One the largest infrastructure projects in Canada over the past decade came to an end recently when Bruce Power’s Units 1 and 2 were reconnected to Ontario’s electricity grid.

This first-of-a-kind refurbishment project returned the Bruce A generating station back to its full capacity, after it was left dormant in the late-1990s by the former Ontario Hydro. After a successful return of Units 3 and 4 in 2003 and ‘04, and now the rebirth of Units 1 and 2, Bruce Power has become the world’s largest operating nuclear facility, providing 6,300 megawatts of low-cost, clean, safe and reliable power to the people of Ontario.

During the Restart, our partners in the construction and nuclear industry completed some incredibly innovative projects that many felt were not possible in a CANDU nuclear facility. For example, it took thousands of hours of planning and meticulous engineering to peel back the roof of Bruce A and, for the first time in the history of Canada’s nuclear industry, remove and replace eight steam generators, using one of the world’s largest cranes.

Inside the vault, Atomic Energy of Canada Ltd. (AECL) used first-of-a-kind remote control tooling to cut out the original reactor components, which were radioactive from years of service. Miles of tubing and nearly 1,000 fuel channel assemblies were replaced in the two units, marking the first time a CANDU reactor has been completely overhauled and ‘retubed.’

There were also over 3,600 valves replaced in the two units, while our massive turbine generators were inspected and overhauled during the project.

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Restart brings new life to the shoreline

Bringing life back to Bruce A has been a labour of love for not only me, but for the thousands of people who have played a role in its return.

Since Bruce Power was formed in May 2001, not a day has gone by where I haven’t thought about the effort it takes to restart all four units, which were shut down in the 1990s. We achieved half of our goal when Units 3 and 4 were returned in 2003 and ’04, and with the return of Units 1 and 2 in the fourth quarter of 2012, we have reinvigorated Bruce A, the entire site, and our neighbouring communities.

Although Unit 4 is currently on an extended planned maintenance outage, it will return in the coming weeks, making Bruce Power the world’s largest nuclear facility, with eight units providing 25 per cent of Ontario with low-cost, clean, safe and reliable power.

When this occurs it will be one of the proudest days of my career.

The Restart Project was one of Canada’s largest infrastructure projects of the past decade, and some in the industry wondered if our programs could ever be done. Although we experienced some bumps along the way, we persevered, learned lessons that helped us improve, and used innovation to complete many first-of-a-kind manoeuvres that will benefit the entire industry in the coming years.

When we took over this site in 2001, we had four units that were dormant and we set ourselves a goal of bringing them back to life. It has been a long, hard difficult road that has required a lot of commitment from our staff, investors and the community, but I’m proud to say we have achieved our goal.

When I first came here, before Bruce Power took over the site, I was shocked to see the signs on peoples’ front yards about the closing of Bruce A and retubing the Bruce. It was obvious the community felt victimized. The plant was shut down, to the surprise of the community, and it was never really fully explained to them. You could see the devastation in terms of jobs and the corresponding hit to local businesses.

Just over a decade later, Bruce Power has helped restore the ability for young people to have a rewarding career and raise a family along the Lake Huron shoreline. We have hired 2,700 new employees since 2001 to replace the 1,200 staff who have retired. In 2001, only eight per cent of employees were under 35 years of age, but by 2011 that percentage had risen to 25. This has resulted in resurgence in the local economies of our neighbouring communities, a positive spike in housing developments, and the return of large classes in local elementary schools.

The Restart Project has provided so much more than electricity to the province – it has given the community in which we operate another opportunity to thrive, after the future looked so bleak at the turn of the century.

Now that Units 1 and 2 are set to operate for at least the next 25 years, we will focus on extending the life of our other units to secure the long-term future of the Bruce site and provide excellent careers for future generations.

Thank you to all who have played a role in the Units 1 and 2 Restart Project. Your hard work, dedication and innovative thinking have set the standard for the world’s nuclear industry.

Duncan Hawthorne
President and Chief Executive Officer
In fact, the groundbreaking achievements of Bruce Power and our contractors are too numerous to list in full. Every step of the way, new challenges were met and overcome through innovation, teamwork and a commitment to the success of the Restart Project.

