Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

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Oral Presentation

Submission from CANDU Owners Group Inc.

In the Matter of

Ontario Power Generation Inc., Pickering Nuclear Generating Station

Request for a ten-year renewal of its Nuclear Power Reactor Operating Licence for the Pickering Nuclear Generating Station

Commission Public Hearing – Part 2

June 2018

Exposé oral

Mémoire de CANDU Owners Group Inc.

À l'égard de

Ontario Power Generation Inc., centrale nucléaire de Pickering

Demande de renouvellement, pour une période de dix ans, de son permis d'exploitation d'un réacteur nucléaire de puissance à la centrale nucléaire de Pickering

Audience publique de la Commission – Partie 2

Juin 2018

Canada

CANDU Owners Group Inc.

"Excellence Through Collaboration"

May 1, 2018

Canadian Nuclear Safety Commission
Secretariat
c/o Louise Levert
Canadian Nuclear Safety Commission
280 Slater Street, P. 0. Box 1046
Ottawa, ON K1 P 5S9

Email: cnsc.interventions.ccsn@canada.ca

Subject: Ontario Power Generation Licence Renewal {Ref. 2018-H-03}

Dear Ms. Levert,

I am writing on behalf of the CANDU Owners Group (COG) in support of Ontario Power Generation's application to renew its Pickering Nuclear Generating Station (PNGS) licence for a 10-year period. I also wish to indicate my interest in attending the hearing in June 2018 to provide an oral presentation. My presentation will elaborate on the points below.

The benefit of continued operation of Pickering Nuclear
The continued safe operation and life extension of the Pickering six-unit station until the end of 2024 will contribute significantly to Ontario's sustainability and prosperity through:

- The additional low-carbon electricity it will produce for Ontario during that period;
- Thousands of person hours of employment and economic benefits it will create;
- Continued opportunity for innovation and career development of the next generation of nuclear workers;
- The continued supply of medical isotopes; and
- As an enabler for the synchronization of the OPG Darlington and Bruce Power refurbishment/major component replacement (MCR) projects.

In addition, OPG's Pickering station is a significant contributor to the strength of the CANDU industry through its leadership in collaborative efforts, including through COG.

Nuclear operator collaboration through the CANDU Owners Group
Through my presentation to the Commission, I will address OPG's efforts to maximize the benefits mentioned above through continuous improvement in Pickering Nuclear's performance. These results have been achieved through research, development and collaborative learning on operations, maintenance and engineering activities to achieve increasingly consistent and strong safety, reliability and environmental results at PNGS. In particular, I will speak to those efforts undertaken through COG.

The CANDU Owners Group (COG) is a not-for-profit organization with membership from all CANDU operators both in Canada and internationally. Our mission is "to improve performance of CANDU stations worldwide through member collaboration" with a vision to create excellence.

To fulfill this mission and vision, COG is organized around four operational program areas:

- Nuclear and Environmental Safety
- Research and Development
- Information Exchange
- Joint Projects

In addition, COG has developed a leadership and knowledge management training program to strengthen leadership and management skills amongst high-potential technical managers in the nuclear industry.

COG members spend approximately $60 million a year in R&D and joint projects to strengthen the safety, reliability, environmental and cost performance of the CANDU nuclear plants. This investment by our members is in line with a Canadian Top 15 private-sector company's R&D investment. Investment into R&D is made by our members in proportion to the number of operating units, which makes OPG, with its Pickering and Darlington stations, the largest current contributor to COG's R&D program. This, in turn, benefits the entire CANDU community, both domestically and internationally.

The work facilitated by COG on behalf of its members, relies upon capable, knowledgeable suppliers, with deep expertise, human capacity and facilities to undertake ground-breaking nuclear science. This research, and the associated engineering activity, is undertaken mostly in Canada at organizations like Canadian Nuclear Laboratories, Kinectrics, SNC Lavalin and Stern Laboratories.

The discoveries developed in Canadian laboratories on behalf of Pickering Nuclear and other CANDU operators have resulted in countless improvements in plant safety, reliability, cost and environmental performance. As a result of the operators on-going commitment, Canada's nuclear plants are achieving better results than at any other time in their history, even as they age. Certainly this has proven true for Pickering, which has demonstrated some of its best performance in recent years and has earned strong safety results in CNSC annual evaluations.

