



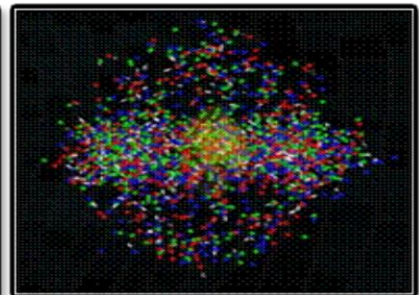
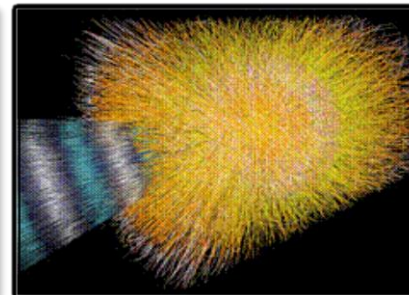
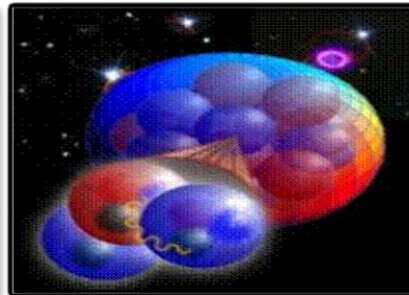
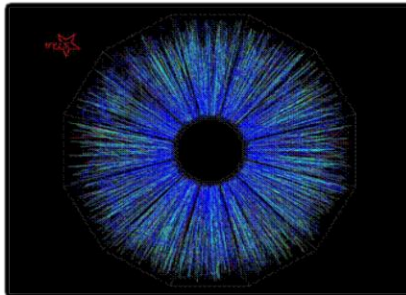
U.S. DEPARTMENT OF
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Office of
Science

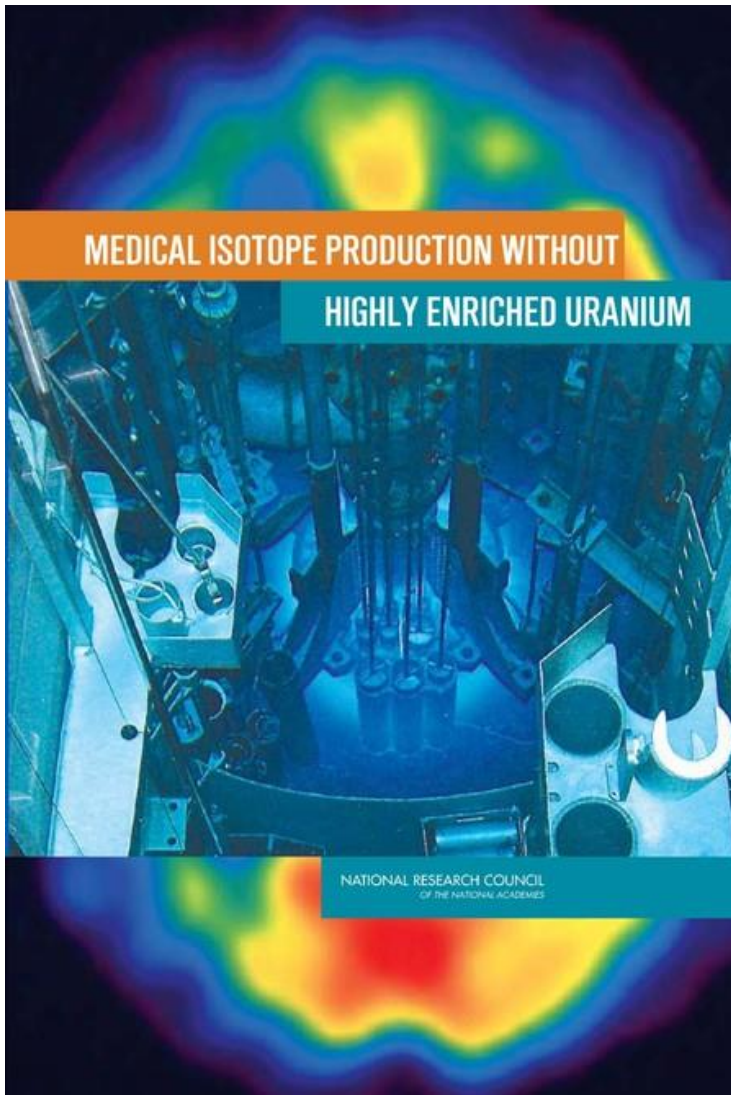
Charge to NSAC Related to NNSA Development of Mo99 Domestic Supply

Nuclear Science Advisory Committee Meeting
November 2, 2018

Dr. T. J. Hallman
Associate Director for Nuclear Physics
DOE Office of Science



The Importance and the Challenge of Mo-99 Production



The decay product of Mo-99, technetium-99m¹ (Tc-99m), is used in a very high percentage (~ 70%) of all diagnostic medical isotope procedures in the United States.

