

CHAIRMAN'S SUMMARY

The 2013 Molybdenum-99 Topical Meeting was held on April 1-4, 2013 in Chicago, Illinois. This meeting was sponsored by the United States Department of Energy, National Nuclear Security Administration's Global Threat Reduction Initiative and organized by Argonne National Laboratory. Over four days, 137 participants from 11 countries attended the meeting along with the International Atomic Energy Agency (IAEA) and the Organization for Economic Cooperation and Development-Nuclear Energy Agency (OECD-NEA). The meeting included key public and private sector stakeholders involved in molybdenum-99 (Mo-99) and technetium-99m (Tc-99m) production and use.

Tc-99m, obtained from Mo-99, is the most commonly used medical radioisotope in the world. Annually, it is used in approximately 80% of all nuclear medicine diagnostic procedures performed globally, and 85-95% of it is produced with highly enriched uranium (HEU) targets. An estimated 40-50 kg of HEU is used each year for the production of 10,000 to 12,000 6-day Ci/week of Mo-99, primarily in Belgium, Canada, the Netherlands, Australia, and South Africa. Minimizing the use of HEU in civilian applications, including in the production of Mo-99, has long been a pillar of global nonproliferation policy. As a result of supply shortages and issues regarding coordination and communication about such shortages, there is now international consensus on the goal of developing an economically sustainable and reliable supply of Mo-99 produced without HEU as rapidly as possible.

At the time of the meeting, the current Mo-99 supply chain remains fragile. The HFR reactor in the Netherlands has been out of operation since November 2012 and will remain out of operation until at least May 2013, and the Canadian NRU reactor is expected to shut down for scheduled maintenance from mid-April to mid-May. Outage reserve capacity and skillful coordination by the industry has minimized the impact to the end-user to date, however near-term shortages remain a future risk.

The need for the Mo-99 production infrastructure to transition to a non-HEU-based, full-cost recovery model to ensure it functions as a sustainable, stable, and fully commercial market remains a top priority. The development and implementation of an economic model based on full-cost recovery, that can maintain a global production capacity sufficient to supply the needs of the medical community and transition away from government subsidies as rapidly as possible, continues to be one of the industry's most significant challenges.

The 2013 Mo-99 Topical Meeting served as a forum to discuss recent developments in the transition to full-cost recovery and the establishment of a reliable supply of Mo-99 produced without the use of HEU. The progress and challenges since the previous Mo-99 Topical Meeting in 2011 included:

Progress:

1. Coordination among the industry has taken place to avoid shortages during unscheduled shutdowns by using outage reserve capacity and other compensatory measures.
2. New international agreements, legislation, and government support have been introduced to help move the industry to a non-HEU based full cost recovery market.
3. New sources of LEU-produced Mo-99 have become available to the global market.
4. Progress has been made to develop new non-HEU technologies to produce Mo-99.
5. Progress has been made in the conversion of existing producers of Mo-99 to LEU targets.
6. The isotope production and nuclear explosion monitoring communities have shown a willingness to explore technical solutions for emissions monitoring and mitigation from fission-based isotope production.

Continued Challenges:

1. The unplanned and continued outage of the HFR reactor in the Netherlands highlights the continued fragility of the current Mo-99 supply chain.
2. Progress has been made on the implementation of the six OECD-NEA policy principles to support a long-term, reliable supply of Mo-99, but implementation is not yet universal and current economic practices remain unsustainable for the long-term.
3. Uptake of available LEU-based Mo-99 has been slow throughout the global markets. Utilization of the U.S. government's actions to support the uptake of LEU-based Mo-99 by users in the United States has also been limited so far.
4. The business cases and funding mechanisms for some of the new Mo-99 production technologies have not yet been fully established, and the technologies may not be commercially viable without an economically sustainable market.
5. In addition, there is an evident lack of a clear commitment by some new entrants to utilize full cost recovery and non-HEU technologies.

In this context, the 2013 Mo-99 Topical Meeting was useful for bringing together a wide range of stakeholders, providing an update on progress and experience, and continuing to consider new ideas and risks. This meeting fostered discussion that helped identify technical, economic, regulatory, and political challenges associated with establishing a reliable supply and transitioning to a non-HEU-based Mo-99 production regime, in line with international commitments to convert to LEU targets by 2015 as well as with the planned end of Mo-99 production at the NRU reactor in 2016. The supply chain remains fragile and industry and governments must not become complacent in their commitment to establish a reliable non-HEU-based supply chain. The attendees recognized that this is a global issue and that all stakeholders need to continue to actively and consistently pursue the long-term objective of establishing a reliable, full-cost recovery, non-HEU-based Mo-99 supply chain in order to meet medical patient needs.