

Canada's medical isotope crisis: A way forward

By Jatin Nathwani, PhD, P.Eng.

Editor's note: The headlines over the recent closure of the Chalk River reactor that produced isotopes for hospital patients around the world were naturally dominated by the medical fallout. The political name-calling between the government and the opposition over the handling of the issue also competed for public attention. Lost amid the scare stories and mud-slinging was the reasoned voice of one of the province's leading engineers. This paper is based on Jatin Nathwani's testimony before the House of Commons Committee on Natural Resources in June.

Executive summary

Jatin Nathwani, executive director of the University of Waterloo Institute for Sustainable Energy, appeared before a Commons committee on June 18, 2009 to urge the government to remain in the isotope production business. Nathwani argued that too much is at stake to abandon an industry in which Canada, until recently, was a world leader. He called for the resurrection of the troubled MAPLE reactors, saying their technical concerns can and need to be resolved in the national interest.

Nathwani also called for a more reasoned debate about nuclear technology. He urged the politicians to judge nuclear technology on the basis of its "net benefit" and not to succumb to popular anti-nuclear sentiment.

Introduction

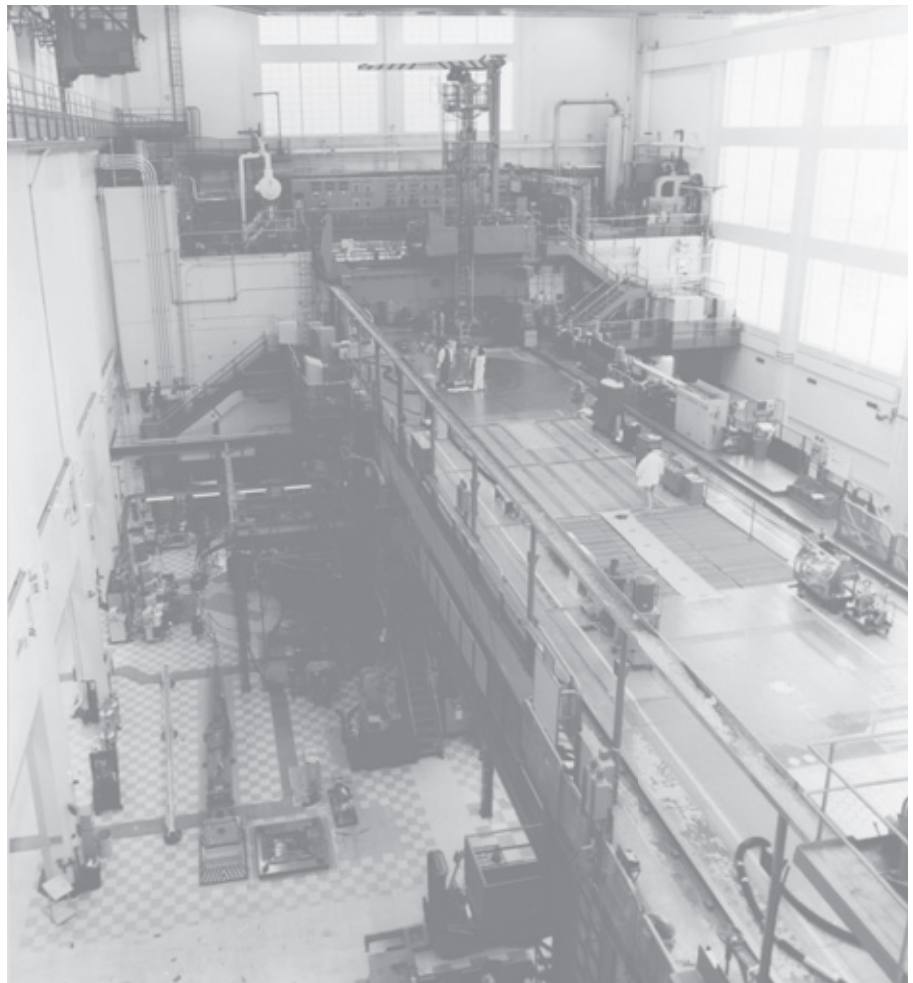
The shutdown of the National Research Universal (NRU) reactor at Chalk River, Ontario, has again brought into sharp focus the critical need for a reliable supply of isotopes to our hospitals. The most compelling and difficult issue, however, is the reliability and safe operation of a single aging reactor on which depends the well-being of so many—both in Canada and globally.

The realization of such extreme dependency and vulnerability on a single source is a matter of profound shock and incredulity. How did we get into this corner? And what steps do we take next?

The current medical isotope crisis that has dominated newspaper headlines is but the simplest and clearest example of how we effectively ignore the benefits of nuclear technology because the political "comfort zone" is too narrow to allow for a more balanced and nuanced response.

I will confine my comments to three aspects:

1. the need for a reliable supply of isotopes;



An interior view of the Chalk River reactor. It was the world's largest source of medical isotopes until its closure earlier this year.

