

Executive Summary

MDS Nordion's proposal secures a medium to long-term supply of medical isotopes for Canada by utilizing the existing MAPLE 1 and MAPLE 2 reactors, and associated New Processing Facility (NPF) located at Chalk River Laboratories (CRL) in conjunction with two additional technology elements.

The proposal involves three sections;

- Resolving the regulatory issue related to the Power Coefficient of Reactivity (PCR).
- Bringing the Multi-Purpose Applied Physics Lattice Experiment (MAPLE) facilities online in accordance with the Interim and Long Term Supply Agreement (ILTSA).^a
- Constructing a Technetium-99m (Tc-99m) generator facility, thus achieving medical isotope self-sufficiency in Canada.

The major milestones include:

- Atomic Energy of Canada Limited (AECL) collaboration with the South African Nuclear Energy Corporation (Necsa) to adapt their reactor code package, Overall System for Calculation of Reactors (OSCAR), to the operation of the MAPLE reactors. If successful the adaptation of the OSCAR code to the MAPLE reactors could resolve the mismatch between the predicted and observed value of the positive PCR that AECL discovered during nuclear commissioning of the MAPLE reactors.
- AECL to prepare and submit to the Canadian Nuclear Safety Commission (CNSC) a revised safety case based on operating the reactor under the OSCAR codes, with the existing small positive PCR.
- CNSC review of the new safety case, and issuance of a commercial operating license with limits and conditions commensurate with the details and merit of the safety case.
- Upon CNSC approval, AECL to complete the balance of non-reactor activities outlined in the ILTSA ^a agreement with MDS Nordion and commence commercial supply of Molybdenum-99 (Mo-99) to MDS Nordion's facilities in Ottawa for purification and distribution to the nuclear medicine community.
- MDS Nordion commits to retain 100% of the Mo-99 necessary to manufacture at its fully licensed Ottawa based production facility, 200 made-in-Canada "Canadian Technetium-99m Generators" ("CanTec") brand Tc-99m generators per week, for distribution to Canadian hospitals in all regions of Canada.
- MDS Nordion commits to construct, operate and maintain the "CanTec" production line, and perform everything necessary, including provision of licensed packaging, consumable supplies and facilitate transport logistics to all Canadian health care centres.
- MDS Nordion requires from Canadian health care entities, an agreement to purchase a minimum 10,400 generators per annum (200 per week).
- MDS Nordion will recover 100% of the capital and operating cost of supplying the "CanTec" Tc-99m generators from sales to Canadian health care entities on a price per unit basis, identical in concept to the commercial arrangements presently in place between hospitals

and their American Tc-99m generator suppliers. A minimum sale of 200 generators per week will be necessary.

Once implemented, Canada will enjoy security of supply based on two new nuclear reactors, and associated processing facilities plus a domestic supply of Tc-99m generators manufactured exclusively for Canadian patients. Through acceptance of this proposal, the Government of Canada has a high probability of achieving security of supply for the medium and long term.

This proposal outlines in detail all science, engineering, and regulatory issues, and contains a cost estimate and business plan details for the provision of a secure supply of medical isotopes for the entire Canadian health care system.

It is expected that the proposal can be implemented within 24 months. The project does not contemplate any physical changes to the MAPLE reactors, their ancillary systems or core configurations. AECL by hiring and collaborating with Necsa on the adaptation of the OSCAR computer codes to MAPLE operation could receive an operating license for the MAPLE reactors from the CNSC.

The result of this if successful can ensure Canada is self-sufficient with regards to the important medical isotope Tc-99m. In addition to the primary objective of secure supply of Tc-99m generators to all Canadians, this proposal will also result in 100% of the other critical medical isotopes required by the health care system. Specifically, the MAPLE reactors and associated facilities will also provide sufficient quantities to meet 100% of Canadian needs for Xenon-133 (Xe-133), Iodine-131 (I-131) and Iodine-125 (I-125).

It is important to note that although not requested by the Expert Review Panel for inclusion in expressions of interest, Canada requires these three isotopes with the same urgency as Tc-99m. Without I-131 for example, thyroid cancer cannot be treated using the most frequently prescribed, medically efficacious procedure. Future production of Tc-99m generators alone will not address these and other serious health care issues that will occur if imported medical isotopes are in short supply.

Recent experience indicates that the international market for medical isotopes is in danger of opportunity pricing as supply becomes scarce. A stable domestic supply, which is an inherent part of this plan, avoids significant financial exposure to the health care system. A stable domestic supply will result in long-term, predictable, health care costs.

Footnote a:

This proposal involves the MAPLE reactors and related facilities owned by Atomic Energy of Canada Limited ("AECL"). MDS Nordion has an exclusive (but presently disputed) long term contractual relationship with AECL for the supply of isotopes. MDS Nordion has an outstanding dispute with AECL and the Government of Canada regarding the contract and related matters ("Disputes"). One of those Disputes involves MDS Nordion's claim that it is entitled to have AECL specifically perform obligations under a contract and commission and operate the MAPLE reactors and related facilities. Because of existing contractual rights, MDS Nordion is an essential part of any dealings with the MAPLE reactors and related facilities. Subject to all of MDS Nordion's legal rights and remedies, and if a transaction can be designed that respects all of its legal rights and claims, MDS Nordion is pleased to file this proposal.