workhorse, the Darlington Nuclear Generating Station, is going to be refurbished and that's great news for our economy:

- \$14.9 billion in economic benefits to Ontario
- 8,800 jobs annually
- \$8.5 billion to increase household revenues
- \$5.4 billion in government revenues
- \$94 million in exports

And 30 more years of safe, clean, reliable, low-cost power adds up to another \$50 billion in economic benefits. OPG is ready to deliver this important clean power project on time and on budget. Because we know the future is our most powerful resource.