



**Written submission from
Nordion (Canada) Inc.**

**Mémoire de
Nordion (Canada) Inc.**

In the Matter of

À l'égard d'

Ontario Power Generation

Ontario Power Generation

Ontario Power Generation – Licence amendment application for the Darlington Nuclear Generating Station regarding the commercial production of Cobalt-60

Ontario Power Generation – Demande concernant la modification de son permis pour la centrale nucléaire de Darlington en vue de produire commercialement du Cobalt-60

Public Hearing – Hearing in writing based on written submissions

Audience publique – Audience fondée sur des mémoires

Spring 2024

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Intervention for Ontario Power Generation's License Amendment Application for The Darlington Nuclear
Generating Station Regarding the Commercial Production of Cobalt-60

April 5, 2024

This written intervention is on behalf of Nordion (Canada) Inc., a Sotera Health company based in Ottawa. Nordion fully supports Darlington's requested amendment application to begin production of Cobalt-60. Cobalt-60 is a critical isotope to the health care sector and Darlington is in a position to provide this isotope in a manner that protects people and the environment. Nordion is the leading global provider of Cobalt-60 and is in a unique position to provide insight into the Cobalt-60 industry and supply chain and speak to the importance of Cobalt-60 production at Darlington.

Ontario Power Generation (OPG) has been safely supplying Cobalt-60 to Nordion since 1971, and in 2019 entered into an agreement with Nordion for future production of Cobalt-60 at the Darlington Nuclear Generating Station (Darlington). Darlington's proposed license amendment will support that agreement. Nordion obtains our Cobalt-60 from a variety of sources, through collaborations with OPG and other nuclear power operators. These partnerships are essential to our ability to deliver Cobalt-60 sources to our customers for the sterilization of single-use medical devices, the irradiation of food and spices, and the delivery of cancer treatment. Our partnership with OPG allows us to contribute every day to the health and wellbeing of millions of people in Ontario, Canada and around the world.

Cobalt-60 is a critical component of the healthcare supply chain. It is used to sterilize more than 30% of all single-use medical devices globally, and more than 40% in the U.S., accounting for roughly 16 billion devices annually. In fact, some products can only be sterilized with Cobalt-60, due to their design or materials. Products sterilized with Cobalt-60 are used in a wide variety of medical procedures, including orthopedic surgery, cardiovascular procedures, and invasive diagnostic procedures (e.g. endoscopy, biopsy). Cobalt-60 was also widely employed in the COVID vaccine supply chain for the sterilization of both vaccine-related

products, such as vial stoppers and closures, and single-use technology bioprocessing equipment, used in vaccine research development and manufacturing processes.

Sterilization with Cobalt-60, known as “gamma processing,” is a simple, safe, reliable, and cost-effective method with a history of over 70 years. OPG’s existing expertise on how to produce, package, transport, manage, and store Cobalt-60 is indispensable and cannot be easily replicated at other locations. Canadian sources of Cobalt-60, including those produced at OPG, supply more than 50 per cent of the world’s Cobalt-60. As you can imagine, this Canadian technology has had and continues to have a profound positive impact on the lives of millions of patients around the world.

Although alternative technologies for medical device sterilization exist, they each have drawbacks that make them less appealing than gamma. More importantly, switching between technologies is burdensome and costly for the medical device manufacturer, and could take many years to implement due to stringent regulatory requirements. As such, if there was a sudden reduction in the availability of Cobalt-60, much of the healthcare infrastructure we have come to rely on would be put at risk.

Cobalt-60 is mostly known for its use in gamma sterilization, but it also plays a vital role in cancer treatment. Stereotactic radiosurgery technology is used to deliver strong beams of radiation towards a specific coordinate, targeting a tumour or other abnormality in the body while minimizing impact on healthy tissue. Nordion’s partner Elekta, for example, created the Gamma Knife[®], which provides a non-invasive treatment for brain cancers and other brain diseases. There are approximately 700 Gamma Knife and similar machines worldwide, including 6 in Canada, which deliver treatment to more than 30,000 patients a year. We are also partners with a company called Xcision, whose device the GammaPod™ is the world’s first stereotactic radiotherapy system optimized for treating breast cancer. Approval of the Darlington Nuclear Generating Station would help support medical innovation in our collective fight against cancer.

As a company, one of our major goals is increasing Cobalt-60 supply to keep up with global demand, which has been steadily growing at a rate of 5% per year. There are a limited number of reactors around the world that can produce Cobalt-60, and the development of new sources of Cobalt-60 production takes many years, is capital intensive, and can involve foreign governments and reactor operators whose commercial and operational philosophies are not as well aligned as those of a Canadian operator. This is why maintaining and increasing Cobalt-60 supply in Canada is a priority. It allows us to take advantage of the top-of-the-line gamma expertise developed in Canada over the last 70 years, as well as OPG's existing expertise on Cobalt-60 production, management, and transportation.

It is important to point out that CANDU reactors are uniquely suited to producing Cobalt-60 at a large scale and at the specific activity required by the gamma sterilization industry. Although other reactor types can and do produce Cobalt-60, and technology is being developed to expand production even further, none of these sources will be able to match Canada's ability to grow the supply of this critical isotope.

Additionally, keeping Cobalt-60 supply local reduces transportation emissions, aligning with our combined goal of reducing greenhouse gas emissions. Having a partner like OPG who is geographically close to our production facility and can produce Cobalt-60 in multiple units drives efficiencies that could be found in few other places. The transportation of radioactive material is, as you can imagine, costly and complex. Obtaining resources from a Canadian reactor that operates under the same world class regulatory regime as us provides confidence in safety and security, as evidenced by OPG's impeccable transportation record.

Finally, extending OPG's license to produce Cobalt-60 at their Darlington location also minimizes our reliance on foreign providers such as Russia to fulfill demand. Due to recent global events, the Russian Cobalt-60 supply chain has become more prone to geopolitical risks, making it within Canada's best interests to invest in the Canadian Cobalt-60 supply chain to ensure continued supply volume.

Today, Cobalt-60 from OPG is processed by Nordion into sealed sources at our facility in Ottawa and then shipped to more than 120 gamma processing facilities in over 40 countries around the world. Our business directly supports more than 150 highly skilled employees including scientists, engineers, and technicians in Ontario. OPG and its host of CANDU reactors is critical to maintaining this unique set of capabilities and positioning Canada as a global leader in the gamma processing industry.