



## Ensuring Long-term Cobalt Supply for Industry Sustainability and Growth

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For the past 50 years Nordion, a leader in the gamma irradiation industry, has provided a safe and reliable supply of cobalt to our customers. Over the past decade Nordion has diversified and enhanced our supply chain and expanded our regulatory, logistics, design and engineering capabilities to better serve our customers. In addition to this technical expertise, we also have a dedicated team focused on sustaining and expanding existing supplier relationships and developing new sources of supply. As a result of these significant ongoing investments, we are able to meet the forecasted needs of our customers, and have chosen to maintain sufficient inventory to allow for flexibility in timing of shipments.

Cobalt-60 is currently produced in CANDU and RBMK power reactors in Canada, Russia, China and Argentina under long-term supply agreements between the reactor operators and the source manufacturers. As a result of reactors reaching the end of their design life, some portion of the global Cobalt-60 supply will need to be replaced over the coming decades.

At Nordion, we have a three-pronged strategy for ensuring a reliable, long-term supply of Cobalt-60. We call it “Extend, Expand and Develop.” It is important to note that these approaches are being pursued together, much in the same way that you would have a mix of different asset classes and horizons in your investment portfolio.

### **Extend: New Agreements**

The near-term strategy, “Extend,” involves extending supply contracts with our existing suppliers, with whom we have had very successful relationships, some lasting more than 4 decades. These suppliers have a clear understanding of the important contribution that Cobalt-60 makes to the healthcare industry, so they attach special value to it beyond what shows up on the P&L statement.

### **Expand: New Reactors**

In the “Expand” strategy, the objective is to duplicate the existing CANDU and RBMK cobalt production technology at reactors that are not currently producing cobalt. Globally there are 29 operating CANDU reactors, of which only 10 currently produce cobalt. There are 11 operating RBMK reactors, of which only 4 currently produce cobalt. This creates a broader range of opportunities, and could further diversify the supply mix geographically since many of these reactors operate outside of Canada. This list of reactors would include CANDU reactors at Wolsong, Cernavoda, Point Lepreau and CANDU-derived reactors in India, as well as additional RBMKs at Kursk and Smolensk in the Russian Federation.

### **Develop: New Platforms**

The “Develop” strategy, which presents the greatest opportunity, is the development of a new reactor technology platform for the production of cobalt. Neither the CANDU nor RBMK reactors were originally designed to produce cobalt. These reactor platforms are now able to produce cobalt as a result of detailed engineering development projects undertaken in collaboration with the reactor designer and the operating utility.

There are several other large international reactor platforms that may be adaptable for cobalt production including those of Westinghouse, GE Hitachi, AREVA and Rosatom.

### The Future of CANDU

It is important to note that although the CANDU reactor fleet is aging and some units will reach the end of their initial 25-year design life in the coming decade, many of the operators of CANDU reactors have committed to a refurbishment program based on economic attractiveness and criticality of nuclear power to the overall energy mix.

In the Long Term Energy Plan (LTEP) published in 2014 by the Province of Ontario; for example, the government has committed to refurbishing the remaining 6 units at Bruce Power as well as the 4 units at Darlington Nuclear Generating Station. These units will be refurbished between 2016 and 2030, and will add another 25-30 years to the operating life of the reactors. In fact, there have already been several successful refurbishments of CANDU reactors, including Wolsong-1 in South Korea, Point Lepreau in New Brunswick and units 1 and 2 at Bruce Power. The Embalse reactor in Argentina is due to begin refurbishment in mid-2015.

### Conclusion



In summary, Nordion has provided a safe and reliable supply of cobalt to the industry for more than 50 years. In the past 15 years we have diversified and enhanced our supply chain by adding 7 new cobalt producing reactors. Internally, we have expanded our regulatory, logistics and engineering capabilities

to better serve our customers. In addition, we have a dedicated Isotope Supply team focused on our Extend, Expand and Develop strategy, and our strong inventory

position will provide stability through reactor refurbishment and the transition to new sources of supply. Nordion understands the importance of cobalt supply to the gamma processing industry and we remain committed to providing a sustainable, reliable and safe supply of cobalt.



### **NORDION SUPPORTS THE GAMMA PROCESSING INDUSTRY**

Nordion is a world leading supplier of Cobalt-60 and design authority for commercial gamma processing systems. We further support the gamma processing industry through education, applied R&D, irradiator maintenance and upgrades, irradiation services, and irradiator training.

Gamma sterilization technologies help our customers improve the health and well-being of people around the globe.

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