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Email or login: cdi.saclay@cisbio.com Password: ibanews*

INTRODUCTION

Dear Nuclear Medicine Professional.

As part of our ongoing support in the supply of ^{99m}Tc -generators, we are pleased to send you the Sixth edition of the Mo Supply Review. This edition provides again a rather positive short-term outlook on the supply of ^{99m}Tc . The restart of the Osiris reactor (Saclay, France) at the end of last year has created additional safety in the Mo supply. This further improves the global outlook already favored by the restart of NRU (Canada) and HFR (The Netherlands) announced in our last edition.

Despite these positive news, it should be clear to our community and to society, that the structural weaknesses of our ^{99m}Tc supply chain still prevail and that the long-term outlook is rather worrying. Although they have been refurbished, the key historic reactors are reaching the end of their lifetime and will need to be withdrawn from operation in the coming 3 years. Although, the JHR (France) new reactor is expected to be operational by then, analysis show that it will not be sufficient to cover the worldwide demand for isotopes.

Despite the fact that IBA is today the only radiopharmaceutical player to have engaged in a collaboration with both IRE and CEA in order to exploit the production of Molybdenum at JHR, we remain committed to create a stronger certainty in this matter. The recent OECD statements on the supply of medical radioisotopes highlighted the need to establish viable market conditions to ensure the sustainability of the ^{99m}Tc supply. In line with AIPES's recent statement (Association of Imaging Producers & Equipment Suppliers; please see link below), IBA will take the steps needed to restore economic sustainability and allow Nuclear Medicine to reach its full potential.

Our teams remain available to provide further information and perspectives on this topic.

INDUSTRIALS**AIPES, 2010: crisis and decision for nuclear medicine****February 2011, Competitor's website**

After having featured on the front-page of news media worldwide, the EU authorities (the Commission, the Parliament and the Council of Ministers) many governments, their agencies, EANM and many stakeholders are now ready and waiting for AIPES to help to solve the two main challenges :the short and long term supply solutions for 'moly' or ⁹⁹Mo, and a viable economic model for the supply of ^{99m}Tc and radionuclides in general.

Two avenues of approach are possible for us:

- a public-private partnership
- separate reimbursement of the radionuclide component

Lantheus Medical Imaging Announces First Commercial Production of TechnoLite® Generators from Low-Enriched Uranium-Produced Molybdenum-99**December 08, 2010 , Competitor's Web Site**

Lantheus Medical Imaging has begun commercial production of its TechnoLite technetium-99m generators using molybdenum-99 (Mo-99) produced with low-enriched uranium (LEU) targets.

The North Billerica, MA-based firm received the first commercial-scale batch of the LEU-based Mo-99 from NTP Radioisotopes, a subsidiary of South African Nuclear Energy (NECSA).

Lantheus Medical Imaging Extends Molybdenum-99 Contract With Nordion**January 06, 2011, Competitor's Web Site**

Demonstrates Company's Ongoing Leadership and Commitment to Supply Chain Diversification Strategy. Under the terms of the amended agreement, the contract has been extended until December 31, 2013. The original contract was in place until July 31, 2011. Based on the contract, Nordion expects to supply Mo-99 on a weekly basis to Lantheus Medical Imaging, Inc. After 2012, the contract provides for potential changes in pricing and volume commitments in the event of possible changes in the market.

Nordion's First Medical Isotope Sample Shipped from Russian Federation**January 03, 2011, SNM SmartBrief**

Nordion is set to receive its first batch of molybdenum-99 isotopes from Russian firm Isotope. The shipment, of which Nordion is not specifying the amount, will «help alleviate the impact of the planned NRU reactor shutdown currently intended for mid-May 2011.» Nordion said.

Nordion's Q1 shows shifting profile amid isotope supply concerns**March 23, 2011, SNM SmartBrief**

Nordion has expressed concern that the unstable isotope supply and problems with isotope-producing reactors could lead its previously strong client base to seek other isotope suppliers. Analyst Neil Maruoka, however, said that Nordion has the potential to remain a strong player in the isotope market, even as clients seek other suppliers, because of excess capacity at the National Research Universal reactor and possible backup supply from Russian partner Rosatom.

Covidien Receives FDA Approval for South African-Produced Medical Isotope Based on Low-Enriched Uranium**March 11, 2011, Competitor's Web Site**

Covidien announced that the U.S. FDA has approved the use of molybdenum-99 derived from low-enriched uranium in the production of technetium-99m generators.

Ottawa company expands its cancer-fighting technology**April 05, 2011, SNM SmartBrief**

Ontario will give Ottawa-based company Best Theratronics \$1.2 million for the production of medical isotopes. The company is planning to hire 100 workers as part of its expansion plans.

