Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

CMD 23-M27.24

Date: 2023-08-03
File / dossier : 6.02.04
Edocs pdf : 7100762

Oral presentation

Written submission from the Nuclear Innovation Institute

Bruce Power

Bruce Power Mid-Term Update of Licensed Activities

Commission Meeting

September 20 and 21, 2023

Exposé oral

Mémoire de la Nuclear Innovation Institute

Bruce Power

Rapport de mi-parcours au sujet des activités autorisées de Bruce Power

Réunion de la Commission

Le 20 et 21 septembre 2023

Canada

August 3, 2023

Attention: *Canadian Nuclear Safety Commission (CNSC)*
RE: Mid-term update on licensed activities at the Bruce Nuclear Site

---

Overview

Benefits of Bruce Power's nuclear generating station are tangible and essential: providing 30% of Ontario's electricity, an emissions-free source of power, and job creation – not only in Bruce County but across the province. Bruce Power's Major Component Replacement project is not only a substantial investment into the future of the plant but also vital to Ontario's economic development.

But not all benefits are always direct or obvious. Ontario's long-term commitment to Bruce Power has allowed the creation of spinoff gains. One is the establishment of the Nuclear Innovation Institute (NII) by Bruce Power in 2020. NII is an independent, not-for-profit organization that provides a platform to accelerate innovation and the implementation of business-relevant solutions for the nuclear industry. NII is also a champion for opportunities that help students and adults embrace new knowledge and gain the tools they will need to make positive change in their communities and the world.

In doing so, NII has pulled together Founding Members from the major contributors to Ontario's nuclear supply chain: BWXT Canada Ltd., Cameco Corporation, E.S. Fox Ltd., Kinectrics Inc. and SNC-Lavalin. This is a unique group of private sector companies committed to collaboration, to economic growth and diversification and to improving social good.

This submission will focus on Bruce Power's role as a Founding Member of NII as well as its commitment to advancing programming and activities that benefit and support the communities (Indigenous and non-Indigenous) closest to the Bruce Power site and programming that highlights the broader provincial and national impact of nuclear power.

Industry projects: a focus on emerging technologies

NII's goal is to shape a Canadian nuclear industry that embraces new thinking, new technologies and new lines of business that can play a central role in the global shift to a low-carbon future.

NII's industry projects seek to advance innovation in the nuclear industry and related fields by bringing new expertise and technologies to solving real-world problems. A few NII projects at a glance:

- **Autonomous robotics** – Using Boston Dynamics' Spot robot with a laser scanner in a uranium mine, NII and partners explored how best to automate the process of using the laser scanner, reducing the time it takes to scan and process the data
- **Qualifying additive manufacturing** – Manufacturing and qualifying a nuclear-grade component (i.e., has specific nuclear requirements) using additive manufacturing/3D printing
- **Dose reduction via occupancy mapping** – A data science project using cameras and machine vision to track worker occupancy in a location as a means of producing a more accurate dose measurement

Community impact: education

NII Explore is a program dedicated to delivering enhanced educational opportunities for school-aged children to experiment, discover and create. The program has a primary focus on students in or near the Bruce, Grey and Huron regions – ensuring that students in rural schools have access to educational activities often only found in larger, urban regions. NII Explore has developed tools and curriculum that assist local educators with delivering coding programs and STEM (science, technology, engineering and mathematics) in their classrooms and staff are routinely used as a trusted resource for the local school boards in the region.

Most recently, the NII Explore team supported a summer camp organized by the Saugeen Ojibway Nation (SON) and brought their enthusiasm and engaging activities to add a fun and educational experience to the camp. For example, NII Explore demonstrated how pumped hydroelectric energy storage systems work using a marble run.

These are just a few examples of NII Explore's successes over the past 4 years. The program began during the depths of the COVID-19 pandemic by delivering online coding programming to ease some of the pressure on teachers and running a virtual summer camp when most in-person camps were closed. Since then, it has developed into a tremendous educational resource for students across the Bruce, Grey and Huron region.

Community impact: economic development

The Clean Energy Frontier program is an advocacy, awareness-raising and economic development initiative supported by Bruce Power and Bruce County and operating out of NII. The program focuses on demonstrating the valuable contributions that the clean energy sector in Bruce, Grey and Huron

make to Ontario and Canada in the drive toward a net-zero future, while also working to build on the region's advantages in clean energy.

The program builds on the success of supplier localization efforts by Bruce Power since 2016 to ensure that major companies in the Bruce Power supply chain were providing a direct economic benefit to the communities closest to the Bruce Power site. These efforts have seen tremendous results. In 2016, there were only 16 major suppliers in only three communities in the region (concentrated only in Bruce County). In 2023, there are more than 60 major suppliers operating in 14 communities across Bruce, Grey and Huron counties. This also includes Indigenous-owned businesses and partnerships like Makwa Development Corporation and Makwa-Cahill.

