MDS Nordion *Tel: 613-592-3400 ext. 2059*
447 March Road *Fax: 613-591-7419*
Kanata, Ontario
Canada, K2K 1X8
e-mail:egan@mds.nordion.com

207 **DM33**
Projet de modification des installations de stockage des déchets radioactifs et réfection de Gentilly-2
Bécancour **6212-02-005**

MDS Nordion
Science Advancing Health

Fax Transmission

To:	Mme Anne-Lyne Boutin	Fax:	418-643-9474
Company:	BAPE	Date:	December 9, 2004
Sender	Cathy Egan	Copy:	
Subject:	MDS Nordion submission	Total # of pages including this page	5

Please see attached as per my e-mail.

If transmission is incomplete or unclear, please contact the sender.

December 9, 2004

Bureau d'audiences publiques sur l'environnement
Édifice Lomer-Gouin
575, rue Saint-Amable, bureau 2.10
Québec (Québec) G1R 6A6

MDS Nordion

MDS Nordion is a global healthcare company specializing in radioisotopes, radiation, and related technologies used to diagnose, prevent and treat disease. MDS Nordion's 1000 employees are working together to advance global health through science, technology and innovation. The company is part of MDS Inc., an international health and life sciences company based in Canada. In many of its products and services, it is among the largest and most respected companies in the world. MDS fights disease.

A Canadian Contribution

As a key supplier of cobalt-60 in the world, Canada has been leading the world in exploring its uses for nearly 50 years. Cobalt-60 is created from cobalt-59, a rare non-radioactive element of which there are significant ore deposits in Canada. After being mined, cobalt-59 rods are placed in Canadian-made CANDU reactors for a period of one to three years. While the reactor produces electricity, some of the stable cobalt-59 atoms absorb a neutron and become the radioisotope cobalt-60. Seeking a return to stable form, the cobalt-60 emits high-energy gamma radiation in a process known as radioactive decay.

How the Sterilization Process Works

The high energy gamma radiation kills harmful bacteria and organisms. Cobalt–60 is so effective in sterilizing products that some 45 percent of the world's supply of disposable medical devices, such as sutures, bandages, gloves, gowns and syringes are sterilized with this important medical isotope.

Medical Sterilization

Today, we may take sterilized medical supplies for granted. They are used in hospitals and clinics around the world, preventing infection and reducing illness and death. Even in the home, products such as cotton balls, contact lens solution, bandages and powders have been sterilized. We use these sterilized products in our homes every day.

An estimated 80% of all surgeon's gloves are sterilized with cobalt-60. Certain products can only be sterilized with cobalt-60: biological materials: tissue for transplant, plasma, serum, etc.; alcohol swabs; and sealed medical devices used for blood collection, endoscopic procedures, and for use with certain catheters. Many other products are optimally sterilized with cobalt-60. The sterilization process is also necessary for drug development and delivery; sterile labware is essential for drug research and irradiated raw materials and containers are essential for germ-free pharmaceuticals.

A process called gamma sterilization (gamma radiation emitted from the cobalt-60) is the key to making sure our many medical disposable supplies and consumer products are safe to use. Some 45 percent of the world's supply of disposable medical devices are sterilized using cobalt-60. MDS Nordion is the world leader in gamma sterilization technology with an approximate 75 percent market share in the cobalt-60 market. In addition, the gamma sterilization market continues to grow rapidly as the population ages, as new and huge markets (China and India for example) open up for disposable medical products, and as new applications are found.

Food with Peace of Mind

Gamma irradiation also has enormous potential for preventing food-borne illness, a problem that costs thousands of lives and millions of dollars each year. In fact, the World Health Organization reports that contaminated food is "perhaps the most widespread health problem in the contemporary world and an important cause of reduced economic activity." The food irradiation process destroys harmful bacteria such as E.coli, salmonella and listeria in meat and poultry.

In addition, the United Nations estimates that one-quarter to one-third of world food production is lost due to pests, insects, and bacteria that destroy crops causing famine and disease. Irradiation can eliminate the organisms that cause this destruction in grain, fruit and spices.