Eckert & Ziegler and Karlsruher Zyklotron AG form a strategic alliance for the production of medical radioisotopes**November 24,2010, Competitor's Web Site**

The co-operation with the Karlsruhe institution allows Eckert & Ziegler to more efficiently supply the south-western and southern regions of Germany and thus to further its production and sales network in Germany. Eckert & Ziegler also plans to expand its activities in adjacent territories, such as Poland.

Video: TRIUMF Medical Isotopes**February 28, 2011, Youtube****Video: Institut des Radioéléments****February 28, 2011, Youtube****REACTORS****NORTH AMERICA****Chalk up over \$100 million in costs for ditching nuclear reactors****November 22, 2010, Google alert**

The cancellation of the two MAPLE reactors and repairs for the National Research Universal reactor in Ontario have cost Atomic Energy of Canada Ltd. and the public more than \$100 million, according to the agency's 2010 annual report. The report also hinted that the NRU reactor could still be capable of operating even after its license expires in 2016.

Feds open to footing bill for isotope shortage - Willing to compensate provinces for costs of Chalk River reactor shutdown**December 03, 2010, Google alert**

Canadian Health Minister Leona Aglukkaq said the government is willing to cover the provinces' extra expenses during the period of medical isotope shortage when the Chalk River reactor was closed for 15 months for repairs. A spokesman for Ontario's health minister said the province will be asking for compensation once those costs are determined.

Rosatom to deliver Molybdenum-99 to Canada**December 12, 2010, SNM SmartBrief**

Russian firm Rosatom is preparing to deliver molybdenum-99 medical isotope to Canada as part of a 10-year deal. This is the first time that Russia will be exporting the isotope, which is produced at the Dimitrovgrad research center.

CNSC and Canadian Light Source Incorporated sign protocol for Isotope Supply Contribution Program**March 03, 2011, CNSC**

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Investment in nuclear centre at University of Saskatchewan paves the way for small reactor**March 03, 2011, Google alert**

The Canadian province of Saskatchewan will receive \$21 million in federal and provincial grants for the acquisition of its first PET/CT scanner as well as the construction of an advanced research cyclotron at the University of Saskatchewan. The \$17 million cyclotron would be used to produce radioisotopes for medical imaging while also aiding studies to improve medical technologies.

Medical isotopes at Sherbrooke University**January 21, 2011, Google alert**

The Centre hospitalier de l'Université de Sherbrooke (CHUS) will produce medical isotopes to reinforce the nuclear reactor at Chalk River.

NorthStar Medical Radioisotopes: Signs agreement with Missouri University to supply Molybdenum-99**March 03, 2011, SNM SmartBrief**

The University of Missouri Research Reactor has agreed to provide NorthStar Medical Radioisotopes with low specific activity molybdenum-99. The deal will allow NorthStar to increase its production of LSA molybdenum-99, which is produced without the use of uranium.

South Africa sends medical isotopes to US**December 21, 2010, Google alert**

The delivery to Lantheus Medical Imaging near Boston, Massachusetts, US, is the result of collaboration between the US National Nuclear Security Administration (NNSA) and the South Africa Nuclear Energy Corporation (Necsa), a state-owned company.

EUROPE**Production de radio-isotopes médicaux: redémarrage du réacteur Osiris [Production of medical radioisotopes: Restarting the reactor Osiris]****November 22, 2010, Google alert**

The Osiris reactor of CEA Saclay has restarted Thursday, November 18, after 5 months of work. Osiris ensures the supply of 5 to 7% of world production of technetium-99m, used in scans for the diagnosis of bone or cardiac diseases.

U.K. firm inches closer to isotope production, secures \$323K**February 15, 2011, Health Imaging**

Tokamak Solutions has received more than \$323,000 in contracts and investments towards the development of a super compact tokamak, a fusion neutron source, in part for the production of medical isotopes for the diagnosis and treatment of cancers.

Russia ready to provide Iran with medical isotopes**February 23, 2011, Google alert**

- Spokesman of Russian Atomic Energy Agency (Rosatom) said that Russia is ready to provide Iran with medical isotopes and sign an agreement in this concern.

HEALTH POLICY**FDA approves F-18 NaF for PET bone scans****February 04, 2011, AuntMinnie**

The U.S. Food and Drug Administration (FDA) has approved the use of F-18 sodium fluoride (NaF) for PET bone scans, according to the National Cancer Institute (NCI).

