Spotlight on suppliers: BWXT

John MacQuarrie, the president of BWXT Canada has a pedigree as Canadian as CANDU itself. Described by those who know him in the industry as ‘easy going’ and ‘friendly,’ his manner is quintessential Canuck as are his two engineering degrees from the University of Toronto. So too, his nuclear roots, starting with a three-year stint at Atomic Energy Canada Ltd. (AECL) as a fuel engineer before he joined what was then known as Babcock & Wilcox Canada in the mid nineties.

The company he leads, BWXT Canada Ltd., may have a U.S. parent but in the Cambridge, Ont. plant that serves as its Canadian headquarters, the vibe -- personified in the super-sized flag on the wall and the Maple Leaf emblems on workers’ hard hats -- reflects CANDU pride.

In some jurisdictions of the challenging U.S. nuclear market, even strong performing plants are in a fight for their lives, competing against cheap natural gas. In contrast, the refurbishment at Ontario Power Generation’s Darlington plant, and the major component replacement (MCR) project on Bruce Power’s units, make for bullish conditions for suppliers here. Ontario is a growth area for nuclear suppliers who possess the right mix of competencies and culture.

“BWXT is very supportive of the Canadian market,” says MacQuarrie. “It is a really attractive market and we’ve had a solid Canadian presence for over 150 years.”

And, unlike in the U.S. where current political policy does not look to be helpful to greenhouse-gas reducing technologies such as nuclear, in Ontario, MacQuarrie says, “There is a nice nexus of provincial and federal policies,” that are helpful to the industry.

BWXT Canada was birthed out of boilermaker, Babcock & Wilcox. The inventions of the company’s namesakes made them pre-eminent boiler suppliers of the 19th and 20th century. The more recent history of BWXT Canada has been no less a success but can be a bit harder to follow.

In 2015, BWXT Canada Ltd., formerly Babcock & Wilcox Canada Ltd., was rebranded after its parent company, BWX Technologies, Inc. (formerly known as The Babcock & Wilcox Company), spun off the fossil business, which kept the B&W moniker.
In addition to steam generator manufacturing, BWXT Canada and its Canadian affiliates also manufacture nuclear fuel, reactor inspection and maintenance tooling, feeders and other heavy nuclear components, including heat exchangers and nuclear storage containers. The company also offers an array of inspection and maintenance services for the components it supplies as well as other reactor services.

MacQuarrie may have called upon his fuel engineering background when, in late 2016, he oversaw the acquisition of GE-Hitachi Nuclear Energy Canada Inc. (GE Hitachi), now named BWXT Nuclear Energy Canada Inc. (BWXT NEC). It brings the capabilities of the two nuclear service and manufacturing powerhouses together. While the acquired business remains a subsidiary of BWXT Canada, the acquisition created an integrated organization with a lot of range and benefit for its customers, says MacQuarrie, who is now focused on offering increased value for BWXT's Canadian customers.

“We're moving to an integrated model so the customers have one team to deal with. We're adopting best practices from each of the companies and trying to utilize those across the entire business,” he says.

There have been a lot of moving parts in the last couple of years but effectively, since MacQuarrie became president in 2013, BWXT Canada Ltd. has shed its fossil roots and become an even more significant nuclear player, now with about 850 employees across five Ontario locations. In addition to its long-standing steam generator and component manufacturing and service capabilities, it adds BWXT NEC’s deep history and capability in the fuel end of the business. On a global scale, this works well for BWXT’s parent company, and at the same time it broadens the company’s scope on current Ontario project work.

The acquisition “is something that was very strategic for us,” says MacQuarrie. “BWXT is a leading supplier of nuclear components and fuel to the United States government … we like fuel and we like operating facilities that make fuel.

“The other part of the recently acquired business is the fuel handling business. That has a lot of synergy with our business in Canada because they do things that we don’t do in Cambridge. When you put those things together, they create greater value for our customers.”

In the past, BWXT and GE Hitachi had collaborated on bids for the nuclear refurbishment project work at Darlington. Now, as a single company, BWXT can offer a “more complete solution than we could separately,” MacQuarrie says.

“It's what most customers are looking for. They can get a full solution and all the protections that come with that, including a full warranty. As a customer you want simplicity and clarity when dealing with your supply chain.”

The personalities of the two companies seem well matched. Both the Cambridge and Peterborough facilities have demonstrated capabilities in delivering new technologies that have innovated nuclear operations; an important mindset for plant operators here as they try to get ahead of ideals set by the U.S. Nuclear Promise1.

The Peterborough facility is already showing its worth with the support they provided to OPG to achieve the ahead-of-schedule delivery of the Unit 2 defueling at Darlington in January. And, it just delivered the second Bruce Reactor Inspection Maintenance System (known as BRIMS II) to Bruce Power. These systems help shorten outages using remote inspection capability; something

---

**BWXT in Ontario’s nuclear projects**

**BWXT has a significant role in both the Darlington and Bruce Power mid-life projects**

**At Darlington:**

Darlington's current 16 BWXT-designed and built steam generators have been given a clean bill of health to operate post refurbishment. BWXT has held service contracts for the generators since Darlington was commissioned in the early 1990s. Now, it has been awarded contracts on Darlington's refurbishment which include steam generator modifications and maintenance.

