POWER NEWS

SUMMER 2016

Connecting the people who power Ontario

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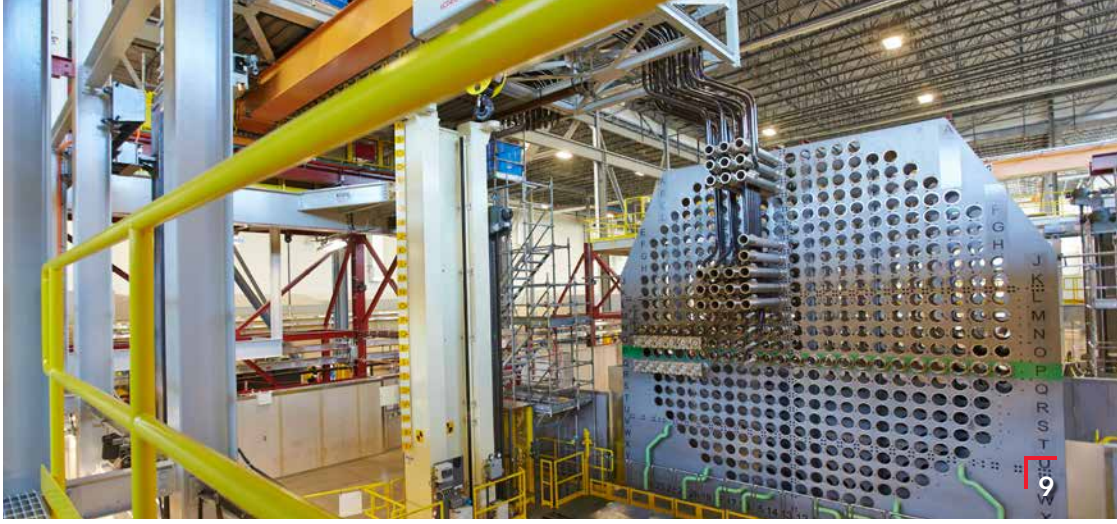

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NEW PARTNERSHIP HARNESSES THE POWER OF THE SUN

NANTICOKE STATION LANDS

After months of hard work, OPG has made an important step towards expanding its renewable energy capacity. Together with Sun Edison Canadian Construction LP and Six Nations Development Corporation, the company will develop a 44 megawatt solar generating station on its Nanticoke site.

Earlier this spring, OPG and its partners were awarded the project by the Independent Electricity System Operator. The Nanticoke solar project is the company's first foray into solar generation. Fittingly, the project will be built on a former coal generation site, bringing new life to the area and symbolizing the transition from coal to clean, renewable power.

"I am thrilled with this opportunity," says Jeff Lyash, OPG's President and CEO. "OPG is already Ontario's largest renewable energy producer and this will be an important addition to our already diverse portfolio."

"The project aligns with our community values of sustainability and environmental prosperity," says Matt Jamieson, Six Nation's Development Corporation President and CEO. "Investing in clean energy benefits the people of Six Nations economically without compromising our children's future. We look forward to working with our partners to make this project a success."

There's more to the project than clean power — the Nanticoke development also marks OPG's fourth partnership with First Nations. Hydroelectric projects with the Lac Seul First Nation and Moose Cree First Nation have helped bolster the company's clean energy portfolio further. Currently, OPG is also working with the Taykwa Tagamou First Nation on the Peter Sutherland Sr. Generating Station on New Post Creek.

OPG and its partners are now working together to obtain the necessary approvals and contracts for construction to begin in late 2017.

PICKERING'S PEREGRINE FALCONS CELEBRATE THEIR FOURTH YEAR AT THE STATION

PICKERING NEST BOX

DID YOU KNOW?

- Peregrine falcons can reach speeds greater than 300 km/hr in their trademark dives called "stoops."
- National Geographic recorded one bird reaching 389 km/hr.

It's shaping up to be another high-flying year at Pickering Nuclear generating station. A pair of resident peregrine falcons have returned to the station for their fourth year, producing four eggs.

Peregrines are designated a species of special concern in the province, and OPG has taken great care to ensure they have a safe nesting site.

