

# Continued Fallout Over Canada Reactor Shutdown

**A**lthough routine shipments of medical radioisotopes have been restored after the Chalk River, Ontario, National Research Universal (NRU) reactor was restarted on December 16 under a special enforcement allowance from Canada's nuclear regulatory agency, debate and controversy continue. Much of the commentary is focused on circumstances leading up to the almost 1-month shutdown, measures taken to restart the reactor, and strategies to address potential shortages in the future.

In the February 26 issue of the *Canadian Medical Association Journal* (2008;178:536–438), editorial writer Roger Collier contrasted European readiness to manage unexpected reactor shutdowns with that of the United States and Canada. He noted that Europe's 2 largest isotope suppliers, the Nuclear Research and Consultancy Group (NRG; Petten and Arnhem, The Netherlands) and the Institut National des Radioéléments (Fleurus, Belgium), not only coordinate their production schedules so that 1 reactor is always running but also maintain open and regular communication with other global suppliers.

Collier's commentary highlighted criticisms directed at Ottawa-based MDS Nordion, which markets the radioisotopes produced at the Chalk River reactor and which turned over operation of the facility to Atomic Energy of Canada, Ltd. (AECL), in 2006. One manager from NRG cited Nordion's historical reluctance to share information with the global community. Another source, Guy Turquet de Beauregard, vice president of the Europe-based Association of Imaging Producers and Equipment Suppliers, called for development of a global coordination policy: "We need to improve communication between North America and Europe."

Alan J. Kuperman, PhD, a U.S. academician and critic of Canadian isotope policies, accused Nordion of using scare tactics to maintain its North American dominance in radioisotope markets: "There is all sorts of surplus capacity. Nordion and AECL obviously knew there was an option of going to other suppliers. . . . Instead, they went to the public and the Canadian government. That was misleading and, one could argue, socially irresponsible."

MDS Nordion responded to these comments by reporting that strenuous efforts were made to identify alternative sources, adding: "Given that the extended shutdown of AECL's NRU reactor was a precipitous event, any type of advanced international schedule collaboration would not have mitigated this unplanned event."

Jean-Luc Urbain, MD, president of the Canadian Society of Nuclear Medicine (CSNM) and an SNM member, agreed that coordination of alternative sources would have been difficult if not impossible. He told Collier that he believed

European isotope producers were unprepared to supply U.S. and Canadian nuclear medicine facilities during the outage. However, he called for fundamental change in the Canadian radioisotope production structure. "The status quo is totally unacceptable," he said, citing the need for a backup plan that includes improving global coordination and communication. For the long term, he noted that the most important goal is getting the 2 MAPLE reactors at Chalk River on line as quickly as possible, a task that AECL has found challenging. "Having 1 reactor and no backup source in Canada is extremely dicey," Urbain said.

Unlike many Canadian economic analysts who have addressed this topic, Urbain was not threatened by news from across the border that academic and government researchers are calling for a step-up in commercial radioisotope production in the United States. Redundancy is essential, he said, citing a hypothetical case in which the Chalk River facility suffered a total, long-term shutdown: "In that worst possible scenario, you definitely want to have isotope production somewhere else. It would make sense to activate a reactor in the United States. . . . We can't really use the argument that Canada's nuclear industry will suffer if the rest of the world becomes less dependent on 1 supplier that has definitely shown its weakness. . . . Isn't the worldwide health of citizens more important than the commercial interests of 1 or 2 Canadian companies?"

## U.S. Efforts Growing

Calls for increased U.S. medical radioisotope production continue to escalate, despite the restoration of supplies from Chalk River. Faculty and staff from the University of Missouri–Columbia Research Reactor (MURR) center, the largest U.S. university research reactor, were quick to respond with plans to assess the feasibility of producing  $^{99}\text{Mo}$  for the domestic nuclear medicine market. In the February 26 issue of the *Toronto Globe and Mail*, reporter Shawn McCarthy reviewed these and other efforts and their implications for the North American nuclear medicine supply market. Ralph Butler, director of the MURR center, told the *Globe and Mail* that the Missouri facility, which is planning a \$40 million upgrade, is capable of supplying as much as 50% of the U.S. weekly demands for  $^{99}\text{Mo}$ . Although Butler and his colleagues had previously looked at increasing isotope production, the events at Chalk River caused them to push forward with a feasibility study and funding campaign. "We kind of jumped things ahead now to catch the momentum," he said.

One advantage the MURR researchers would bring to  $^{99}\text{Mo}$  production is their current work with the U.S. Department of Energy to switch to low-enriched uranium for

processing, a transition that the AECL has been slow to make in Canada. The continued use of highly enriched uranium at Chalk River and attendant concerns about regularly shipping these materials from the United States have been the focus of international attention. “If there is a security hit somewhere in the world, the U.S. will close its borders to the shipment of radioactive materials,” Butler said. “And when you are talking 35,000 procedures per day in the U.S. alone, that’s a huge impact to the medical community.”

### Long-Standing Concerns

For many in the nuclear medicine community, the events at Chalk River merely reinforced concerns that have been voiced repeatedly and in numerous venues over the last decade. In 2005, Menard and others from the American Nuclear Society, including SNM members, issued a strong statement and analysis in the journal *Applied Radiation and Isotopes* (2005;63:157–178), calling for a vigorous national radioisotope program. They wrote, “the nation needs a consistent, reliable supply of radioactive and stable isotopes for research,

medical, security, and space power applications” and pointed to the negative consequences of continued reductions in Department of Energy support for radioisotope programs.

In September 2007, the National Research Council and the Institute of Medicine issued the report *Advancing Nuclear Medicine Through Innovation*, which cited inadequate domestic supplies of medical radionuclides as an obstacle to both day-to-day practice and research. The group who prepared the report called for improved domestic medical radionuclide production.

Alexander McEwan, MD, president of the SNM and a past president of the CSNM, told Newsline earlier this year that the Canadian reactor shutdown “presents the nuclear medicine community with a compelling example of the need for government and regulatory agency attention to enhanced support for redundancy and back-up in radioisotope production to ensure that we are able to continue to provide high-quality and much-needed care to our patients.”

Newsline will continue to follow up on events related to the Chalk River shutdown and resulting discussions on new approaches to radioisotope production and supply. ✧