MDS NORDION–A CANADIAN RADIOISOTOPE SUCCESS STORY

Science Advancing Health

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Many of you have a focus on the development, marketing and operation or regulation of nuclear reactors both here and around the world. Your job is to ensure that these facilities operate safely and provide clean, affordable electricity for thousands of homes and businesses. You do your job extremely well, and I want to commend each of you for your efforts. Today I would like to talk about another market sector that has benefited from the application of nuclear technology.

As most of you know, at MDS Nordion we use nuclear science and technology to advance human life and health through a wide range of applications. We could not do this without the strong partnerships we have formed with the Canadian nuclear power industry over more than 50 years.

Together, we have developed and applied radioisotope technology in ways that have saved millions of lives around the world. This is a success story of which we all can be proud. It is a success story that we should enthusiastically share with others.

As an industry, we are often challenged by activists, who fear and attack anything nuclear and who do not care to understand how vital nuclear energy and nuclear science are to an environmentally sound, economically healthy future. MDS Nordion has not escaped this kind of public scrutiny, but much of this criticism is muted by the tremendous contributions we have made to medicine and health care generally.

That is why it is so important for you to see MDS Nordion's story as a success story that everyone in the industry has contributed to, in the support they have provided, and in the products or services they supply.

How did this happen? In 1946, Roy Errington and his two employees began selling radium that had been stockpiled during World War II. This was to be the genesis of the company that today is MDS Nordion. Errington looked for ways to utilize radioisotopes in the health care field. An early application included the use of radium as a cancer treatment. In 1947, the NRX reactor came on line, and in 1952, Errington's small company became part of Atomic Energy of Canada Limited (AECL). This allowed him the access to state-of-the art research and development facilities and scientific resources. Roy Errington forged a partnership 51 years ago that endures today – the Canadian nuclear power program and MDS Nordion working together to develop and apply life-saving technology.

Of course, Roy's company has been through many changes over the last half century. First, we were the AECL Commercial Products Division, then the AECL Radiochemical Company and in 1988 we became Nordion International, which was successfully privatized in 1991. We are now known as MDS Nordion to reflect our strong participation and integration into MDS--a dynamic international health and life sciences company. And as we have recently celebrated our 50th anniversary as a company, we will carry our proud heritage forward as we move ahead to meet the challenges of the next century.

I would like to recount some of this proud heritage for you. I will be brief because many of you have not only heard some of this before, some of you were there. Nonetheless, I believe it is helpful to remember how we arrived here today as we focus on and define our industry's role in the new millennium.

In the 1950s, the use of radioisotopes in cancer therapy became widespread. Cobalt 60 was used to treat most of the diagnosed cancers of that time. In fact, Theratronics International continues to provide this equipment even today. It is safe to say that cobalt beam therapy has saved literally millions of lives around the world.

In 1958, the NRU reactor came on line. For 40 years it has been and remains the world's most important isotope production facility producing Cobalt-60 for cancer teletherapy and Molybdenum-99 for nuclear diagnostic imaging.

The very next year in 1959, the Rectilinear Scanner opened up a whole new realm of possibility and created a high demand for iodine 131 as this new tool for medical imaging became the state-of-the-art.

As we entered the 1960s, the use of Cobalt 60 to sterilize medical disposable products emerged as a core element of our business. The sources of Cobalt began with NRX and NRU, but with the production of Cobalt at Douglas Point, Pickering, Embalse, Bruce, and Gentilly, CANDU reactors have and continue to supply this vital raw material. In fact the Bruce B and Gentilly 2 reactors supply the majority of our Cobalt 60. How important is this to the manufacturers of health care products?

Today, 50% of the world's medical products are gamma sterilized. 80% of these products are sterilized with Cobalt provided by MDS Nordion and Canada. In fact, over the past 27 years, MDS Nordion has shipped over 400 million curies of Cobalt 60 around the world for health care applications. Because of its penetrating capacity, Cobalt 60 irradiation sterilizes critical products such as syringes, sutures and endoscopic devices used for laparoscopic surgery.

The development that had perhaps the most impact on nuclear medicine was the marketing in 1972 of fission product Molybdenum 99—which decays into Technetium 99m. This development quickly transformed the way Technetium-99m was supplied and forever transformed the diagnostic imaging process. To give you an idea about just how important MDS Nordion-supplied Molybdenum has become; two-thirds of the world supply comes from Canada. The Technetium it generates accounts for 80% of the diagnostic procedures used by the nuclear medicine community. This equates to 50,000 procedures every day or 20,000,000 procedures per year around the world. Without this imaging technology the only other course of action is invasive surgery, which is costly, less effective and more stressful for patients.

