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Exposé oral

**Written submission from
SNC-Lavalin**

**Mémoire de
SNC-Lavalin**

Bruce Power

Bruce Power

**Bruce Power Mid-Term Update of
Licensed Activities**

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

Commission Meeting

Réunion de la Commission

September 20 and 21, 2023

Le 20 et 21 septembre 2023

August 3, 2023

SNC-Lavalin Representation Regarding

Ref: 2023-M-27 – Bruce Power mid-term update on licensed activities and the Bruce Nuclear Site

1. INTRODUCTION

This document constitutes SNC-Lavalin's written submission to the Canadian Nuclear Safety Commission in support of the mid-term update of Bruce Power's Power Reactor Operating Licence (PROL) for the Bruce Nuclear Site.

In this document, some information will be summarized as follows:

- CANDU® reactor safety
- SNC-Lavalin's relationship with the Bruce site and Bruce Power
- SNC-Lavalin's perspective on Bruce Power as a good community member
- SNC-Lavalin's experience working with Bruce Power, and
- SNC-Lavalin's summary evaluation of Bruce Power's performance as a licenced operator.

2. BACKGROUND

CANDU reactor technology, exclusively licensed to Candu Energy Inc., a member of the SNC-Lavalin Group, has over 50 years of safe and reliable operating experience. Heavy water moderated reactors based on the CANDU design are in operation or under refurbishment in seven countries worldwide.

The CANDU design is proven, with high reliability and an excellent safety record. Over the years, the CANDU design has evolved to further improve safety and performance, while maintaining the fundamental safety features of CANDU technology.

The eight CANDU reactors that comprise the Bruce Nuclear Generating Stations (NGS) A and B have functioned safely, without major incident to the workers at the facility, the surrounding communities, or the environment at large, for over four decades.

Bruce Power's impressive safety record is representative of a long history of CANDU technology performance in Ontario and around the world. CANDU reactors have provided electricity to the residents of Ontario since 1962, initially through the Nuclear Power Demonstration nuclear generating station, a demonstration-scale CANDU nuclear power plant. In total, 22 full-scale CANDU reactors have been constructed in Canada, 20 of them in Ontario alone, and nine others— all with a similar record of safety.

This represents a safety record spanning approximately 900 combined CANDU reactor-years of operation worldwide, an enviable track record when compared to other energy sources.

3. SNC-Lavalin's relationship with the Bruce Site and Bruce Power

SNC-Lavalin played a pioneering role in developing the commercial nuclear industry in Canada in the 1960s, and has become the world's top provider of refurbishment expertise for CANDU reactors. We oversee new-build nuclear power plants, major refurbishments, and life extensions, and offer specialized services in safety analysis, environmental qualification, metrology/spatial analysis, geotechnical investigations, decommissioning and waste management services.

SNC-Lavalin has been engaged with the Bruce Nuclear Site since its creation. Our predecessor organization (AECL-CANDU, the commercial arm of AECL) was the primary design partner (with Ontario Hydro) for the units currently operated by Bruce Power. SNC-Lavalin maintains a design office in Port Elgin, and has staff located at the Shoreline site in Kincardine. SNC-Lavalin also participates in and contributes to various Bruce community events and initiatives, typically in partnership with Bruce Power. SNC-Lavalin is part of the Bruce community.

SNC-Lavalin has been a strategic partner with Bruce Power since its inception, primarily providing engineering design plus emergent and planned outage support. Commercially, we have remained an independent entity with considerable experience working with multiple reactor operators worldwide. This gives us a particular perspective on Bruce Power's operation and the Bruce site. Below is a representative list of recent projects conducted for Bruce Power.

- Fuel channel inspection and maintenance campaigns
- Calandria tube / LISS nozzle gap inspections
- Steam generator cleaning
- Major Component Replacements (MCR) project
- Various engineering service type of projects for various engineering systems including conceptual, preliminary, and detailed designs, Design Change Package (DCP), and Design Change Notice (DCN) for multi-disciplinary engineering

4 Bruce Power's Community Benefits

4.1 Bruce Power's Benefits to the Local Community

Through our long relationship, SNC-Lavalin has observed that Bruce Power and its employees are important and valued members of the local community.

Bruce Power brings substantial employment benefits to the community, providing secure, high-value jobs with good career prospects. It is a significant employer of highly talented and educated people, providing immense stability to the community. Further, Bruce Power strongly encourages its suppliers to locate staff and facilities near the Bruce site, multiplying the community benefits beyond the direct employee base of Bruce Power. Bruce Power, along with SNC-Lavalin and others, were founding partners in the 2019 creation of the Nuclear Innovation Institute, a not-for-profit research institute located in Port Elgin that brings further benefits and future vision to the community.