"We worked with the Canadian Peregrine Foundation to make sure they have the best possible nest site," says Charmane Bhagan, an environmental advisor at Pickering Nuclear. "We installed nest boxes on several buildings with good drainage to optimize the egg and chick incubation."

While peregrines can seem invincible in the skies, raising chicks can be tricky business. The Canadian Peregrine Foundation says 80 per cent of young falcons won't reach adulthood, often dying when fledging or on their first migration. Last year, Pickering Nuclear employees worked with the foundation to care for Curie and Seivert, two falcon chicks named after units of radioactivity. The year before, they teamed up to rescue Flash, the station's only successful chick, from a violent storm.

"Some years are better than others," says Bhagan. "We now install surveillance cameras to keep an eye on the nests each year and intervene if required. We want to give these birds the best chance of success."

Even one surviving chick is an accomplishment for the peregrines, which were entirely eradicated from the province in the 1960s. Widespread use of DTT, a powerful and toxic pesticide, decimated their populations. They only began to reappear in 1986, after an intensive recovery strategy.

"They're incredible birds," says Bhagan. "Ontario is home to some of the most interesting species on the planet, and that's why we do this sort of thing. We take our role as environmental stewards seriously, and wherever possible, we take reasonable steps to preserve these species so future generations can enjoy them".

RICHARD HAYWARD

EMPLOYEE SPOTLIGHT
RICHARD HAYWARD

POSITION: FLM - IMS Dive Operations

WORK LOCATION: Port Hope

YEARS OF SERVICE: 10

FAVOURITE SPOT TO VISIT IN ONTARIO: North shore of Superior, Sault to Thunder Bay

FAVOURITE BOOK OR LAST READ: *The Professor in the Cage: Why Men Fight and Why We Like to Watch* by Jonathan Gottschall

FAVOURITE SONG: Radio Radio by Elvis Costello

FAVOURITE WEEKEND ACTIVITY: Right now it is rest, but dirtbiking with the kids is always a fun day and spending time with my wife

OUR PEOPLE: RICHARD HAYWARD

It was a cold, windy day in January when Richard Hayward, a Front Line Manager, Inland Diving Safety Specialist and member of OPG's Inspection and Maintenance dive team, arrived at Pickering Nuclear to help solve an impending operational challenge. Buffeted by a vicious polar vortex, Lake Ontario was covered in a record amount of pack ice. The massive floes, normally kept at bay by an ice boom, broke through three hundred feet of two-inch cable and filled Pickering's forebay.

"I said we could fix it," says Hayward, thinking back. "And everyone got behind us."

Hayward is part of OPG's dive team, a small group of underwater experts. From concrete restoration to welding, they tackle some of OPG's biggest challenges. "If someone can do it on land, we can do it on the water," Hayward says.

When the ice boom snapped, they spent weeks out on wintery Lake Ontario — pumping warm water into their dive suits to maintain body temperature — as they repaired the ice boom cable. According to Hayward, it was the best project he's worked on. "It was a huge success story," he says. "If I could do a job like that every winter, it would be fantastic."

A 10-year OPG veteran, Hayward has seen no shortage of underwater adventure. However, his interest in diving runs much deeper than his time leading the team. He's spent most of his life in the water, and first began diving at the age of 13. Now, Hayward performs a range of operations across the company.

"We rebuilt a travelling screen at Pickering, and by doing it in the water, we cut the project time in half," he says.

Much as he loves the projects he works on, Hayward says his team members are what really make his job special. "There's nothing more rewarding than seeing a group of individuals come together as a team and just excel," he says. "I am where I am because of the people who work with me."

AKWESASNE DISPLAYS AT ST. LAWRENCE VISITOR CENTRE

AKWESASNE HISTORY AND CULTURE SHOWCASED IN CORNWALL

You can almost hear the music through the glass, looking at the traditional Akwesasne instruments on display at the St. Lawrence Centre. The handcrafted items tell the story of a vibrant history and culture, accompanied by dozens of artifacts.

The instruments are part of *Indigenous Creations of the Natural World*, an exhibit documenting the rich Akwesasne culture and tradition. Presented by the Native North American Travelling College (NNATC), it showcases a variety of artifacts, from bone tools to pottery. It even includes a lacrosse stick, celebrating the Indigenous game.

