



**Written submission from the
Canadian Nuclear Association**

**Mémoire de
l'Association nucléaire canadienne**

In the Matter of

À l'égard de

**Application to allow the production of
lutetium-177(Lu-177) at the Bruce Nuclear
Generating Station (NGS)**

**Demande de modification de permis visant à
permettre la production de lutécium 177 à la
centrale nucléaire de Bruce**

Public Hearing - Hearing in writing based on
written submissions

Audience Publique - Audience fondée sur des
mémoires

June 2021

Juin 2021

May 27, 2021

Canadian Nuclear Safety Commission
c/o Louise Levert, Secretariat
280 Slater St. PO Box 1046
Ottawa, Ontario K1P 5S9

Subject: Canadian Nuclear Association intervention in support of Bruce Power's application for a licence amendment to allow the production of lutetium-177 at the Bruce Nuclear Generating Station.

The Canadian Nuclear Association (CNA) has over 120 members representing over 76,000 Canadians employed directly or indirectly in generating clean electricity, researching and producing nuclear medicine, exploring and mining uranium and promoting Canada's worldwide leadership in science and technology innovation. Our members are committed to safety throughout the entire life-cycle of the nuclear industry and as such are supportive of Bruce Power's application to produce lutetium-177 (Lu-177).

Every year in Canada, nuclear technology helps avoid 80 million tonnes of carbon dioxide emissions by displacing fossil fuels, supplies 70% of the global supply of cobalt-60 radioisotopes that are used to treat cancer and sterilize medical equipment, as well as supplying other life saving medical isotopes. Bruce Power is a critical part of this important industry and the production of Lu-177 is another contribution to the increasingly important role nuclear medicine plays in the health of Canadians.

It is widely acknowledged that the demand for medical isotopes will increase substantially in the next decade thereby increasing the need for additional irradiation capacity. The design and operating characteristics of CANDU reactors allow access to high neutron zones of the reactor and therefore creates the opportunity for loading and unloading targets while the reactor is producing power. This creates an important opportunity for Canada to strengthen its long-term supply of isotopes and to enable more life-saving medical treatments.

The proposed Isotope Production System (IPS) that Bruce Power and its partner IsoGen are developing will be a game changer in the globally medical isotope supply chain by dramatically increasing the production capacity of some medical isotopes by capitalizing on the existing Bruce Power infrastructure.

The IPS will first be used to produce Lu-177 which is currently used to treat neuroendocrine tumors and has additional applications for prostate and breast cancer treatments.



Lu-177 has unique properties which enable it to be used for imaging as well as the therapeutic treatment of tumors. Lutetium-177 has the potential to save thousands of lives making Bruce Power's ability to mass produce it a critical contribution to health care.

Once fully operational the IPS will have the ability to produce a wide variety of medical isotopes, not only opening the door to large-scale research and development in Canada but enabling medical professionals to improve lives through targeted imaging and therapy that can deliver a specific medical diagnosis and treatment to each individual patient.

To assist with Bruce Power's increased activity in the medical isotope field, Bruce Power launched a Medical Isotope Advisory Panel in June 2020. The panel is made up of experts and medical professionals across Canada and is intended to provide the company with insights into emerging trends in the use of medical isotopes and how Bruce Power can best contribute.

The CNA would like to note the involvement of the Saugeen Ojibway Nation (SON). SON and Bruce Power have entered into an agreement to jointly market new isotopes and to work together to develop new economic opportunities within the SON territory by establishing isotope infrastructure. This partnership is an important first step in creating an enhanced relationship that will create mutually shared benefits.

The CNA believes that past performance is the best indicator of future performance and over the past 20 years Bruce Power has demonstrated its ability to run its reactors safely with no harm to workers, the public or the environment. The isotope project will follow Bruce Power's number one value of Safety First.

A mock up facility has been created to evaluate the safety and efficiency of the IPS design to minimize potential risk to workers. In addition, radiation protection principles (ALARA) are being used during the design phase to further protect workers. One example is determining locations of reduce background radiation dose for equipment installation. Another is the incorporation of shielding into the design to minimize dose.

The Planned IPS has been reviewed and is not expected to have an impact on the environment. In the unlikely event of a failure and the creation of active products, emissions would go to the exhaust stack and be captured by the high-efficient particulate air filters. It is also important to note that the IPS is not expected to produce any additional nuclear waste.

In the process of preparing this licence application Bruce Power conducted a Performance Review which assessed each of the CNSC Safety and Control areas. The Performance Review demonstrated that Bruce Power is fully qualified to conduct licensed activities and that Bruce Power can safely implement the IPS.

For these reasons the CNA is pleased to support Bruce Power's application for a licence amendment to allow the production of lutetium-177 at the Bruce Nuclear Generating Station.

If you have questions or require additional information, please contact Steve Coupland, Director of Regulatory and Environmental Affairs at couplands@cna.ca

Sincerely



John Gorman
President and CEO
Canadian Nuclear Association