



U.S. Department of Energy
Office of Inspector General
Office of Audits and Inspections

Audit Report

The Global Threat Reduction Initiative's Molybdenum-99 Program

OAS-L-12-07

July 2012



Department of Energy
Washington, DC 20585

July 20, 2012

**MEMORANDUM FOR THE ASSISTANT DEPUTY ADMINISTRATOR FOR GLOBAL
THREAT REDUCTION, NATIONAL NUCLEAR SECURITY
ADMINISTRATION**

A handwritten signature in dark ink, appearing to read "David Sedillo".

FROM: David Sedillo, Director
Western Audits Division
Office of Inspector General

SUBJECT: INFORMATION: Audit Report on "The Global Threat Reduction Initiative's Molybdenum-99 Program"

BACKGROUND

Molybdenum-99 (Mo-99) is used in the production of technetium-99m (Tc-99m), the most commonly used medical radioisotope in the world. The United States accounts for approximately half of the global demand for Mo-99 at approximately 6,000 units per week. Because Mo-99's short half-life of 66 hours prevents it from being stockpiled, consistent production is important to meet demand. Because the U.S. lacks a domestic production capability, its demand is met by other countries, whose processes have recently proven unreliable. In addition, the foreign producers utilize highly enriched uranium (HEU), a practice contrary to the National Nuclear Security Administration's (NNSA) Nuclear Security Goal of minimizing the use of HEU in civilian applications.

As a part of the Global Threat Reduction Initiative's (GTRI) Mo-99 Program, in Fiscal Years 2009 and 2010, NNSA entered into cooperative agreements (CA) with four commercial entities to accelerate the domestic production of Mo-99 without the use of HEU. Each CA has a potential value of \$25 million, and as of February 2012, NNSA had reimbursed the four CA partners a total of approximately \$6.7 million. GTRI's programmatic approach is to accelerate existing commercial projects to ensure that they can meet at least 100 percent of the U.S. demand of Mo-99 produced without HEU by the end of 2014. To maintain a steady supply without government subsidies, partners must utilize a full cost recovery economic model that permits the recovery of the full cost of production. Given the goal of minimizing the civilian use of HEU, along with the high domestic demand for Tc-99m, we initiated this audit to determine whether NNSA's GTRI Mo-99 program was on track to develop a reliable domestic production capability for Mo-99 by the end of 2014.

CONCLUSIONS AND OBSERVATIONS

Progress has been made in developing a reliable domestic production capability for Mo-99. For example, our review disclosed that as of January 2012, the CA partners had met established

milestones. Although one of the partners has indefinitely suspended operations and a second is not expected to meet the 2014 deadline, NNSA officials told us that program objectives can still be achieved by the remaining partners. Further, our tests did not reveal any material internal control weaknesses in selected areas of CA administration. Finally, while there are significant challenges to establishing a reliable domestic production capability for Mo-99, NNSA is aware of the challenges and is considering how best to address them.

Agreement Milestones

According to NNSA officials and Mo-99 program documentation, while Mo-99 production capability establishment efforts are still in the early stages as of January 2012, NNSA's four CA partners had achieved all of their milestones to date. In particular, initial activities including licensing, design and fabrication were successfully accomplished. However, we noted that not all of the CA partners will meet the remaining schedule. Specifically, in February 2012, one of the partners indefinitely suspended program operations after determining that its process was not financially competitive. Also, a second partner may not meet the production capacity goal until 2018 — more than 3 years after NNSA's programmatic goal of 2014, according to NNSA officials. In spite of this, NNSA officials told us that they are confident the other two CA partners will still achieve the production objectives. In fact, according to NNSA's program scheduling documentation, the partners are on track to meet the remaining milestones, including facility construction, equipment installation and full-scale production.

Internal Controls

We identified no material internal control weaknesses based on our limited testing of CA administration activities regarding *National Environmental Policy Act* (NEPA) requirements, reimbursement reviews and annual audits. We also noted that Federal oversight officials recognized potential issues and addressed them appropriately.

For example, CA partners have begun evaluations to determine the Mo-99 processes' effect on the environment. Specifically, in accordance with NEPA regulations, each of the CA partners submitted, or is preparing to submit, the documentation necessary for NEPA review. According to the CA terms, until such documentation is completed, cost reimbursement for the associated activities is prohibited. As such, we noted that the Federal Project Officer correctly identified and did not reimburse one of the CA partners when it erroneously submitted a reimbursement request for NEPA-related activities before the required documentation was complete.