"The lacrosse stick is really popular," says Matt Mulvihill, a communications officer in Eastern Operations. "What's really interesting is that it's made of hickory, because hickory is supple enough to mold. It's also a strong wood."

In addition to the travelling college's artifacts, the collection includes findings from Drouler's Archeological Site and the University of Montreal. Protected by glass, they fill the centre with energy.

"OPG is honoured to be the temporary guardians of these items," said John Hefford, OPG Regional Plant Manager. "And we're thrilled to provide an opportunity for people to marvel over the craftsmanship, history and talent of the Akwesasne."

It's not the first time OPG has partnered with the NNATC. "Our partnership with OPG has allowed the NNATC to produce several different initiatives, including the recent Salli Benedict exhibition," says Sarah Rourke, executive director of the NNATC.

Salli Benedict was revered in the community for her contributions to Mohawk culture and rights. The exhibit showcased her collection of handcrafted baskets.

Weaving together the rich history of Akwesasne Mohawks, *The Indigenous Creations of the Natural World* exhibit is an engaging look into the unique craftsmanship and artistry of the Mohawk community. It's free to the public, and will be on display at the St. Lawrence Visitor Centre throughout the summer.

MAJOR UPGRADES AT CANADA'S ONLY PUMP-STORAGE RESERVOIR

There are some major changes underway at Canada's only pump-storage reservoir. A scenic manmade waterway, the reservoir at OPG's Sir Adam Beck Pump Generating Station (PGS) has been providing Ontarians with clean, renewable power for almost 60 years.

"We are refurbishing the reservoir so that it can operate for another 50 years or more," says Mike Martelli, OPG's President Renewable Energy and Power Marketing. "The value of the PGS is that it uses electricity in off-peak periods to pump water into the reservoir so the water can be used to generate emission free power when electricity demand is high."

Built in 1957, the PGS can hold the equivalent of 8,000 Olympic-sized swimming pools of water and can pump 680 thousand litres of water per second.

A feat of engineering, the PGS is designed to make the most of water-use regulations. The reservoir is filled at night, when OPG is allowed to draw more water from the Niagara River. Water allowances are smaller during the day, so OPG uses the stored water to create more electricity.