So you can see how the growing demand for Technetium and the Canadian nuclear program's ability to supply it, established our leadership as a supplier to the nuclear medicine community.

We did this by focusing on the needs of our customers and developing an unparalleled worldwide distribution system. And the market for Molybdenum 99 continues to grow as we find new applications in the diagnosis of heart, kidney, bone and blood diseases.

Reactor produced isotopes are also used in new and innovative diagnostic and therapeutic applications. For example, Iodine 125 and 131 are used to tag monoclonal antibodies. These products are injected into the body for detection and treatment of specific forms of cancer. We have an agreement with Neoprobe Corporation to radiolabel, with Iodine 125, Neoprobe's CR49 antibody which will be administered to cancer patients in a surgical technique called Radioimmunoguidedsurgery (RIGS). Approximately three weeks before an operation to remove

colorectal, breast or ovarian cancer, the patient is injected with the I-125 CR49 antibody which is specific for antigens found in these cancers. During surgery, after removal of all visible tumour, the surgeon scans the abdominal cavity with a small hand-held gamma probe in search of residual tumour which is identified by the I-125 label on the antibody. Any tissue containing counts of twice background radiation is then removed.

With our leadership position comes a responsibility to provide a long-term reliable supply of these life saving products. In that regard, we have launched one of the most exciting developments in our long history. With an investment of $140 million, we are building two specialty reactors that will come on line in 1999 and 2000. Maple I and Maple II will be the first reactors in the world that are dedicated solely to isotope production and privately owned.

These reactors, and the accompanying state-of-the-art processing facility, assure that a secure, stable supply of Molybdenum 99 will be available when NRU is decommissioned and well into the next century. They are also symbolic of Canada's enduring commitment to leadership in this field. We are pleased to continue our partnership with AECL on this project. They are applying their world-renowned expertise in reactor technology to design, build and operate these reactors at Chalk River on our behalf.

There are many opportunities that we can capitalize on together as an industry. These are not just success stories we can share and feel good about; they are hard opportunities for business growth. One such opportunity is the growing marketplace for medical sterilization.

While the North American and European markets account for most of the medical sterilization done today, a major opportunity is stirring in other parts of the world. It is no exaggeration to say that emerging markets have the potential to double the size of the medical sterilization market within the next 15 years.

I want to illustrate how these markets have the potential for expansion by looking at some interesting statistics. Gamma sterilization has reached a processing level of 173 million cubic feet worldwide, with 135 million cubic feet of the total (about 78%) accounted for by Europe and North America and 38 million cubic feet for the rest of the world.

The possibility of major growth in emerging markets becomes apparent when one considers the potential in two of the world's largest countries, India and China. According to the Health Industry Manufacturers Association, the Chinese market for medical technology products is growing at a rate of 23% and the Indian market is exceeding that slightly at a growth rate of 24%.

In each country, both local and multinational companies are rushing to expand capacity to service this growing demand and our industry is going to be a part of it.

If we calculate the installed base of Cobalt used for medical sterilization and irradiation on a per capita basis we can get an interesting picture of this potential. The installed base of Cobalt in the US, for example, is estimated at 100 million curies and this equates to roughly 0.4 curies per capita. In China the installed base is 11 million curies with a per capita level that is only 2% of the US total and in India it is 2 million curies with a per capita level at 0.5% of the US amount, or only 0.002 curies per capita. When we consider that over 35% of the world's population lives in China and India alone, it becomes apparent that these markets present an immense opportunity.

Another exciting opportunity as we look to the future is food irradiation. Currently, single-use medical sterilization accounts for 80 % percent of the installed base of Cobalt 60, with approximately 20 % utilized to treat other products including cosmetics, pharmaceuticals, packaging, food and spices. We have a huge and exciting opportunity to grow the food irradiation market exponentially.

Unfortunately, it is an opportunity borne of tragedy. In 1993, Nancy Donley of Washington State took her 6-year-old son, Alex, out for a hamburger. Within a few weeks he and four other children had died from E-coli poisoning, in an outbreak that made over 600 people ill.

The deaths that resulted from E-coli contamination at Jack-in-the-Box restaurants horrified the world and called attention to a food safety problem that results in 9,000 deaths every year. The debate over food safety continues today, particularly in the United States.

To provide you with some context there are 32 billion pounds of poultry consumed in the US each year; 17 billion pounds of pork and 12 billion pounds of hamburger meat.