In addition, we reviewed approximately \$3.3 million of the approximately \$6.7 million requested for reimbursement by the CA partners as of February 2012. The CA reimbursement requests we tested were supported with documentation such as invoices and receipts, and complied with applicable provisions of the *Energy Policy Act of 2005* (Act). Specifically, in accordance with the Act, NNSA reimburses up to 50 percent of total allowable costs on CAs, therefore reimbursement requests must specify the total Federal share and the non-Federal share for each cost claimed. Also, supporting documentation must be attached to each request. Each request that we reviewed appropriately stated the Federal and non-Federal shares and included the required documentation. In some cases, CA partners requested reimbursement for unallowable

costs or excluded activities as defined by the respective agreements. However, in each case the Federal Project Officer appropriately identified and denied these requests.

Finally, we determined that annual audits were conducted in accordance with the Code of Federal Regulations (CFR). Specifically, according to the Financial Assistance Rules found in 10 CFR 600, recipients of Federal awards must be audited by an independent auditor for each year in which they spend \$500,000 or more of award funding. In 2011, one CA partner's spending exceeded the limit, as did a second partner's in 2010 and 2011. In each case, an independent audit was conducted as required, with no significant findings identified.

Program Challenges

NNSA's CA partners have made progress toward developing a reliable domestic production capability for Mo-99, but challenges remain. According to industry experts, the most significant challenge is achievement of a full cost recovery economic model. To develop a domestic Mo-99 production capability that is sustainable for the long term, the CA partners must not rely on continued government financial support.

In addition, NNSA faces a number of secondary challenges. For example, the CA partner's success may be undermined by Mo-99 producers that receive subsidies from other countries. Further, the transition from HEU-based to non-HEU-based Mo-99 requires cooperation from government, industry and the medical community that may be difficult to obtain.

To address these challenges, NNSA, along with other Federal agencies, is considering incentives for the producers of non-HEU Mo-99. In addition, according to NNSA, the U.S. recently took part in an international four-party joint-statement to enhance cooperation for minimizing the use of HEU in Mo-99 production.

SUGGESTED ACTIONS

Development of a non-HEU-based Mo-99 production capability supports NNSA's mission to reduce nuclear materials located at civilian sites worldwide. As such, the program's success plays a vital role in achievement of NNSA's nonproliferation goal. In addition, this capability is needed so that the critical medical radioisotope Tc-99m will be available for the U.S. medical community. Therefore, we suggest that the Mo-99 Program Manager continue to:

1. Monitor each of the CA partners to ensure compliance with the respective CAs; and,
2. Develop viable mitigation strategies for the challenges noted in this report.

Because no recommendations are being made in this report, a formal response is not required. We appreciated the cooperation of your staff during the audit.

Attachment

cc: Deputy Secretary
Associate Deputy Secretary
Administrator, National Nuclear Security Administration
Chief of Staff

OBJECTIVE, SCOPE AND METHODOLOGY

OBJECTIVE

The objective of the audit was to determine whether the National Nuclear Security Administration's (NNSA) Global Threat Reduction Initiative (GTRI) Molybdenum-99 (Mo-99) Program was on track to develop a reliable domestic production capability for Mo-99.

SCOPE

The audit was performed between October 2011 and June 2012, at NNSA Headquarters in Washington, DC; Argonne National Laboratory in Argonne, IL; Oak Ridge National Laboratory in Oak Ridge, TN; and, NNSA's Albuquerque Complex in Albuquerque, NM. We also attended the Mo-99 Topical Meeting in Santa Fe, NM, and visited one of the Cooperative Agreement (CA) partners, located in Madison, WI.

METHODOLOGY

To accomplish the audit objective, we:

- Reviewed criteria regarding the management of CAs;
- Judgmentally selected a sample of CA reimbursement requests to review for adequate support and cost allowability;
- Evaluated the progress of each CA partner, including the status of *National Environmental Policy Act* submissions;
- Assessed internal and external risks to the production of Mo-99 and mitigation plans;
- Examined the CA deliverables being tracked by the Federal Program Managers; and,
- Reviewed prior audit reports on the CA partners and finding resolution, if applicable.

We conducted this performance audit in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our conclusions based on our audit objective. Accordingly, the audit included tests of controls and compliance with laws and regulations to the extent necessary to satisfy our objective. In particular, we assessed NNSA's implementation of the *GPRA Modernization Act of 2010* and concluded that it had established performance measures specifically for the

management of cooperative agreements for the domestic production capability of Mo-99. Measures were also established in the overall GTRI program area. Because our review was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We did not rely on computer-processed data to accomplish our audit objective.

NNSA waived an exit conference.

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