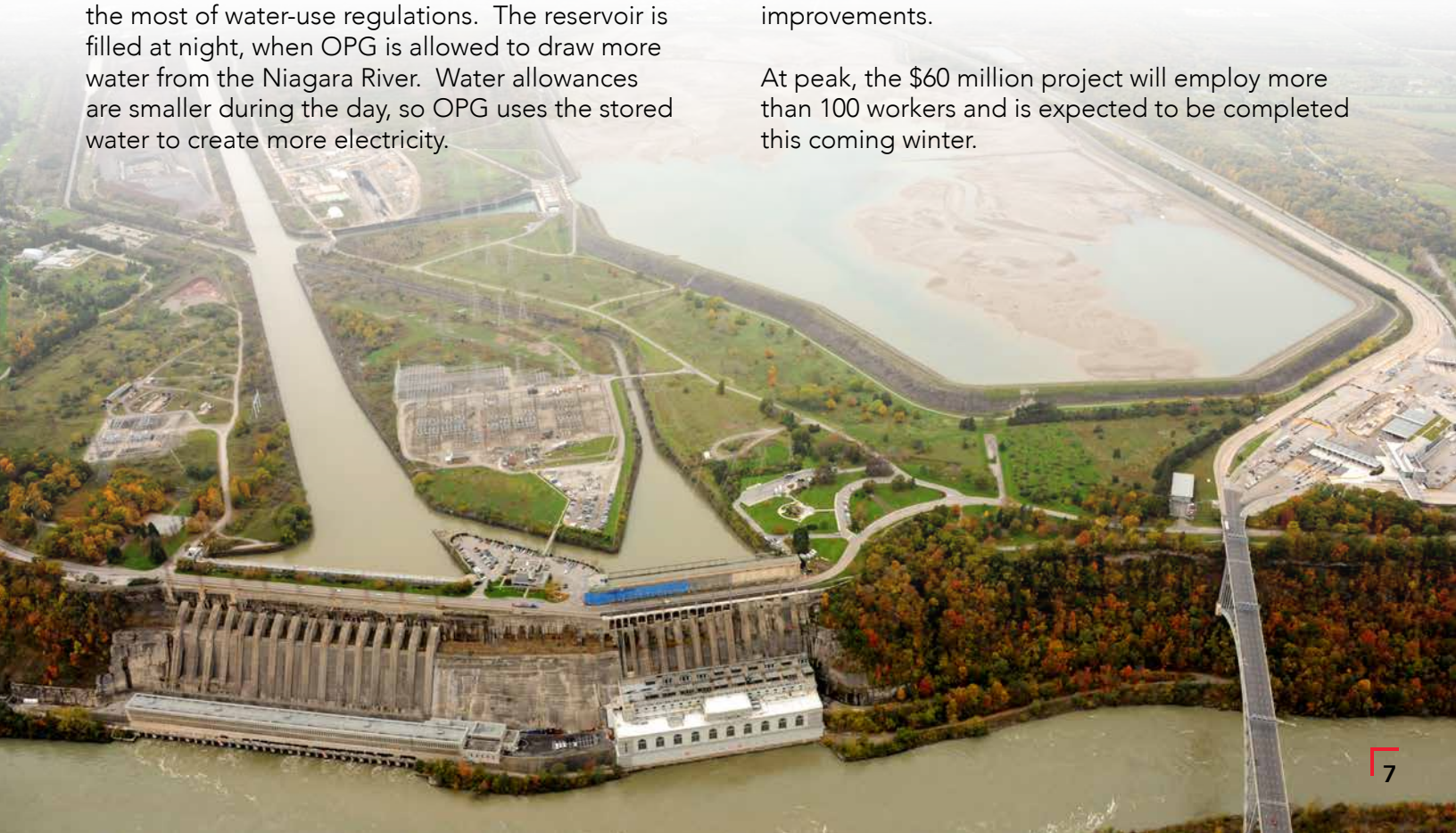
"It's like a big battery for the electricity system," says Martelli.

The PGS is a tremendously efficient system. By feeding water to the Sir Adam Beck Generating Complex, the reservoir can help generate up to 600 megawatts of additional power for up to eight hours – the equivalent of 100,000 electric car batteries.

The Beck complex is the flagship of OPG's hydroelectric fleet, and has a capacity of 2,100 megawatts. Depending on what's running on the grid, it can displace non-renewable generators like oil and gas.

With the 750 acre reservoir now drained, crews will install engineered liners over critical areas in the floor, as well as a bedrock grout curtain in one corner. Several smaller-scale repairs will also take place, and OPG has already completed a series of measuring, monitoring, drainage and landscaping improvements.

At peak, the $60 million project will employ more than 100 workers and is expected to be completed this coming winter.



UNIVERSITY PARTNERSHIP HELPS POWER RANNEY FALLS UPGRADES

RANNEY FALLS QUEEN'S-RYERSON UNIVERSITY PROPOSED MODEL

Though the proposed Ranney Falls redevelopment project is still in the planning phase, engineers and employees alike can now see the effect it will have on the station's site – without going to Campbellford. It's all thanks to the hydraulics experts at Ryerson University, who have been working out of the Queens University Coastal Engineering Lab to construct a 1:25 scale model of the proposed generating station.

From afar, it looks like a very advanced water table. A miniature Trent River flows into a scale model of the proposed redevelopment, where instruments measure water levels, velocities, and structural vibrations. Measuring about 13 metres long and four metres wide, the model includes everything from the forebay to the trailrace, and provides an in-depth look at the water's characteristics at the station's entrances and exits.

"It's very useful," says Iskander Boulos, a Senior Manager of Corporate Business Development at OPG. "Every year OPG utilizes university projects performed by students, but this is the first time Ryerson University Hydraulic Team experts have done a physical model for OPG. It's excellent."

OPG provided the funding for the project, and will receive valuable data for the project's definition phase design work. The Ranney Falls redevelopment includes replacing the station's third generating unit, which reached end of life, with a larger, more efficient unit in a new separate powerhouse. The project is expected to double the station's capacity.

