

Message from the President

Canada's Nuclear Industry: The Yin and Yang

Hydro Quebec's decision to close Gentilly-2 is not good news for Canada's nuclear industry. It also highlights the problems the industry faces from the ongoing uncertainty surrounding the future of Atomic Energy of Canada Limited (AECL). Hydro Quebec's press kit referenced this uncertainty as a contributing factor to their decision.



Fortunately, several positive counterbalancing developments have occurred in the last six months. Back in July of this year, Canada announced that it had signed a supplementary protocol to the long-standing Canada-China Nuclear Cooperation Agreement. This agreement will help Canadian companies increase uranium exports to China. In September, a nuclear cooperation agreement was signed with the United Arab Emirates (UAE) allowing Canadian nuclear companies to deal with designated civilian nuclear installations in the UAE. Most recently, Canada announced a new nuclear accord with India. This will better position Canadian companies to sell nuclear materials and technology to India.

The October 2012 *Canadian Nuclear Association—Canadian Manufacturers and Exporters' Study* underscores the importance of sustaining a strong Canadian nuclear industry. The report notes "current mining and plant operations, including refurbishment projects contribute \$7.9 billion annually to the Canadian economy. Constructing a new two-reactor plant at Darlington is projected to raise this total to \$12.7 billion for five years."

My last President's Message included a list of the prestigious, knowledgeable organizations—Canadian Council of Chief Executives; the Standing Senate Committee on Energy, the Environment and Natural Resources; and the Association of Power Producers of Ontario--that recognize the important role nuclear power can play in meeting Canada's future energy needs while generating significant economic wealth. In October, Canada's National Roundtable on the Environment and the Economy added its name to the list.

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However, two obstacles need to be addressed before this future and associated benefits can be realized. First, Ontario needs to select the CANDU Enhanced 6 reactor for the new units planned for Darlington. Second, the federal government needs to help secure financing for this new build project and more aggressively support the export of Canadian nuclear technology.

Our role is to make sure Canadians know what's at stake and encourage them to influence their elected representatives.



Hydro Quebec Decides The Fate of Gentilly-2

Following the election of the new Parti Quebecois government, Hydro Quebec announced on October 3, 2012 that it would be closing the Gentilly-2 nuclear plant. In accordance with its operating licence from the CNSC, the plant will operate until the end of 2012. During the next 18 months, steps will be taken to shutdown and mothball the plant. The overall decommissioning process is estimated to cost \$1.8 billion and take 50 years to complete.

Hydro Quebec cited several factors for not proceeding with the planned refurbishment of the facility. These included: the problems identified during the Point Lepreau and Wolsong projects; the uncertainty surrounding the future of AECL; and escalating refurbishment costs and the resulting cost of energy from the plant.

Hydro Quebec has indicated that it will hold public information sessions in conjunction with the CNSC. Hydro Quebec will be required to submit an application for a decommissioning licence to the Commission before any work can proceed. This will include details on how it intends to dismantle the facility and a financial guarantee based on the decommissioning plan. CNSC staff, following their review of Hydro Quebec's application, will determine the need for an environmental assessment.

On November 13, 2012, the Quebec National Assembly approved the establishment of a commission to study the impacts of decommissioning Gentilly-2 and to develop an economic diversification plan for the areas of Centre-du-Quebec and Maurice. The commission will report back to the National Assembly no later than February 21, 2013.

Bruce Power Keeps Powering Up

On October 23, 2012, Bruce Power announced that Unit 1 had achieved commercial operation. Unit 2 followed suit on October 31, marking the completion of company's Restart Project, the largest infrastructure project of the past decade. Both units had been out of service since the mid-1990s. Units 1 and 2 had been laid up in a safe shutdown state since 1997 and 1995 respectively. The successful return to service of these two refurbished 750-megawatt (MW) units required the planning, integration and execution of millions of complex tasks.

Duncan Hawthorne, President and CEO attributed this success to the people in the company. He noted the strong technical competency of the more than 4,000 full-time employees. Hawthorne also recognized the Trade Unions which represent the majority of them, and who are also investors in the business as well as the Ontario Building Trades.

Unit 3 at Bruce A and all Bruce B units are operating at full power. The Bruce A Unit 4 is undergoing a planned outage and is expected to be completed later this year. The 6,300 MW at the Bruce Power site are a critical part of Ontario's Long-Term Energy Plan for providing a reliable, low cost, low carbon supply of electricity. Hydro One also successfully completed a second, double circuit 180 kilometre 500 kilovolt transmission line from the Bruce to Milton that will help deliver power from the Bruce Nuclear complex to Ontario consumers.

In mid-October, Bruce Power participated in a successful province-wide emergency exercise involving over 50 organizations and municipalities. The exercise called Huron Challenge—Trillium Resolve was led by Emergency Management Ontario. Simulating a natural disaster affecting Bruce County, the exercise involved a variety of scenarios that would need to be responded to by emergency response groups. Bruce Power used the opportunity to test its new Emergency Management Centre, which is located off-site, and the company's on-site first responders and security personnel.