American Medical Isotopes Production Act**February 02, 2011, Google alert**

During a hearing before The Senate Energy and Natural Resources Committee, Sen. Lisa Murkowski raised the need for the United States to develop its domestic production of molybdenum-99, the parent isotope of technetium-99 (Tc-99m), used in 85 percent of the nuclear medical isotope procedures performed annually in this country. The legislation provides the Department of Energy \$143 million over three years. A similar bill was reported out of the Energy Committee unanimously last year.

IAEA secures medical isotope supply**January 12, 2011, SNM SmartBrief**

A coordinated research project initiated by the International Atomic Energy Agency in 2005, and which is scheduled to end this year, is helping member states to develop methods for the production of molybdenum-99 without using highly enriched uranium. More than half of the member states involved in the project are now using the methods beyond the laboratory setting, the agency said. «Looking ahead, hopefully the CRP will transition into an IAEA inter-regional technical cooperation project, in which proven molybdenum-99 production technology is deployed by member states,» said Ed Bradley, an IAEA nuclear engineer with the Research Reactor Section.

ASRT endorses Senate Mo-99 bill**February 28, 2011, AuntMinnie**

The American Society of Radiologic Technologists has expressed support for the American Medical Isotopes Production Act of 2011, a bill that promotes the domestic production of the radioisotope molybdenum-99 without the use of highly enriched uranium. The Senate Energy and Natural Resources Committee started the hearings on Senate Bill 99 on Feb. 1.

NNSA supports Mo-99 production bill**February 07, 2011, AuntMinnie**

The American Medical Isotopes Production Act of 2011 (HR 3276) would have Mo-99 suppliers worldwide use low-enriched uranium, rather than highly enriched uranium, with the goal of developing a reliable supply of Mo-99 for the U.S.

SNM lauds Mo-99 production bill**February 09, 2011, AuntMinnie**

The bill (S 99) is designed to establish a technology-neutral program to support the production of molybdenum-99 (Mo-99) for medical uses in the U.S. It calls for the U.S. to gradually reduce the export of highly enriched uranium for the production of medical isotopes over a period of seven years.

NEW TECHNOLOGIES**Isotope consortium receives \$4M in federal aid****January 25, 2011, Google alert**

Winnipeg consortium has been awarded \$4 million in support from the federal government to come up with alternative ways to produce medical isotopes. The Winnipeg group is one of four from across the country who received a total of \$35 million from the federal government to develop new ways to produce the most widely used isotope for medical imaging that's used in about 80 per cent of nuclear medicine diagnostic procedures.

Canada invests \$35M in Tc-99m production**January 26, 2011, AuntMinnie**

The Canadian government has allotted \$35 million in support of efforts of four groups to produce medical isotopes by April 2012 without using a nuclear reactor or highly enriched uranium. The country's TRIUMF laboratory in Vancouver, British Columbia, will be heading one of the teams. The other groups are based in Quebec, Saskatchewan and Richmond, British Columbia

Team aims to produce medical isotopes without nuclear reactor**January 26, 2011, Google alert**

Producing medical isotopes safely, cheaply and reliably without using a nuclear reactor or weapons-grade uranium is the aim of a research project led by the Canadian Light Source (CLS) along with the National Research Council of Canada (NRC), NorthStar Medical Radioisotopes and medical researchers from the University of Ottawa Heart Institute and Toronto's University Health Network. The team's preliminary calculations indicate that three facilities similar to the prototype to be built at the CLS would meet all of Canada's demand for technetium-99m.

How to Transmute Elements with Laser Light - A technique for triggering nuclear reactions with photons could revolutionise the production of medical radioisotopes, say physicists**February 24, 2011, Google alert**

The idea is to stimulate nuclear reactions using powerful laser beams. At a specific frequency, these beams cause a nucleus to resonate violently, triggering the nuclear reaction and effectively shaking it apart. And since almost all the photons trigger a reaction, this process can be close to 100 per cent efficient.

Development of Medical Isotope Production (Mo-99) by the Boiling Water Reactor (BWR)**November 17, 2010, Competitor's Web Site**

In the BWR method, Molybdenum-99 is generated by neutron irradiation of raw Molybdenum in an operating BWR. Hitachi GE has worked with GEH to develop and commercialize the BWR method in a few years. Moreover, participating in the Joint Meeting, Hitachi GE intends to study with related organizations the feasibility of providing Molybdenum-99 using some of operating BWRs for technetium pharmaceuticals production.