A very high percentage of Mo-99 is currently being produced using highly enriched uranium (HEU) targets which is a major concern

NRC Report 2009



The National Defense Authorization Act for FY2013

- **SEC. 3173. IMPROVING THE RELIABILITY OF DOMESTIC MEDICAL ISOTOPE SUPPLY.**
- (a) MEDICAL ISOTOPE DEVELOPMENT PROJECTS.—
- (1) IN GENERAL.—The Secretary shall carry out a technology-neutral program—
 - (A) to evaluate and support projects for the production in the United States, without the use of highly enriched uranium, of significant quantities of molybdenum-99 for medical uses;
 - (B) to be carried out in cooperation with non-Federal entities; and
 - (C) the costs of which shall be shared in accordance with section 988 of the Energy Policy Act of 2005 (42U.S.C. 16352).
- (2) CRITERIA.—Projects shall be evaluated against the following primary criteria:
 - (A) The length of time necessary for the proposed project to begin production of molybdenum-99 for medical uses within the United States.
 - (B) The capability of the proposed project to produce a significant percentage of United States demand for molybdenum-99 for medical uses.
 - (C) The capability of the proposed project to produce molybdenum-99 in a cost-effective manner.
 - (D) The cost of the proposed project.
- (3) EXEMPTION.—An existing reactor in the United States fueled with highly enriched uranium shall not be disqualified from the program if the Secretary determines that—
 - (A) there is no alternative nuclear reactor fuel, enriched in the isotope U–235 to less than 20 percent, that can be used in that reactor;
 - (B) the reactor operator has provided assurances that, whenever an alternative nuclear reactor fuel, enriched in the isotope U–235 to less than 20 percent, can be used in that reactor, it will use that alternative in lieu of highly enriched uranium; and
 - (C) the reactor operator has provided a current report on the status of its efforts to convert the reactor to an alternative nuclear reactor fuel enriched in the isotope U–235 to less than 20 percent, and an anticipated schedule for completion of conversion.



The National Defense Authorization Act for FY2013 and NSAC

(H. R. 4310— 581)

(4) PUBLIC PARTICIPATION AND REVIEW.—The Secretary shall—

(A) develop a program plan and annually update the program plan through public workshops; and

(B) use the Nuclear Science Advisory Committee to conduct annual reviews of the progress made in achieving the program goals and make recommendations to improve program effectiveness.



Charge to NSAC Related to NNSA Development of Mo-99 Domestic Supply

Professor David Hertzog
Chair, DOE/NSF Nuclear Science Advisory Committee
Department of Physics
University of Washington
Seattle, Washington 98195

Dear Professor Hertzog:

This letter is to request that, in accordance with direction given to the DOE in the National Defense Authorization Act (NDAA) for FY2013, the Nuclear Science Advisory Committee (NSAC) standing Subcommittee on Mo-99 conduct its annual assessment of the effectiveness of the National Nuclear Security Administration, Office of Material Management and Minimization (NNSA-MMM) Domestic Molybdenum-99 (Mo-99) Program (formerly known as the Global Threat Reduction Initiative).

The American Medical Isotopes Production Act of 2012 (Act), formerly known as S. 99 and H.R. 3276, was incorporated into the National Defense Authorization Act (NDAA) for FY2013. On January 2, 2013, President Obama signed the NDAA into law, enacting this legislation. A stipulation of the NDAA under section 3173 – *IMPROVING THE RELIABILITY OF DOMESTIC MEDICAL ISOTOPE SUPPLY* is that:

“...the Secretary [of Energy] shall...use the Nuclear Science Advisory Committee to conduct annual reviews of the progress made in achieving the [NNSA MMM] program goals and make recommendations to improve effectiveness.”

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The Department of Energy (DOE) and National Science Foundation (NSF) very much appreciate NSAC's four previous assessments as described in reports transmitted to the agencies on May 8, 2014, July 30, 2015, November 3, 2016, and March 19, 2018.

We request that NSAC reconvene the Subcommittee to provide a fifth annual assessment addressing the following charge elements:

- What is the current status of implementing the goals of the NNSA-MMM Mo-99 Program? What progress has been made since the 4th NSAC assessment?
- Is the strategy for continuing to implement the NNSA goals complete and feasible, within an international context?
- Are the risks identified in implementing those goals being appropriately managed?
- Has the NNSA-MMM Program addressed concerns and/or recommendations articulated in the 2017/2018 NSAC assessment of the Mo-99 Program appropriately and adequately?
- What steps should be taken to further improve NNSA program effectiveness in establishing a domestic supply of Mo-99?

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It is requested that this assessment be submitted by February 2019.

We are aware that this charge represents an additional burden on your time. However, the involvement of NSAC is essential to inform the Agency regarding the effectiveness of efforts to steward Mo-99, and isotope essential for the health and well-being of the Nation.

Sincerely,

J. Stephen Binkley
Deputy Director for Science Programs
Office of Science

Anne L. Kinney
Assistant Director, Directorate for
Mathematical and Physical Sciences
National Science Foundation