The Clean Energy Frontier builds on this significant advantage by demonstrating the impact of these operations not only to the region but to the rest of the province. For example, an economic impact study commissioned by the Clean Energy Frontier program found that the economic impact of Bruce Power's operations contributed approximately $4 billion to the province of Ontario's annual gross domestic product.

The program also engages regularly with local elected officials and municipal staff to support them in communicating about clean energy, nuclear power, net zero and other related topics. The program recently provided a plain-language toolkit to local elected officials to provide them with the key information needed to comfortably communicate about nuclear power in other forums. Furthermore, the program hosts an annual summit event that provides an opportunity for municipalities, local supply chain companies, and other key stakeholders to come together and discuss the challenges and opportunities facing the region.

Community impact: public policy

The Bruce Power Centre for New Nuclear & Net Zero Partnerships (the Centre) was created with the goal to advance the connection between the fundamental role of nuclear – both existing and new installations – and Canada's pledge to achieve net zero carbon emissions, demonstrating that there is no viable path to a net-zero future without nuclear power. The Centre strengthens this connection in several ways.

First, the Centre produces original research reports on the ways in which nuclear power can work with other sectors and technologies to achieve net zero emissions. In early 2022, the Centre released a report on how nuclear power combined with long-duration energy storage technologies can avoid emissions from natural gas peaking plants in Ontario. The Centre also serves a 'secretariat' function

for the Green Ribbon Panel – a cross-sectoral group of environmental and economic leaders from across Canada committed to creating a clean economy.

Furthermore, the Centre directly supports Bruce Power with its goal of becoming a net-zero site by the year 2027. Through the Centre, Bruce Power has partnered with ALUS – a farmer-led Canadian charitable organization – to advance 600 acres worth of projects to build nature-based climate solutions (tree planting, grassland development, etc.) on marginal farmland throughout Bruce and Grey counties. The three-year partnership will result in thousands of tons of additional carbon sequestered as well as habitat and ecosystem benefits across the 600 project acres. The project also brings two of the region's economic drivers – energy and agriculture – together in the fight against climate change.

Community impact: environment

Environment@NII provides a platform to advance leading research on ecosystem and the environment throughout the Bruce, Grey and Huron region and beyond. The program delivers actionable intelligence from leading-edge research focused on fostering a clean and healthy environment.

For example, researchers from the University of Waterloo are currently engaged in a study of Fairy Lake (a small inland lake in Southampton, ON) to determine why the quality of the lake was in decline. They found, among other findings, that coarse sediments from nearby storm drains were seeping into the lake and affecting water quality. These findings were then presented to the local municipality with recommendations for remediation activities.

This is but one example of the kind of research conducted through Environment@NII. With the support of Bruce Power, the program can continue to bring leading scientists and researchers to the Bruce, Grey, and Huron region to better understand our natural environment.

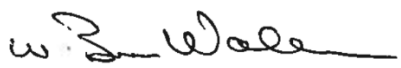
Conclusion

In only four short years, NII has made a big impact thanks to the dedication and support from our Founding Members. From STEM education to leading environmental research, economic development, advocacy, and innovative partnerships, NII is proud of the work programming that we deliver. We also know that none of this important programming would be possible without the support of Bruce Power.

As a Founding Member of NII, Bruce Power provided the visionary leadership needed to establish our organization. Furthermore, Bruce Power routinely supports NII programming and actively engages in program activities. Bruce Power's commitment to the region within which they operate, to the people that live there, and to the continued role of safe, clean and reliable nuclear power in meeting our climate targets is exemplary.

I am pleased to submit this written submission on behalf of the Nuclear Innovation Institute in support of Bruce Power and will look forward to expanding further during the CNSC's hearings in September 2023.

Sincerely,



Bruce Wallace | President & CEO
Nuclear Innovation Institute | bruce.wallace@nii.ca

NII COMPANY PROFILE

The Nuclear Innovation Institute (NII) is an independent, not-for-profit organization that provides a platform to accelerate innovation and the implementation of business relevant solutions for the nuclear industry. Incorporated in 2019, NII's goal is to shape a Canadian nuclear industry that embraces new thinking, new technologies and new lines of business that can drive the global shift to a low-carbon future. NII is also a champion for opportunities that help students and adults embrace new knowledge and gain the tools they will need to make positive change in their communities and the world. As a member-based not-for-profit, NII is accountable to its members through a Board of Directors.