Food irradiation is safe, a fact proven by over 40 years of intense research. It is endorsed by numerous organizations including the World Health Organization, American Medical Association and the Mayo Clinic. Irradiation of red meat and poultry is approved in the United States but not in Canada.

Cobalt-60 Production Process

For cobalt-60 production, stainless steel adjusters are replaced with neutronically equivalent cobalt-59 adjusters. With its very high neutron flux and optimized fuel burn-up, the CANDU® has a very high cobalt-60 production rate in a relatively short time. Many design considerations and requirements for the production of cobalt-60 in CANDU® must be assessed, such as; operator and public safety, minimum impact on station efficiency and reactor operations, shielding requirements during reactor operation

with cobalt-60 adjusters and removal of the cobalt-60 adjusters from core, transportation within the station, and finally the processing and shipment off-site. This Canadian technology for cobalt-60 production in CANDU® reactors, designed and developed by MDS Nordion and AECL, has been safety, economically and successfully employed in many CANDU® reactors with over 195 reactor years of production.

Hydro-Québec

Hydro Québec started thinking about converting Gentilly-2 NPP, a CANDU-6 reactor, into a cobalt-60 producer right after commercial operation began in 1983. The first step was to conduct a technical feasibility study which was completed jointly by the utility and the reactor designer, AECL.

At the end of 1983, this study concluded that the cobalt irradiation could be carried out in such a way that it would not interfere with the normal operation of Gentilly-2 NPP as an electric generating station or with safety to people or the environment.

Following the positive outcome of the technical feasibility study, Hydro Québec prepared a business case based on the technical feasibility study and on the utility's own assessment for a proposed five year cobalt-60 production contract. It took into account the internal costs and constraints. The business case was approved by the utility's Board of Directors, and by mid 1984 the contracts were signed with then AECL Radiochemical Company (now MDS Nordion) to produce cobalt-60.

Hydro Québec contracted or conducted itself the relevant design and safety studies, the purchasing of all materials and equipment, the quality assurance of the new cobalt-59 adjuster rods, as well as the implementation and commissioning of all the necessary modifications. Following approval being granted by the Regulatory Body (AECB), the first cobalt-59 rods went into the reactor core in 1984, and the first discharge and processing of cobalt-60 occured in 1985.

Gentilly-2 produced cobalt-60 for five years, until 1989, as per the contract. That contract was not renewed because of the then weak market for cobalt-60. However, the gamma sterilization market began to grow in the early 1990s. As a result, new discussions began regarding the possibility of producing cobalt-60 again in the Gentilly-2 reactor in late 1994. Early in 1997, Hydro Québec signed a new five year contract with MDS Nordion. A full update of the safety analysis was required, submitted to and accepted by the Regulator. After one year of irradiation in the reactor core, the first cobalt-60 discharge occurred in 1998. A subsequent six year contract for cobalt-60 production was signed in December 2001. Hydro Québec's Gentilly-2 Nuclear Power Plant has been operating successfully with cobalt adjusters and produced cobalt-60 from 1984 to 1989 and since 1997.

The Future

The world demand for cobalt-60 continues to grow. There exists a demand which is greater than supply. There exists in Hydro Québec an ability to safely and reliably produce this extremely important medical isotope on an ongoing basis. Hydro Québec is recognized as a world leader in the production of cobalt-60, often being called upon to consult to other CANDU operators who are considering cobalt-60 production. Hydro Québec has a strong and very successful track record in producing cobalt-60. This business is good economically for Hydro Québec and imperative to the maintenance and improvement of world health. MDS Nordion very strongly supports the refurbishment of Hydro Québec and looks forward to a very long and beneficial relationship in the future. It is one of those relationships which represents not only a win/win for the two parties involved but also a win for the improved public health of the population around the globe.

Sincerely Submitted,

John Corley
Sr. Vice President, Ion Technologies
MDS Nordion