

**CNSC Public Hearing for the Bruce Power Renewal
May 30, 2018
Towne Place Suites Marriott, Highland Conference Room
19 Millenium Way, Kincardine N2Z 0B5**

For the record, my name is Fred Dermarkar, and I am the President and CEO of the CANDU Owners Group.

Thank you, President Binder and Members of the Commission for giving the CANDU Owners Group, or COG as we are often called, the opportunity to present our thoughts on Bruce Power's request for a 10-year license renewal.

COG is a private not-for-profit corporation dedicated to CANDU excellence through collaboration. It achieves through sharing operating experience, research and development, joint projects and providing training. I do not intend to repeat what I have already submitted in the letter of support, but rather to complement or elaborate upon its content.

To start off, I would like to reflect upon the seventh review meeting of the Convention on Nuclear Safety.

This meeting, which was hosted by the International Atomic Energy Agency, and chaired by Ramzi Jammal as President for the convention, creates a forum for 80 countries to convene every three years and report on their nuclear safety programs.

At this meeting, the international community cited Canada, and COG in particular, with good performance through its facilitation of an international weekly screening meeting to review low level events. The screening committee is composed of all the COG utility members and some suppliers to the CANDU community.

Its objective is to identify actions for further follow up by utilities to prevent their recurrence in other plants. Bruce Power staff participate regularly and actively at this meeting, both sharing their experience, and learning from others.

Although it is not uncommon for industries to learn from high profile events, this meeting is significant because it provides a forum for discussion of lower-significance issues that plants face on a more day-to-day basis. Close to 800 items are discussed each year.

Discussion like this can significantly accelerate the pace of continuous improvement, particularly with respect to nuclear safety and plant performance. As an active participant in this program, Bruce Power both contributes to, and directly benefits from, this accelerated improvement.

In addition to the sharing of operating experience through the weekly screening meetings, COG hosts close to two-hundred events each year where it brings the industry together. These events vary from small group meetings to large international workshops.

As a core member of COG, Bruce Power participates in almost all of these events. This gives many of its staff the opportunity to engage and network with its domestic and international counterparts in many diverse areas of operation.

The end result is that Bruce Power helps the CANDU community, domestically and internationally, learn from its extensive experience that comes from operating a fleet of 8 reactors. In return, Bruce Power also learns from the experience of the other utilities operating 39 other CANDU and PHWR reactors worldwide.

This extensive sharing of experience helps to explain why plants are improving performance as they age. To answer an earlier question from the Commission regarding what would be a good analogy to improved performance with age, the analogy I would offer is wisdom: through learning, we grow in wisdom as we age.

Another item I would like to highlight is the leadership role that Bruce Power plays in COG's R&D programs, both in terms of setting direction for these programs, as well as funding them.

Together, COG's members invest over \$60M annually in R&D and project activities in six areas of research to advance the technology to strengthen safety performance, reliability and affordability to the benefit of society.

To put this amount in context, it is in line with the spending of the Top 15, or so, private sector research investors in Canada.

One of these program areas is Fuel Channels, which form the primary pressure boundary for a CANDU reactor. It is vital for operators to have a high degree of confidence in the continued integrity of fuel channels as they age under the effects of temperature, pressure, and neutron flux.

Together with its Canadian utility partners and CNL, Bruce Power has directed the Fuel Channel R&D program and associated Joint Projects to improve confidence in the fitness-for-service of CANDU pressure tubes and to develop industry standards used worldwide to confirm pressure tube integrity. This work includes accelerated aging of components removed from service and then tested to confirm material properties.

As a result, this program has not only increased understanding of fuel channel material properties, it has provided experimental evidence to improve risk-informed decision making using probabilistic methods and to create predictive models demonstrating fitness for service up to 300,000 equivalent full-power hours.

Bruce Power's leadership role in COG's R&D program goes beyond Fuel Channels.

Amongst COG's six R&D program areas is a program dedicated to health, safety and the environment. Research from this program directly addresses the interest of some Bruce Power communities, including the First Nations and Indigenous communities.

I would like to take a moment to provide you examples of the types of environmentally-focused R&D that Bruce Power is directing and supporting through its participation in COG.

One series of projects is looking at how naturally occurring tritium diffuses and distributes in the environment, and why it concentrates in some areas more than in others. Releases of tritium from Canadian NPPs today are small and far below regulatory standards or World Health Organization guideline levels. However, in nuclear, we strive for continuous improvement in environmental performance. Understanding the factors that drive variations in background tritium will help us to better understand the incremental contribution of tritium from NPPs.

Another series of projects is looking at the impact of very low doses of tritium on living organisms. One more series of projects has studied the impact on fish impingement and entrainment. These projects were used to initiate a Canadian Standard, CSA N288.9, to provide guidance on fish impingement and entrainment. This standard is in the process of being published.

A third area of research in which Bruce Power is playing a leadership role relates to Nuclear Safety and Licensing, an area where COG and its members have made outstanding contributions to enhance nuclear safety both domestically and internationally.

Starting prior to the events at Fukushima, a significant amount of work had already been done through COG to better understand severe accidents. This work continued following Fukushima, and continues today.

The results of this work have been used to develop components, such as passive autocatalytic recombiners, to mitigate the consequences of severe accidents. It is also being used to enhance codes used to analyze severe accidents, as well as to develop and enhance severe accident management guidelines used by operators.

On the subject of codes, another of the R&D program areas concerns the Industry Standard Toolset. This program is a consolidation of the maintenance and support, development and qualification activities on the different computer codes used for design, safety analysis and support of CANDU reactors.

To conclude, Bruce Power is a leader in continuous improvement, innovation through R&D, environmental protection and nuclear safety.

Through its contributions to the nuclear industry, Bruce Power is advancing health care, is helping Canada to achieve its goals for climate change and helps us provide safe, reliable and affordable electricity with nuclear technology.

Ultimately, it is helping to improve the quality of life for all Canadians, and should be granted a 10-year license.