Recently acquired BWXT NEC, also holds defuel and fuel handling hardware, software and services contracts with potential for further work as the refurbishment project and contracting progresses to the other three units.

BWXT Canada is contracted to provide manufacture and service for other components including the nuclear storage containers for materials removed from the reactor BWXT Canada is supplying the feeders for the refurbishment’s lead unit, out of its Cambridge facility.

**At Bruce Power:**

In June 2016 Bruce Power awarded BWXT a $130-million contract to replace eight steam generators as part of the operator’s major components replacement (MCR) project, which runs from 2020 – 2033.

There will be further potential opportunities for BWXT Canada to offer its new combined capabilities as Bruce Power continues its project planning and procurement.
that promises improved worker safety and improved maintenance schedules for nuclear operators.

Related:
Read BRIMSII announcement.
Read The CANDU Promise

While all of these developments are critical, in an increasingly competitive energy market, even the latest technology is not enough. Strong nuclear safety culture and human performance improvement programs have long been recognized as key contributors to success in the nuclear industry. MacQuarrie has been a strong promoter of suppliers as active participants in improve human performance across the industry and has worked with CANDU Owners Group to highlight some of the operator collaboration practices with the supplier community.

“There’s a lot of capability that has been developed and is now being brought to bear on human performance,” says MacQuarrie. “And we’re seeing collaboration amongst the contractors. Initiatives like the COG Supplier Participant (SP) program and its expansion has been very helpful. The focus we have with programs like human performance, looking at quality and having an awareness of counterfeit and fraudulent activities within the supply chain has been really beneficial. Suppliers are evolving to meet the needs of their customers and the refurbishments are providing a lot of opportunities for performance improvement.”

As suppliers and operators create a new framework for partnership, not only in business but also in the development of improved safety culture, human performance and technology innovation the table is set for the Canadian nuclear industry to have a long, healthy future.

**MacQuarrie on international opportunities**

While, the strongest market for domestic players is here in Canada, BWXT Canada does see a healthy export business as well. However, its president John MacQuarrie sees some challenges for Canadian suppliers hoping to expand, or even sustain, current business in foreign markets.

“There are good opportunities internationally. 2016 was our best year for international business. However, the issue is many of these markets like China and South Korea, are increasingly becoming less open… they’re increasingly developing capability so they can support themselves and they also want to export.”

And while there are new emerging markets, Canadian companies can also expect increasing competition from new players.

**MacQuarrie’s advice: “Find a niche and be competitive.”**

Nuclear suppliers are in demand… if they have the right stuff

**Suppliers can skill up to meet new expectations and gain opportunities through programs like COG’s Supplier Participant Program and other initiatives**

Ontario is the hub of Canada’s nuclear industry and currently, and in some respects, one of the most desirable markets for nuclear suppliers in North America today.

At the same time, it’s never been an easy road. It is an industry constantly under the microscope, with a history of market disruptions that serve as reminders of the need for continuous improvement in safety, reliability, affordability and community support. Today, suppliers play a bigger role than ever. And with that added opportunity comes a new level of accountability.

Following the dismantling of Ontario Hydro (OH), and its construction arm, Ontario’s nuclear industry went through a challenging recalibration period in project capability. OH’s successor companies, Ontario Power Generation (OPG) and Bruce Power, had to reframe their approach to large projects and with that came a need to rethink the relationship with suppliers.

The new model that has emerged includes greater partnership with large contracts for engineering, procurement and construction (EPC) as a single package, such as the $3.4 billion agreement joint venture SNC/Aecon struck with OPG for the Darlington refurbishment project.

Beyond the work captured in the SNC/Aecon agreement, there is much more; hundreds of millions in contracts for work to be
involved, it becomes a virtuous circle building more value for the participants.

“BWXT, with John’s support, has been a very active participant, attending all the SP meetings and presenting OPEX at every meeting. It’s clear that the BWXT representatives have John’s support and this has been instrumental in the success of the program,” Trotman says.

MacQuarrie says his company is always looking for ways to do things more efficiently and he views the COG program as a means to achieving that.

“With what we’re doing now, I would say COG has surpassed what I’ve seen in terms of collaboration in the U.S. market. And it’s still growing. I think it’s great. We’re trying to support it any way we can,” he says.

“I am really pleased with our engagement in COG these days – we’re getting more out of it than we ever did. The other thing COG’s done really well is bring the owners in… it’s a really good vehicle to bring them in. Without that engagement, suppliers wouldn’t get together as often as we do. I think it’s worked out really well. I’d like to see more suppliers join COG and see the program continue to expand.”

References
OPG (September 2016). Darlington Refurbishment Program Contracts, Schedule and Costs, EB-2016-0152: Untranscribed technical conference

The Canadian flag is displayed large and proud in BWXT Canada Ltd’s headquarter facility in Cambridge, Ontario. A century and a half ago the company’s predecessor got its start manufacturing boilers for fossil plants. Today the company manufactures a wide-range of products and provides many services for the nuclear industry.

Click to see more photos from the CANDU Owners Group tour of BWXT Cambridge plant