2. technology choices and future options; and
3. some suggestions on governance and public dialogue for acceptance.

The need for a reliable isotope supply

The government's recent indication to exit from the supply side of isotopes production by 2016 would make us dependent on sources outside of Canada. For a resource this critical to the

overall health and well-being of Canadians, the exit strategy does not appear to be prudent.

The provision of a reliable supply of medical isotopes is far too important to have the terms and conditions of supply and prices determined by others. If frustration with current costs is the primary driver for determining exit, what of the higher costs later when we have conceded all control of any assurance of our own supply?

Upon exit, we simply become a minor player with no influence. Having enjoyed a

reasonable degree of success in the global markets, what is the compelling case for jeopardizing our own security of supply?

And if we take the long view, could the exit strategy not compromise our ability to control health-care costs if, over time, the use of isotopes continues to become more widespread in medical practice?

The fact that Canada has played a leadership role in the development and application of the innovations in nuclear medicine and nuclear technology over the last 50 years is worth noting. Why would we simply walk away? Is there not a case for nurturing our own strengths and putting in place the solutions for realizing the benefits of this technology into the future?

Technology choices and options

One option is a combination of best-effort, short-term fixes for the NRU reactor. That would allow us to muddle along until 2016 or so. Given the age of the reactor, this is the best that can be done in the short term. But this is not a credible or a sustainable solution for the long term. If we accept that the need for medical isotopes is not about to disappear, a more robust solution is necessary.

In light of our current difficulties, it makes sense to revisit the decision to cancel the MAPLE reactors. There are technical issues that need to be resolved to be sure, but a strong recommendation by the House of Commons Committee on Natural Resources to reconsider the decision would pave the way for the resolution of the technical issues. Whatever the business model, whether it is a public-private partnership, government ownership or some other, the goal is to ensure the national interest is taken into account.

Atomic Energy Canada Limited halted work on the reactors last year after 15 years and \$300 million had failed to yield a replacement for the NRU. Bringing the already built MAPLE reactors to an operating state over the next six to 18 months offers the best prospect for an assured supply of isotopes for Canadian needs.

Governance and public acceptance

When I appeared before the House of Commons Committee on Natural Resources on February 7, 2008, I advocated an amendment

to the *Nuclear Safety and Control Act* (NSCA) that would have included a test of “net benefit” to Canada. Such a legislative test would provide a stronger framework and guidance to the regulatory function, clarity of direction to industry and broad public support for a coherent decision-making rationale in the public interest.

We cannot allow ourselves to be stymied by “perceived risk of reactor operation,” which places undue weight on hypothetical imaginings and ends up denying patients the healing benefits of the reactor technology. The costs are real, but not astronomical; the risk is not zero, but low—while benefits are large and positive. The trade-off to serve the public interest is clear and simple.

There is a small but strong anti-nuclear sentiment that dominates public discourse on matters nuclear. Even though the safety risks are generally very low, the social amplification of risk through the media gives rise to a political and cultural climate that makes it difficult for policy-makers to take a strictly rational approach. It reduces their comfort zone of operation and forces the easier way out—witness the exit strategy proposed by the government.

The time has come to shift the terms of debates around nuclear issues and help reduce the social friction so all parties will begin to articulate clearly the benefits of nuclear technologies. Over time, this would create sufficient space in the public sphere for a more informed dialogue.

The current crisis is but the simplest and clearest example of how we effectively ignore the benefits of nuclear technology, because the political comfort-space is too narrow for a more balanced and nuanced response. We create a cultural straightjacket that leads directly to an exit strategy—an easier and quicker response to a problem. However, such a rash decision does not take into account the full consequences in the long term. For Canada, it would be truly unfortunate to walk away from having built and led a successful enterprise around the production of isotopes without a determined effort to fix the short-term problems.

In conclusion, I have four simple recommendations:

1. Confirm the need for a robust and dependable supply of medical isotopes for use in medical practice and whether the trend for increased use is expected to continue;
2. Revisit the decision to cancel the MAPLE reactors. This is a credible path to a robust base for supply assurance long into the future;
3. Amend legislation to include a test of net benefit to Canada in the NSCA. This would provide a strong foundation for balancing difficult trade-offs in regulatory decision making; and
4. Commit to a useful public dialogue on matters nuclear to help create a positive environment for policy-makers to make rational decisions.

Jatin Nathwani, PhD, P.Eng., is a professor and the Ontario research chair in public policy and sustainable energy management in the faculties of engineering and environment at the University of Waterloo. Nathwani has extensive experience in the energy sector at the corporate level, focusing on strategy and policy development, business planning for long-term initiatives, contributions to the evolution of industry structure, management of regulatory affairs and environmental issues and timely integration of strategic R&D into business practice. Recently, he contributed to the development of the Ontario Power Authority's integrated power system plan focusing on the environmental and sustainability issues relevant to the planning process. He holds a PhD in chemical engineering and applied chemistry from the University of Toronto.

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