Bruce Power works actively with SNC-Lavalin, its partners, the Organization of Canadian Nuclear Industries, and Bruce Power's Indigenous Relations Supplier Network to develop Indigenous Inclusion Opportunities for nuclear generation projects. Key principles behind this strategy include promoting direct hires, contracts and subcontracts, training initiatives, and community events involving the Indigenous community. SNC-Lavalin has a solid reputation and track record of engaging and partnering with Indigenous communities in a fair and inclusive way, and views Bruce Power as a well-engaged company with a reputation we support.

In addition to their work with Indigenous communities and their environmental policy, Bruce Power maintains an active community involvement program, donating to community organizations and events. It actively participates through what it believes is its social responsibility to engage, assist and champion the needs and causes close to home, with the intent to support the great work that is being done to improve lives, protect the environment, celebrate culture, encourage education and build healthy communities in Bruce, Grey and Huron counties. Bruce Power actively encourages its suppliers to participate and contribute to many of these worthy causes. SNC-Lavalin is happy to do so, and will continue to support Bruce Power initiatives.

4.2 Bruce Power's Benefits to the Global Community

Bruce Power provides benefits to communities beyond its local region.

- Electricity is a key energy source enabling a high standard of living in Ontario, and Bruce Power produces approximately 30% of that power.
- The elimination of coal-fired electricity generation in Ontario was enabled by nuclear-power generation, and has provided large environmental and health benefits to communities far distant from the Bruce Site.
- In 2022 Bruce Power announced its commitment to achieve net-zero greenhouse gas emissions by 2027. This is admirable and consistent with SNC Lavalin's own vision and beliefs on how we need to take responsibility for reducing climate change.
- Bruce Power's projects to produce radioisotopes help provide vital resources to the medical community. In the last five years Bruce Power has begun supplying Cobalt-60 and Lutetium-177, and is investigating other isotopes. These initiatives extend the benefits of its nuclear reactors beyond electricity production.

5. SNC-Lavalin's experience working with Bruce Power

SNC-Lavalin and Bruce Power have developed a strong working relationship over many decades during the various stages of the plant lifecycle, including the original design, operation and maintenance. This work has ranged from engineering support for design changes, fitness-for-service assessments, support for equipment reliability and ageing management programs, support of inspection and maintenance activities and supply of replacement parts to collaboration on Lessons Learned from Fukushima and on the development of products to support the continued safe and reliable operation of the Bruce units. During the current licence period, the SNC-Lavalin and Bruce Power relationship has grown even stronger through our support for the Major Component Replacement (MCR) projects, and for the operation of the Bruce units.

During the last five years Bruce Power has continued to demonstrate the characteristics of a mature, capable nuclear operator and licensee. Addressing specifically the MCR projects, SNC-Lavalin and its staff have observed an organization that:

- Takes strong ownership of the station;
- Puts safety first;
- Demands technical excellence from its suppliers and partners;
- Clearly strives for excellence in safety, environmental and economic performance;
- Maintains an open attitude to improvements and a willingness to invest in new technologies and methodologies;
- Is open to challenging itself and its suppliers when appropriate;
- Reaches out to other stations to resolve issues and offer solutions; and
- Collaborates with the broader nuclear community to improve knowledge and performance.

While the MCR project has faced challenges, these are to be expected as part of a major refurbishment project. Good progress has been made, with Unit 6 returning to service and Unit 3 starting refurbishment this year. SNC-Lavalin is confident that the experience gained on Unit 6 will lead to increased efficiency in the refurbishment of the remaining units, as has already been demonstrated at the Darlington site.

As a supplier, SNC-Lavalin considers Bruce Power to be both a respected partner and challenging client. These are mutually supportive characteristics, and in SNC-Lavalin's opinion they demonstrate Bruce Power's maturity.

6. Summary

SNC-Lavalin has been engaged with Bruce Power since its creation, providing station maintenance and life-extension services. Throughout this time SNC-Lavalin has found that Bruce Power and its staff take strong ownership of the station. They demand technical excellence from their suppliers and partners, and clearly strive for excellence in safety, environmental and economic performance. They demonstrate an open attitude to improvements, and a willingness to invest in new technologies and methodologies. Their commitment to achieving net-zero greenhouse gas emissions by 2027 is admirable and consistent with SNC Lavalin's own vision and beliefs. Their projects to produce radioisotopes such as Cobalt-60 and Lutetium-177 extend the benefits of their nuclear reactors beyond electricity production into medical care. Their Major Component Replacement (MCR) project will soon return Unit 6 to service, and we are confident that the experience gained will lead to increased efficiency in the refurbishment of their remaining units. Bruce Power brings economic and social benefits to the community, and actively encourages its suppliers to do so as well. SNC-Lavalin is proud to be a partner with Bruce Power, and intends to continue to offer its full range of capabilities to support the continued safe and reliable operation of the Bruce site.

In conclusion, SNC-Lavalin believes that Bruce Power has demonstrate that it is a capable, safe operator of the Bruce site that makes positive contributions to its local community, Ontario and beyond Ontario. In our opinion, during the last five years Bruce Power and its staff have demonstrated the attitudes and practices required of a nuclear licensee.