OPG's Nuclear Investments on Course

On October 25th, the CNSC announced that it was revising the dates for public hearings regarding three matters related to OPG's Darlington nuclear site: Environmental Assessment of OPG's proposed refurbishment and continued operation of the station; OPG's application to renew the operating licence for the Darlington Waste Management Facility; and, OPG's application to renew the operating licence for the Darlington station until December 31st, 2014. The hearings will be held December 3rd to the 6th, 2012 in Courtice, Ontario.

The refurbishment of the 3,500 MW four reactor plant will take about 15 years to complete. Work will commence in 2016 with Unit 2. OPG is constructing a 300,000 square foot training facility, containing an exact replica of a nuclear reactor that workers will train on.

The Environmental Assessment for OPG's new build project is complete and the licence to prepare the site was approved by the CNSC in August 2012. OPG announced

in June that it had signed agreements with Westinghouse and SNC-Lavalin/Candu Energy Inc. to prepare detailed construction plans, schedules and cost estimates for the two proposed reactors at Darlington. The two reactor designs in play are the AP 1000 reactor and the Enhanced Candu 6. The bids from the two companies are due to OPG in June 2013 and the province will then make the final decision based on its review of the bids.

Recently, OPG's Darlington Nuclear facility was honoured by the Institute of Nuclear Power Operations for being among the top performing stations in the world. The award recognized management and leadership, operator knowledge and skills, equipment performance, condition of the station, emergency management and OPG's strong response to the findings from Fukushima.

OPG is able to achieve these results in spite of the low prices received for electricity generated by the company. This averaged 5.1 cents per kilowatt hour in the first nine months of this year (down from 5.3 in the first nine months last year). By comparison private sector generators received 8.6 cents or almost 70 per cent more than OPG.



Darlington Nuclear Station,
Courtesy of Ontario Power Generation

A Low Carbon Vision for Canada

In October, the National Roundtable on the Environment and the Economy (NRTEE) issued its final climate change report, *Framing the Future: Embracing The Low Carbon Economy*. The report noted that the transition to a low-carbon economy will require policy certainty, a price on carbon, a level playing field and efficient regulations that complement market based measures to reduce greenhouse gas emissions.

The NRTEE noted that Canada has significant and diverse low-carbon energy opportunities across the country.

Nuclear energy was cited as one of them and outlined the significant economic benefits provided by Canada's nuclear industry.

Although Canada's nuclear industry has been in decline in recent years, the NRTEE noted Canada's 60 years of world leadership in nuclear technology and the significant capacity that exists. Reference was made to the importance of the underway reactor refurbishments and the proposed new build project at Darlington.

Selecting the CANDU 6 reactor for the latter was described as pivotal in terms of the potential to winning international projects and growing Canada's nuclear industry.

Good News for Point Lepreau

November 2, 2012 was a good news day for NB Power. The CNSC announced approval to increase reactor power at the Point Lepreau station above 35 per cent of its full capacity. The plant began producing power on October 24, 2012 for the first time in four years. When the 660-megawatt plant returns to service it will produce enough electricity to power over 330,000 home per year for the next 25 to 30 years.

The CNSC will continue to monitor the remaining commissioning activities as the plant moves closer to being returned for commercial dispatch. Final commissioning steps include tests involving increases and decreases in reactor power and connecting and disconnecting the generator from the grid.

Ramzi Jammal, CNSC Executive Vice President and Chief Regulatory Operations Officer stated that, “The refurbishment of the Point Lepreau Generating Station has allowed New Brunswick Nuclear Power to modernize the facility to include additional safety features, which are now required by the CNSC at all nuclear power plants in Canada, in response to the Fukushima accident.”

This project was the first time Atomic Energy of Canada Ltd. refurbished a Candu-6 reactor. The project is about 3 years behind schedule and \$1 billion over budget. The New Brunswick government is continuing its efforts to have the federal government cover the cost overruns associated with the project.



Point Lepreau Nuclear Station,
Courtesy of NB Power

Cameco's Strategy for the Future

Cameco laid out its going forward strategy on October 31, 2012 as part of the company's third quarter financial results. The company indicated that it remained confident in the long-term fundamentals of the global nuclear industry.

There is a need to fuel 431 currently operating reactors with 64 new reactors currently under construction. Cameco also expects (recognizing market factors continue to evolve) that there will be 80 net new reactors constructed over the next decade compared to the previously anticipated 95.

Citing recent nuclear developments, especially those in Japan, Cameco decided to adjust its focus going forward. The company has revised its cumulative world uranium demand forecast by 50 million pounds to 2.1 billion pounds for the period to 2021 but will continue to monitor market developments. Additionally, the company will focus primarily on Brownfield projects and defer the development of Greenfield projects, which will achieve about 36 million pounds of annual supply by 2018 (previously expected to be 40 million pounds).

