

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE AND TECHNOLOGY

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November 20, 2009

Mr. Gene L. Dodaro
Acting Comptroller General
U.S. Government Accountability Office
441 G Street, NW
Washington, D.C. 20548

Dear Mr. Dodaro:

The committee has recently become aware of a looming shortage of the gas helium-3 (He-3). This gas has a number of applications in private industry; it is used in well logging devices in the oil and gas industry, in MRI and other imaging technology in medical diagnostics, and in basic science research projects in such fields as nuclear and condensed matter physics. Much of the increased demand, however, is due to the expanded use of helium-3 in neutron detectors for national security, nonproliferation, and homeland security applications. The need for helium-3 in the United States is now greatly outpacing production.

Helium-3 is a by product of tritium production for use in nuclear weapons. Tritium, a radioactive gas, decays into helium-3, a non-radioactive isotope. Only the United States and Russia provide significant amounts of the gas. With the end of the Cold War, helium-3 production from tritium decay has been reduced significantly, declining as the nuclear weapons stockpile has been reduced due to a lowered need for tritium to maintain the stockpile. Since September 2001, however, the demand for He-3 has increased drastically due to security programs launched in the U.S. and other countries that rely on He-3 as a neutron detector in radiation monitors. This has led to a severe depletion of the existing He-3 stockpile and caused the present shortage. This shortage is expected to expand in future years and there are no existing alternatives that combine all of the capabilities of helium-3.

The Department of Energy (DOE), through its Isotope Development and Production for Research and Applications Program, has supplied isotopes and isotope-related services to the United States and other countries for more than 50 years. Since 2003, DOE has sold more than 175,000 liters of helium-3, drawing down a significant portion of the department's inventory. Russia is the only other country now providing significant amounts of helium-3, but their stocks too are rapidly diminishing. Projected demand for helium-3 is about 65,000 liters per year through 2013; helium-3 production in the United States and Russia is estimated to be only about

20,000 liters per year for FY 2010 and beyond. The result is that global production cannot meet our immediate needs, much less the anticipated expansion in worldwide demand.

Accordingly, a governmental interagency helium-3 Integrated Product Team (IPT) composed of the DOE, the National Nuclear Security Administration, the Department of Homeland Security, the Department of Defense, and other government agencies has been formed to address the decreasing supply. Discussions of this group include the pursuit of alternative technologies for neutron detection and finding alternative methods for production of helium-3. For those applications for which there is no alternative to He-3 the group has discussed the allocation of the existing He-3 supply.

Perhaps more than any other federal agency, the short-fall of He-3 will have a direct and negative impact on the Domestic Nuclear Detection Office (DNDO), a component of the Department of Homeland Security. DNDO was created in 2005. The agency's mission includes researching, developing, testing and acquiring radiation detection equipment for other federal agencies. DNDO's mission also includes the development of the global nuclear detection architecture, the enhancement of effective sharing and use of nuclear detection-related information and intelligence, and the coordination of nuclear detection research and development to continually improve detection capability. In addition, DNDO is supposed to conduct both evolutionary (near term, requirements-driven) and transformational (long term, high-payoff) research, development, test, and evaluation programs to improve the Nation's capabilities for detection, identification and reporting of radiological and nuclear materials.

Yet, the dwindling supply of He-3, upon which virtually all of DNDO's key missions depend, appears to have taken the agency by complete surprise. The Department of Energy, which has been in charge of the U.S. isotope development and production program, also appears to have not taken appropriate steps to help mitigate the impending He-3 supply crisis.

As this is a matter of great national concern, we would like GAO to begin a review of why the U.S. government did not respond to the He-3 supply issues sooner and the progress that the U.S. government is making toward resolving the problems associated with this increasing shortage of this vital resource. In conducting this work, I would like GAO to examine:

- (1) How and why were government agencies, including the Department of Energy, Department of Homeland Security and Domestic Nuclear Detection Office taken by surprise by the He-3 supply crisis?
- (2) What are the national security implications and challenges to industrial, medical, and research users of helium-3 posed by the increasing shortage?
- (3) What are the alternatives to the use of helium-3, if any? How feasible and cost-effective are these potential options and how quickly can they be realistically developed?
- (4) What steps is the U.S. government taking to address the challenges posed by the shortage of this critical resource, and what steps is it taking to study potential alternatives?

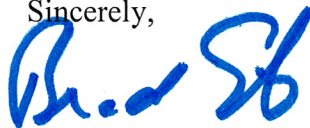
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- (5) What plans has the U.S. government made to manage the limited supply of helium-3, and which users and uses will receive priority access?

Furthermore, I recognize that additional questions may arise during this engagement, and I ask that GAO in consultation with the Subcommittee may refine the scope as appropriate. Thank you for your attention to this request. If you have any questions, please contact Douglas Pasternak, subcommittee professional staff member (202-226-8892) or Edith Holleman, subcommittee counsel (202-225-8459).

Your assistance in this matter is greatly appreciated.

Sincerely,



BRAD MILLER
Chairman
Subcommittee on Investigations & Oversight

CC: HON. PAUL BROUN
Ranking Member
Subcommittee on Investigations & Oversight