

Isotope maker calls for another look at scrapped reactors

Canadian life sciences company MDS Nordion wants the federal government to bring international experts to Chalk River, Ontario, to determine what it would take to fix 2 nuclear reactors that were supposed to have started producing medical isotopes in 2000. Some nuclear experts support the idea, saying fears about the reactors being dangerous are unfounded. Others, however, say much effort has already been spent trying to solve the reactors' problems, to no avail, and spending more time and money would be a waste.

In 1996, MDS Nordion hired the crown corporation Atomic Energy of Canada Ltd. (AECL) to design and build 2 nuclear reactors and a processing facility that would be dedicated to producing medical isotopes. MDS Nordion invested about \$350 million in the so-called MAPLE (Multipurpose Applied Physics Lattice Experiment) project, which was cancelled by the federal government in May 2008 because of ongoing technical difficulties.

On June 1, MDS Nordion issued a press release, urging the government to reconsider that decision, in light of the isotope shortage caused by the May shutdown of the National Research Universal (NRU) reactor, which provides a large portion of the world's medical isotopes. "Given that there are no domestic or international sources of supply that can fully mitigate this shortage, which has caused and will continue to cause unavoidable and serious disruptions to patient care, MDS Nordion has requested that the government direct AECL to honour its long-standing commitment to replace the NRU by bringing the MAPLE facilities into service," states the press release. In a June 18 opinion article in the *Globe and Mail*, Stephen P. DeFalco, president and chief executive officer of MDS Inc. (which owns MDS Nordion), wrote that the reactors "are complete, they are safe and they await final commissioning."



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The nuclear medicine community had high hopes for the MAPLE nuclear reactors, designed specifically to produce medical isotopes. The government abandoned the project in 2008, but isotope supplier MDS Nordion claims it's time to revive the project.

The main problem with the MAPLE reactors is that their power coefficient reactivity (PCR) values are positive. They were designed to have negative reactivity, which is considered safer because, in the event of an unexpected power surge, it

would create a negative feedback loop and prevent a run-away nuclear reaction. A positive reactivity value, on the other hand, could cause a problem to escalate. According to MDS Nordion, however, this problem can be controlled.

“There is nothing inherently wrong with a positive PCR,” says Jill Chitra, vice-president of strategic technologies for MDS Nordion. “If you have the appropriate safety systems in place, operating with a slightly positive PCR is not an issue.”

Chitra says that if nuclear experts were invited to take another look at the MAPLE reactors, they could either find a way to get a negative reactivity value or recommend how to change the safety systems to work with a slightly positive value.

Jatin Nathwani, Ontario research chair in public policy for sustainable energy management, also believes the government should consider reactivating the MAPLE project. On June 18, he told the House of Commons Committee on Natural Resources that it might be possible to bring the reactors to an operating state within 18 months.

“They are built. They have been successfully operated. Their commissioning tests have been successful, and the safety issue is not germane,” says Nathwani, a professor of management sciences at the University of Waterloo in Waterloo, Ontario.

But it is difficult for politicians to make scientifically sound decisions about nuclear reactors because of unfounded public fears, says Nathwani. “In simple terms, there is a small but strong antinuclear sentiment that dominates public discourse on matters nuclear,” he told the committee on June 18. “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.”

According to Alan Kuperman, however, there is little rationale to justify putting more effort into salvaging a project that many experts have already tried to save without success.

“The impression you get is that they built these reactors and started them up and had a little problem, and the government, at the first sign of trouble, bailed out and cancelled the project. Of course, that’s not true,” says Kuperman, director of the Nuclear Proliferation Prevention Program. “These things were supposed to start up in 2000. They were cancelled in 2008. They tried for 8 years to fix these reactors.”

Even if a new batch of experts could fix the reactivity value problem, Kuperman notes, it doesn’t mean they could fix other problems, such as known issues with the MAPLE project’s isotope production facility. And there would be major and costly complications if fixing the MAPLEs requires major design changes because the reactors have already been operated and are therefore “hot”.

“You are talking about decommissioning a nuclear reactor,” says Kuperman, a professor of public affairs at the University of Texas at Austin. “That’s a major-league operation.”

Some people in the nuclear medicine community say a less polarized view of the MAPLEs potential to safely and affordably be brought online might be more productive.

“My concern is that people are making it black or white,” says Dr. Sandy McEwan, a former president of the Society of Nuclear Medicine who is now a special adviser to Health Minister Leona Aglukkaq on medical isotopes. “But I’m sure there are shades of grey.” — Roger Collier, *CMAJ*

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