

Background and Talking Points on questions raised by the U.S. National Academy of Sciences Report titled “*Molybdenum-99 for Medical Imaging*”

Background:

The Organisation for Economic Co-operation and Development’s Nuclear Energy Agency (OECD-NEA) has convened the High Level Group on the Security of Supply of Medical Radioisotopes (HLG-MR) since 2009. This international working group focuses on the reliability of supply of the medical isotope molybdenum-99 (Mo-99). The daughter product of Mo-99, technetium-99m, is used in approximately 80% of all nuclear medicine procedures, or about 100,000 procedures every day around the world. The properties of the isotope make it well-suited for medical scans but its short half-life makes the product impossible to stockpile. Today, Mo-99 is produced in a handful of existing isotope production facilities and is produced, in large part, with highly enriched uranium (HEU). The HLG-MR has been working to implement principles to encourage reliable, sustainable, commercial production of Mo-99 without the use of HEU.

Since 2010, the Government of Canada has signaled that it would cease production of Mo-99 from the NRU reactor beyond October 2016. In 2015, the Government of Canada affirmed that it would stop routine production from the NRU, but that the ability to produce Mo-99 would be maintained until March 2018 for emergency Mo-99 production in the event of a global shortage that could not otherwise be mitigated.

The OECD-NEA regularly reviews the global Mo-99 market demand and available production capacity and issued its most recent report in June 2016 titled *2016 Medical Isotope Supply Review: ⁹⁹Mo/^{99m}Tc Market Demand and Production Capacity Projection 2016-2021*. This report concluded that "Overall, the current irradiation and processor supply chain capacity should be sufficient and if well maintained, planned and scheduled, be able to manage an unplanned outage of a reactor, or a processor throughout the whole period to 2021."

Without the supply historically provided by Canada, the other current producers have sufficient production capacity available to meet patient needs and also cover limited, unscheduled maintenance outages. This is due, in part, to the recent increase in current production capacity from the facilities located in Australia, Belgium, the Czech Republic, and the Netherlands. Production capacity is expected to be further bolstered in the coming years through the expected introduction of new production facilities located in Australia, Europe, the United States, and elsewhere.

On September 12, 2016, the U.S. National Academies published a separate, independent report titled *Molybdenum-99 for Medical Imaging*, which, among other findings, states “The committee judges that there is a substantial (>50 percent) likelihood of severe molybdenum-99/technetium-99m supply shortages after October 2016, lasting at least until current global suppliers complete their planned capacity expansions.” The findings of the National Academies also indicate a similar period of increased risk to the Mo-99 supply, which is consistent with the findings of the 2016 OECD-NEA report.

While the cessation of production at the NRU reactor in Canada after October 2016 will lead to a period of increased risk to the Mo-99 supply chain, neither report indicates that Mo-99 shortages will occur and the HLG-MR is of the opinion that the industry will not be subjected to additional risks not previously identified.

Talking Points:

- The HLG-MR is in regular contact with the Association of Imaging Producers and Equipment Suppliers that co-ordinates the international scheduling of the availability of reactors that produce Mo-99 to help plan adequate capacity and minimise supply risks.
- The NRU reactor will cease regular Mo-99 production beyond October 2016, but the ability to produce Mo-99 will be maintained until March 2018 for emergency Mo-99 production in the event of a global shortage that could not otherwise be mitigated.
- Like the 2016 OECD Market Demand and Capacity Projection, the recent NAS report indicates some increase in risk to the Mo-99 supply chain once Canada ceases regular production.
- However, both reports cite steps that governments and major producers are taking to mitigate this risk, and neither report indicates that Mo-99 shortages will occur.

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