Emergency Management and Severe Accident Response
Through joint initiatives, the members have developed industry-leading best practices in emergency management and severe accident response. It was OPG who led the international effort following events at Fukushima to introduce and implement new standards of preparedness. This included an investment of millions of dollars, new processes and initiatives in partnership with external agencies and significant collaboration amongst the operators. This collaboration continues today through a COG peer group and associated research.

Continuous Improvement through Research and Collaboration
Some of the research achieved by our members and suppliers through COG that has directly contributed to improved performance at Pickering Nuclear includes:

- **Fuel Channels:** The Fuel Channel (FC) research and life management programs are primarily focussed on addressing the current operational need to improve confidence in the fitness-for-service of CANDU pressure tubes and developing industry standards for pressure tube integrity. Under normal operating conditions, the pressure tubes are exposed to high

temperature, pressure, and neutron flux. The resultant changes in material properties as the pressure tubes age need to be assessed to confirm the pressure tubes remain fit-for-service.

The fuel channel research undertaken through COG has given us increased understanding of the material properties, improved risk-informed decision-making from a probabilistic approach, and provided opportunities to manage the effects of service. Through extensive research, OPG and its project partners have created or improved predictive models that are required in order to demonstrate fitness for service up to at least 295,000 equivalent full-power hours.

Safety and Licensing (S&L): The S&L Program addresses issues relating to the safety design basis and safe operating envelope of existing nuclear plants, and has a strong focus on supporting the resolution of outstanding generic safety and licensing issues. For example, as a follow-up to the events at Fukushima, some of the R&D recently completed or underway seeks to confirm understanding of severe accident phenomena. There is also an increasing focus on plant aging and asset management as well as operational issues. For Pickering, this work has meant improved understanding of safety margins.

- **Health, Safety and Environment (HS&E):** The HS&E Program addresses issues related to worker health and safety – primarily providing solutions to mitigate risks of radiation exposure through radiation monitoring and dosimetry; and to mitigate environmental risk – identifying and monitoring emissions of concern (both radioactive and conventional), predicting risk to both human and non-human biota and implementing appropriate environmental monitoring.

  Research that directly addresses the interest of Pickering communities, including the First Nations and Métis communities, includes studies on fish entrainment and impingement, studies relating to the behaviour of tritium in the environment, as well as efforts to benchmark and improve waste management practices in the operating stations.

- **Chemistry, Materials & Components:** This program covers a diverse range of issues that can impact on the safe, reliable and efficient operation of the major CANDU systems and their auxiliaries, such as the Primary Heat Transport, Moderator, Steam Generators, Emergency Core Cooling and Containment. This includes optimizing the chemistry control regimes and understanding material aging effects in order to predict, manage and mitigate degradation of key components, such as feeders and steam generators, and thereby extend the life of these assets. There is also a strong focus on smaller components such as valves, cables, sealants, lubricants and other organically-based materials.
- **Industry Standard Toolset:** The Industry Standard Toolset (IST) Program is a consolidation of the qualification, development and maintenance activities on different computer codes used for the design, safety analysis and operational support of CANDU reactors.

All COG members also participate in COG's OPEX (Operating Experience) sharing. This includes learnings from events that have occurred at CANDU and non-CANDU plants, best practices and just-in-time briefings, as well as questions posed to, and answered by, COG members. There are currently almost 43,000 items of operating experience in the shared databank that employees of COG members can access at any time; approximately 800 new items are added to this databank every year.

As well, more than 100 events annually allow our members to work in collaboration with others on everything from obsolescence management and improved maintenance techniques to emergency preparedness and cyber security.

An Engaged Supply Chain

The commitment to collaborative exchanges does not end with the operators. The Canadian nuclear supply chain community is deeply involved in COG as well with about 20 suppliers including SNC-Lavalin, BWXT, Kinectrics and Hatch participating in the ***COG Supplier Participant program***. Together, they are leading initiatives to improve knowledge right through the supply chain to the smallest suppliers on topics including workplace safety and security, human performance and safety culture.

In short, through the commitment of COG members and supplier participants, a vital network of information sharing, research and development is contributing to excellence in human and plant performance. Together, we are continuously improving safety, reliability, affordability and environmental outcomes in Canada's nuclear plants. Ontario Power Generation is a leader in these efforts.

I look forward to elaborating on aspects of this letter during my presentation in June.

Sincerely,

Fred Dermarkar, P. Eng.
President and CEO

FD:bb