Cameco intends to spread capital spending over a longer period while reducing project related expenses. There is good news for many of Cameco's Canadian operations with investments (subject to market conditions): bringing the Cigar Lake project to production; expanding production at the McArthur River mine; refurbishing and expanding the Key Lake mill; extending the life of the Rabbit Lake mine; and advancing the Millennium project to secure regulatory developments so that this project could be developed independently.

Worth Repeating....

“The Canadian nuclear industry directly and indirectly employs 60,000 Canadians. 30,000 Canadians are employed directly by the industry – primarily in uranium mining and power generation operations – plus an additional 30,000 spin-off jobs in communities or other industries that are generated indirectly by the increase in population brought on by a particular project....

- Growth in northern Saskatchewan's uranium mining capacity;
- Mid-life refurbishment of ten more CANDU nuclear reactors at nuclear power plants over the coming eleven years;
- Proceeding with construction of two new CANDU reactors.

These investments – already written into Ontario's Long-Term Energy Plan (LTEP) and elsewhere – will deliver long-term affordable clean air power while yielding a conservatively projected 40 per cent growth over five years in Canada's highly paid, high-knowledge nuclear workforce.

That's about 12,000 direct new jobs by 2017 and similar number of spin-offs, totaling 24,000 jobs.

Building a new two-reactor power plant at Darlington will directly employ more than 10,000 people, and will support employment for over 10,000 others in Canada, for approximately a five-year period.”

Source: CNA-CME 2012 Study: Nuclear, a Canadian Strategy for Energy Jobs and Innovation, Canadian Manufacturers & Exporters (CME), October 2012



Rabbit Lake Project,
Courtesy of Cameco

In short...

A Loss for Canada's Nuclear Industry

October marked the passing of two of Canada's most distinguished nuclear pioneers, John Runnalls and Jim Harvie. The significant contributions of both men helped make Canada's nuclear industry a leader in safety and innovation.

John Runnalls held a number of senior management positions during his twenty-year career with Atomic Energy of Canada Ltd (AECL) at Chalk River. Over the next 18 years, Dr. Runnalls contributions to the industry continued: senior advisor to the federal government; EVP of Uranium Canada Ltd.; and, 1st incumbent Chair in Energy Studies and Chairman of the Centre for Nuclear Engineering at the University of Toronto. He served on the Boards of the Canadian Energy Research Institute, Canadian Nuclear Association, Ontario Hydro, and URANERZ.

Jim Harvie joined AECL at Chalk River in 1966 and as a mathematician, worked on various projects with the Thermo-hydraulic Analysis Unit. In 1974, Jim moved to the Atomic Energy Control Board (AECB) and started work as an inspector (Project Officer) at the Bruce Nuclear Power Development. In 1991 he became the Director-General of the Research and Safeguards Directorate. Following his retirement from the CNSC in 2002,

Jim held various senior positions with the Ottawa Branch of the Canadian Nuclear Society.

Progress Update on Nuclear Reactor Designs

On November 9th, 2012 Dr. Michael Binder, President of the CNSC provided the board of Candu Energy Inc. with an update on the status of the Commission's review of reactor designs. All new designs are subject to the CNSC's modified design requirements post Fukushima. The Phase I review of Candu Energy Inc.'s EC6 design (750 MWe) was completed in March 2010. The Phase II review was completed in April of this year and no fundamental barriers to licensing were identified. The Phase III review is expected to be complete by the end of June 2013.



*Michael Binder,
Courtesy of CNSC*

The Phase II review of the Westinghouse, AP1000 design (1100 MWe) is expected to be complete by the end of June 2013. The Phase 1 review, expected to be completed in early June 2013, for the ATMEA1 design (1100 MWe), a joint venture of Areva and Mitsubishi Heavy Industries is underway. As well, the Phase 1 review for the (SMR) Generation mPower design (180MWe) review is underway with completion expected in late 2013.

The Canadian Nuclear Workers' Council is an organization of workers represented by unions working in various areas of the Canadian nuclear industry which includes uranium mining, nuclear fuel processing, nuclear power stations, radial isotope production for medical and industrial purposes, and nuclear research.

Nuclear Facilities and the Importance of Communications

An environmental activist from Peterborough has helped create a controversy over a GE-Hitachi fuel processing facility in Toronto. Residential development now surrounds this four story industrial building that has been processing uranium powder into fuel pellets for almost five decades. The pellets are then shipped to Peterborough to be assembled into fuel bundles.

Local residents became anxious as a result of the activist's door knocking and warning about the safety of the plant. Company officials arranged for the media to tour through the area of the plant where the uranium pellets are shaped and inspected. The company also participated in a raucous community meeting on Nov. 15, 2012. The Canadian Nuclear Safety Commission granted the GE-Hitachi facilities in Toronto and Peterborough a 10-year licence in 2011.



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TEL 416 725-5776

FAX 416 481-7115

e-mail dshier@pwu.ca

Contributions should be sent to the above address.

PUBLISHER: David Shier

EDITOR: Paul Newall

The member groups are:

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