EXPERTS**Le Canada cherche de nouvelles voies d'obtention d'isotopes médicaux****Canada seeks new ways of obtaining medical isotopes****February 11, 2011, Le Monde**

There are two ways for the future production of molybdenum-99 : reactors amended or new, suitable for use of low-enriched uranium, or using the new linear accelerators or cyclotrons. The use of low-enriched uranium involves changing the entire production line, the marketing authorizations, safety cases, fuel management and waste: it will be very expensive, «said Guy Turquet Beauregard, vice president of European Association of Producers and suppliers of medical imaging (AIPES). The production using the new linear accelerators or cyclotrons is a research project. The current economic model is unsustainable. The main reactors are dying, they produce isotopes at a marginal cost which discourages private actors who turn them into drugs to grant investments as large as necessary.

Lessons Learned from the Moly Shortage**November 03, 2010, Health Imaging**

The nuclear medicine community learned many lessons from the shortage of molybdenum-99 (Mo-99), the mother radioisotope of technetium-99m (Tc-99m), during the recent shutdowns of the Canadian National Research Universal (NRU) reactor in Chalk River, Ontario, and High Flux Reactor (HFR) in Petten, the Netherlands. Both reactors are back online, but are nearing the end of their lifecycles. How is nuclear medicine positioned for the future?

SNM's Atcher lauds production of LEU-based molybdenum-99**December 10, 2010, SNM SmartBrief 20101210****Summary**

While the shipment of low-enriched, uranium-based molybdenum-99 to the U.S. does not immediately solve the isotope supply crisis, it shows that medical isotopes can be produced without employing weapons-grade uranium and presents a more secure source of the materials, said Robert Atcher, SNM past president and chairman of its Medical Isotope Task Force. The shipment of this LEU-based isotope also invalidates Iran's assertion that highly enriched uranium is required to produce medical isotopes, Atcher said

NEA: Medical isotope shortages could become commonplace

January 03, 2011, AuntMinnie 20110103

Summary

Supply shortages of molybdenum-99 could become commonplace over the next decade unless longer-term actions are taken. That is the main conclusion of a report from the Nuclear Energy Agency (NEA) of the Organization for Economic Cooperation and Development.

OECD nuclear chief hopes Ottawa will be 'flexible' on medical isotopes

February 28, 2011, Google alert

Canada should remain "flexible" and consider the global need for medical isotopes as the end date approaches for the Ontario reactor that produces much of the world's supply, the head of a major international nuclear agency says.

SCIENTIFIC PUBLICATIONS**Design of accelerator-based solutions to produce ⁹⁹Mo using lowly enriched uranium**

Frédéric Stichelbaut , Yves Jongen

Nuclear Medicine and Biology

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AIPES Executive Newsletter n°1

February 2011

The supply of medical isotopes - an assessment of the market economics, alternative technologies and proposed policy approach to achieving sustainability

By R. CAMERON, A. Y. LOKHOV, C. WESTMACOTT, OECD Nuclear Energy Agency, April 2011-04-20

At the request of its member countries, the OECD Nuclear Energy Agency (NEA) has become involved in global efforts to ensure a reliable supply of molybdenum-99 (⁹⁹Mo) and its decay product, technetium-99m (^{99m}Tc), the most widely used medical radioisotope. The NEA established the High-level Group on the Security of Supply of Medical Radioisotopes (HLG-MR). The NEA Secretariat and the HLG-MR have started to develop the policy approach and recommendations for governments, industry and other stakeholders that will outline the foundation for ensuring the long-term supply of ⁹⁹Mo/^{99m}Tc.

TECHNETIUM SUPPLY FORECAST

ISSUE, 2010-11

TECHNETIUM SUPPLY FORECAST**Key**

Secure supply all generators should be delivered according to order requirements.



Light disturbance of supply, generators could be delivered with up to one day less of calibration.



Strong disturbance of supply, generators could be delivered with 2 or 3 days less of calibration.



Critical disturbance of supply, generators could be delivered with 4 days less of calibration or delivery could be postponed.



Disclaimer: The forecast provided here is only tentative and reflects the information available at time of the publication. Actual supply could be higher or lower than documented due to unforeseeable changes in the supply conditions.

IBA Molecular.

Society of Nuclear Medicine.

European Association Of Nuclear Medicine.

Sociedad Espanola de Medicina Nuclear.

Société Française de Médecine Nucléaire.

Société Belge de Médecine Nucléaire.

Nederlandse Vereniging voor Nucleaire geneeskunde.

Associa Italiana di Medicina Nucleare ed Imaging Molecolare.

British Nuclear Medicine Society.

Deutsche Gesellschaft für Nuklearmedizin e.V.



IMAGEM

Educational and bibliographic platform on Molecular Imaging.



Molecular Life

Informational portal on Molecular Imaging (Italy)

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