The Queens-Ryerson model is the first physical model OPG has commissioned in over a decade. While computer modelling largely replaces the practice now, Boulos says physical models were widely used throughout OPG's history.

"Before computers were advanced enough to handle the modelling, we built physical models to optimize our projects," says Boulos. "That's what we did for Big Chute GS, for example. There was a massive concrete one for Sir Adam Beck II at Niagara Falls." Results from the physical model testing will help calibrate and enhance site configuration using the computer modelling.

Matt MacDonald, project director, said "It's fun to watch it in action, but more importantly, it's tremendously useful for us to visualize the unique hydraulic configuration at the Ranney site in order to optimize the proposed design."

If approved, the Ranney Falls redevelopment project will be a great addition to OPG's clean, renewable power portfolio.

DARLINGTON ENERGY COMPLEX

TOOL TESTING UNDERWAY AT DARLINGTON ENERGY COMPLEX

With the Darlington refurbishment just over 100 days away, preparations are in full swing. Employees are now going through extensive tool testing, working in Darlington's mock-up reactor as a "dry run" for the project itself.

The mock-up is an exact replica of a Darlington CANDU nuclear reactor, right down to its eight-metre-high reactor face. It comes complete with all the components employees will be working to replace or refurbish, including 480 fuel channels, feeder tubes and fuel channel assemblies. The first of its kind in Canada, it has been installed at the Darlington Energy Complex to give workers the best possible preparation for the project.

The training has been designed to be as realistic as possible. Wearing full protective gear and hooked up to a supply of oxygen, each of the workers will get a clear understanding of the complexities and simulated environment of working inside the actual Darlington reactor vault.

"This project is an integral part of Ontario's future energy portfolio," says Roy Brown, OPG's Senior Director of Nuclear Projects. "It's essential we're proactive in our preparations."

Training will focus on the challenges, constraints and potential hazards employees may face when executing work at the reactor face. It gives employees the ability to practise techniques, test procedures and processes and familiarize themselves with the tools and working conditions before entering the real reactor.

"It's not just a benefit to long-time nuclear veterans," adds Brown. "The mock-up also provides an authentic experience for workers who have never been in a reactor before. This inside knowledge will be essential when the real refurbishment kicks off on Oct. 2, boosting economic activity an average of 8,800 jobs over the life of the project."

REFURBISHMENT BY THE NUMBERS

$12.8B	Investment
$14.9B	Boost to Ontario's GDP
8,800	Average number of jobs created over the life of the project
60+	Ontario companies and contractors supplying components for the project
30	Additional years of reliable, low-cost clean power to Ontario consumers

OPG'S BRING BACK THE SALMON PARTNERSHIP BRINGS FISH HATCHERIES TO GRADE 7 STUDENTS

CHRIS ROBINSON

Just keep swimming. That's the advice given to nearly 100 young Atlantic salmon as their student companions release them into Duffins Creek. After four months in a hatchery at Pickering Nuclear, it's time for the fish to join with the greater Lake Ontario population, albeit with names like Nemo, Pan-Fry, and Sushi.

Forty Grade 7 students have been learning about the fish all year, watching them grow from eggs to fry at OPG's Pickering Nuclear Information Centre. It's all part of the Bring Back the Salmon program, a partnership with the Ontario Federation of Anglers and Hunters (OFAH) aimed at restoring Lake Ontario's Atlantic salmon population.

"We give them 100 eggs for the Pickering hatchery in January, and by the spring they (the students) release the fry back into Duffins Creek," says Chris Robinson, the program's coordinator. "It's always a really fun day for everybody, though it can be somewhat sad to see the fish go."

Pickering Nuclear has been supporting the program with OFAH for five years, giving one school the opportunity to host a salmon hatchery each year. The fun doesn't end with fish – the four-tiered program also emphasizes habitat restoration and responsible stewardship.

"It's really interesting to see the program progress," says Cheryl Johnston, OPG senior communications advisor. Johnston, who helped create and develop the OFAH hatchery partnership, adds "As the students get more involved, you start to see the environmental stewardship really come through."

Among other activities, the program hosts a park cleanup and a day of volunteering with Toronto & Region Conservation Yellow Fish Road program. According to Robinson, the varied initiatives are aimed at creating lifelong protectors of biodiversity.