Last year President Clinton launched a $43 million US food safety initiative to combat the increasing threat of food poisoning. These funds will be spent on an early warning monitoring system, public education and the development of new food safety technologies. The article briefly mentioned irradiation as one solution to preventing food poisoning in everything from apple juice to red meat.

Since then, Hudson Foods, an US-based meat processor was forced to recall 25 million pounds of red meat because of a detection of E-coli. This incident and several other outbreaks of both E-coli and salmonella have focussed more attention by the processing industry, the government and the public on irradiation. For the first time, political leaders in both the United States Senate and House of Representatives have passed legislation with favourable references to this technology. In November 1997, President Clinton signed into law the Food and Drug Administration Modernization Act requiring the FDA to approve the irradiation of red meat. As well, prominent media such as CNN, the Washington Post, New York Times and Newsweek magazine have broadcast or printed positive stories on food irradiation.

We firmly believe that it is not a question of whether food irradiation will be used, rather, it is a question of when.

At our International Meeting on Radiation Processing held last May in California, I was encouraged by the efforts that some are making in the irradiation of food products in the United States, Belgium, France and South Africa.

However, I am sorry to say, we as an industry have not yet convinced society that we can be an important part of the solution. The world has at its disposal a life saving technology to greatly reduce the risk of foodborne disease.

On the regulatory front, we continue to challenge proposals that would present unwarranted barriers to the free movement of foodstuffs. Examples include many labeling requirements that would be expensive to implement, create unnecessary bureaucracy and would be of no valuable to the consumer. Other developments in the regulatory arena also point to expanded opportunities for our technology. By the year 2001, the produce industry will no longer be able to rely on methyl bromide, the primary treatment for fumigating fresh fruits and vegetables, due to its ozone depleting properties. The only replacement technology that has the potential to both effectively disinfest and preserve fresh produce is irradiation.

As an industry, we have failed so far to make commercially significant inroads with the largest processors of all these food products. We are often told, “we do not want to become the targets of activist and besides, there is no demand for your technology and your products.” Further, supportive organizations all say, “It is your process. You get something going and we will join you. We are not going to push your technology and your process unless you take the lead.” I should note, however, that the reverse has occurred with red meat processors in the United States. The American Meat Institute and Cattlemen’s Association have both publicly endorsed irradiation.

There are a number of activist groups out there continuing their attempts to stop us, using scare tactics and pseudo-science. The most persistent of these is Food and Water, Inc. Why should a small group of opponents be taken seriously when we have such overwhelming support from scientists, academics and respected organizations? Because they are vocal and well organized and we are not.

So, as you can tell, this is not just a history lesson today. Yes, MDS Nordion's story is a Canadian nuclear success story. But there is more to it than that. We are on the verge of a new century and many exciting breakthroughs, but we are still, all of us together, misunderstood by many people around the world. They may not be environmental activists, but they are, at best, uneasy about the nuclear industry. For example, earlier I mentioned Nancy Donley who lost her son to food poisoning. Nancy went on to found S-T-O-P, Safe Tables Our Priority. Nancy and her food safety advocacy group oppose food irradiation, even though it could have prevented her son's death.

How do you personally feel about the benefits of nuclear medicine and food irradiation? What do your family, friends and spouse think about it? Do you talk about the benefits of these vital technologies at social events or family discussions?

How can we move forward?

First, we can work with renewed vigor to educate people about the contributions we have made together as an industry to provide clean, environmentally safe energy; to protect and enhance human life; and to lead the world in the development and application of nuclear science and technology.

Second, we can work together to develop new markets for gamma sterilization. CANDU reactors already supply the bulk of the world's cobalt 60 supply, and as you have heard, we can now work together to ensure that even more cobalt is required as medical product sterilization expands.

Third, we can continue to build a bright future for nuclear medicine. In the case of nuclear diagnostics, the developing world is only now beginning to utilize this technology. There is also the potential for nuclear medicine to continue its growth beyond imaging technology, as new radioisotope-based treatments are developed for a number of diseases, including heart disease.

Fourth, by putting our collective muscle into securing the necessary regulatory approvals, we can ensure that food irradiation saves lives. In fact, I believe it is our obligation to do so. Our collective experience and efforts can also be put towards thwarting the activists who would stand in the way of this life-saving process.

Advances in nuclear power over the last 50 years have been tremendous. I, again, wish to commend each and every one of you for the contributions you have made to our collective success as an industry.

We have a story to tell. Is it about radioisotopes? Yes, but what it is really about is the success of nuclear science and the can-do attitude of pioneers like Roy Errington and of each of you here today.

I am confident that our partnership, which has brought us so much success, can be infused with new life and new goals. Together, we can continue to make a difference to the health of people around the world.