During this time we learned many lessons, which were then implemented into other aspects of the project. Although Unit 2’s work schedule was nearly a year ahead of Unit 1 in the early going, the experiences we gained during the lead unit’s program were then implemented in Unit 1, creating great advancement in the schedule of the latter unit. In fact, due to a generator issue outside of Bruce Power’s control, which was discovered mere minutes before Unit 2 was to synchronize to Ontario’s power grid in May, Unit 1 was the first to provide electricity to the province, a monumental achievement and a testament to Bruce Power’s culture of continuously improving our processes and procedures.

Much of the work to restart Bruce A involved unchartered territory for the nuclear industry. The experience gained will serve other operators in the province well, as more reactors reach the end of their current life cycles.

With both Units 1 and 2 now providing energy to Ontarians and Unit 4 currently undergoing a multi-million dollar life-extending maintenance outage, Bruce Power has become the world’s largest operating nuclear facility, with eight units producing 6,300 megawatts of low-cost, clean, safe and reliable energy. The Bruce site will be responsible for 25 per cent of Ontario’s electricity and an integral part of the province’s energy future as it shuts down coal-fired generating stations by the end of 2014.

Through continuous improvement and significant investment in maintenance programs, we have increased the reliability of our nuclear units. With Units 1 and 2 now poised to operate through 2043, the company is well-positioned to extend the life of the remaining six units as required, to deliver safe electricity for this generation of Ontarians and the next.

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Nuclear operators at Bruce A keep a close eye on Unit 2 during its synchronization to Ontario’s electricity grid on Oct. 16. The unit, which is producing power for the first time in 17 years, was declared commercially operational on Oct. 31, effectively putting an end to the Restart Project.
Bruce Power proved its ability to respond to the most serious of emergency scenarios, during the Huron Challenge Trillium Resolve exercise, held Oct. 15-19.

“This exercise was proof of concept and we demonstrated that all of the post-Fukushima enhancements we’ve put in place worked to a very high level,” said Frank Saunders, Vice President, Nuclear Oversight and Regulatory Affairs.

In the scenario, the Bruce Power site was hit with a series of simulated challenges, the most severe being a tornado matching the strength of the one that struck Goderich in 2011. The challenge called for a loss of all power and no access to back-up emergency generators – a highly unlikely occurrence.

Trained emergency staff responded in real time on both the ground and in Bruce Power’s new, state-of-the-art Emergency Management Centre (EMC), located at the Visitors’ Centre.

The EMC was staffed and operated around-the-clock for three days. While our emergency crews responded with pumper trucks and generators to both stations, plant operations staff aligned systems to accept the portable cooling water that was pumped by fire crews for 24 straight hours using newly purchased equipment. Fire trucks were also refueled while they continuously pumped the water necessary to keep the reactors in a safe state.

“The teamwork between plant operations and emergency response worked flawlessly, and we were able to successfully demonstrate an additional method that could keep the reactors cool in the event of a total loss of power,” Frank said.

The scenarios faced by emergency responders were realistic and challenging, as crews had to clear roads that were blocked with trees and overturned cars from the storm’s damage, on their way to the stations.

Wade Lacroix, Chief of the Emergency and Protective Services Division, was impressed with what he saw.

“From my perspective, this validates our decision from a year ago to merge security, emergency response and emergency planning into one integrated organization,” Wade said. “I saw an incredible level of cooperation and the Emergency and Protective Services division operated in a highly professional, seamless way.”

Bruce Power was one of more than 50 agencies involved in the week-long exercise organized by Emergency Management Ontario that saw well over 40 scenarios played out by roughly 1,000 participants in the region.

Based on what he saw, Frank said Bruce Power can survive any weather event Mother Nature can throw at it.

“One of the key learnings from Fukushima was that communications were knocked out and operations and responders found it very difficult to talk to each other; while at the same time, off-site communications with the public was challenged as well,” he said. “We’ve developed a very robust communications infrastructure both internally and externally that will allow us to communicate when we need it most.”

Bruce Power also:
- Overturned a truck near Ripley to test its transportation emergency response procedures, which included the OPP and Ripley-Huron Fire Department.
- Received Canada’s first-ever emergency test broadcasting licence for portable AM units, which will make communicating during an emergency more effective than ever before. The AM radio stations will be used in conjunction with various other methods of communication, including FM radio frequencies, the Internet and TV, to name a few.