"These students are the adults of the future," says Robinson. "They'll be looking after this creek."

Already, the students' hard work is paying off. The province-wide Lake Ontario Atlantic Salmon Restoration Program – one of OPG's major corporate sponsorships – has stocked more than 3.4 million salmon since 2011. In 2014, a report by the Ontario Ministry of Natural Resources and Forestry showed the salmon fry exceeded expectations for growth and survival in their first year.

It's a great success with a promising future, but Johnston says the real accomplishment is with the kids.

"They have such a full understanding by the end," she says. "I go walking by the creek and run into kids from five years ago, coming with their families. One frequent visitor always tells me 'I have to check on Sushi! I have to see if he's back!'"

"It's just amazing to see."

OPG REPORTS SOLID FIRST QUARTER OPERATIONAL AND FINANCIAL RESULTS

OPG reported a solid start to its fiscal year with generation levels steady on a quarter-to-quarter basis for the first three months of 2016.

Earnings from its electricity generation business segments of $320 million compared to earnings of $337 million in the first quarter of 2015.

Net income for the first quarter of 2016 was $128 million, compared to $239 million for the same quarter of 2015 mainly due to lower earnings from the Decommissioning Segregated Fund.

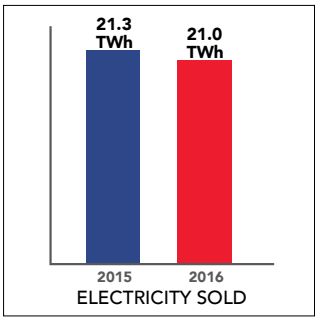
Nuclear capability factors at both the Darlington and Pickering Nuclear sites remained strong solidifying the company's confidence in safely and reliably operating these stations throughout Darlington's approaching refurbishment, which has moved from the planning stage to the execution stage. The first reactor to be refurbished will be taken off-line in the fourth quarter.

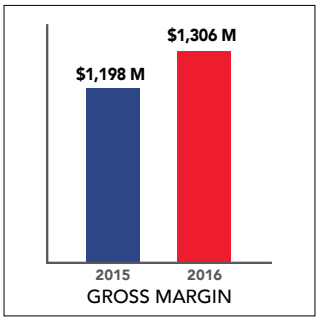
"The excellent performance at Darlington Nuclear reinforces our conviction that we'll be able to operate it safely and efficiently for at least 30 more years after refurbishment," said President and CEO Jeff Lyash.

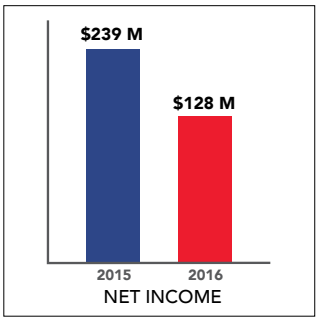
Total electricity generated in the first quarter of 2016 of 21.0 terawatt hours (TWh) was comparable to the 21.3 TWh generated in the same quarter in 2015.

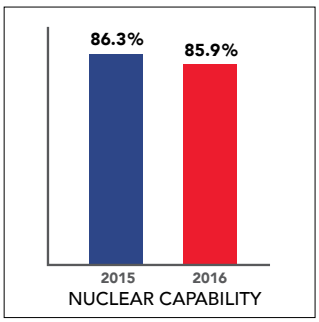
The company also continued construction on the Peter Sutherland Sr. GS, a 28 MW hydroelectric station on the New Post Creek in northeastern Ontario." This makes for a total of four Indigenous partnerships for OPG, all of them to build clean generation that is free of GHG emissions," said Lyash. "The projects also provide commercial and social benefits to the participating First Nations."

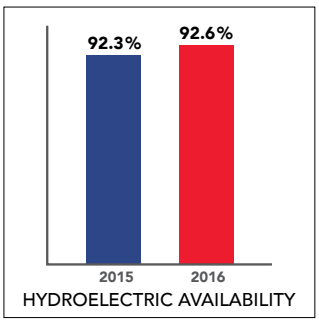
YEAR-TO-DATE MARCH 31 RESULTS











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