CHAIRMAN'S SUMMARY

The 2011 Molybdenum-99 Topical Meeting was held on 4-7 December, 2011 in Santa Fe, New Mexico. This meeting was sponsored by the United States Department of Energy (U.S. DOE), National Nuclear Security Administration's (NNSA) Global Threat Reduction Initiative (GTRI). Over four days, more than 100 participants from 20 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 government and 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 of which 85-95% is produced via the use of highly enriched uranium (HEU) targets. It is estimated that 40-50 kg of HEU are used each year for the production of approximately 12,000 6-day Ci/week of Mo-99 in Canada, Europe, and South Africa. Minimization of 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 recurring supply shortages and consistent with this policy, an international consensus exists to develop an economically sustainable and reliable supply of Mo-99 produced without HEU as rapidly as possible.

Many different studies have been developed in recent years to address issues related to the fragile Mo-99 supply, the need for new non-HEU-based entrants into the Mo-99 supply chain, and the conversion of existing producers to use low enriched uranium (LEU) targets. One of the main recommendations of these studies is the need for the current Mo-99 production market to transition to full cost recovery to function as a sustainable, stable, fully commercial, non-HEU-based market. Presentations delivered during the meeting highlighted the significant increase in collaboration within the industry to achieve a secure and reliable supply of Mo-99 through existing producers' commitments to convert current production from HEU targets to LEU targets, new entrants' technical development of non-HEU production methods, and work being performed at the U.S. National Laboratories to support the non-HEU-based production of Mo-99 and the reduction of xenon emissions from current and future producers.

In recent years, large-scale Mo-99 production from LEU has been demonstrated commercially, validating that there are no scientific barriers for the conversion of Mo-99 production facilities from HEU to LEU. The most significant challenge identified is the development of a full cost recovery economic model that can maintain a global production capacity sufficient to supply the needs of the medical community while transitioning the market away from government subsidies as rapidly as possible.

Additional significant risks and opportunities to achieve a non-HEU-based, full cost recovery industry include:

1. Potential loss of government political support for, among others, innovation programs, LEU conversion programs and expeditious regulatory support actions to transition to a full cost recovery, non-HEU-based industry.
2. Uncertain reliability of ageing reactors and availability of HEU targets until new production can be implemented.
3. Continuation or use of subsidies for long-term, large-scale production which undermines both new entrants and the conversion of current producers to LEU targets.
4. The re-imbursement rate process for all markets requires further study, as it is related to the ability of the industry to move to a full cost recovery, non-HEU-based industry.
5. Securing, maintaining and, where appropriate, enforcing a global agreement of the appropriate actions that government, industry, and the medical community can take to support the difficult transition period from subsidized HEU-based industry to a full cost recovery, non-HEU-based industry.
6. Concern that transitioning to a full cost recovery, non-HEU-based industry could have unintended negative impacts to the medical community, resulting in less optimal outcomes for patients and medical practitioners if alternative isotopes are used. While some expressed concern for impacts this transition might have on reliability of supply, others argued that full cost recovery will result in greater supply reliability.

In this context, the Molybdenum-99 Topical Meeting was useful for bringing together a wide range of stakeholders, providing a mix of new ideas and experience. 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. Given the probability of another Mo-99 supply crisis occurring, industry and governments should not become complacent in their commitment to the establishment of a reliable non-HEU-based supply chain, especially during times of supply stability. The attendees recognized that this is a global issue and that all stakeholders need to continue to actively and consistently pursue goals to ensure that the Mo-99 supply chain is on a solid foundation for long-term reliability of supply through full-cost recovery and transition to non-HEU-based production.