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MANAGING CRITICAL ISOTOPES

Weaknesses in DOE's Management of Helium-3 Delayed the Federal Response to a Critical Supply Shortage

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Highlights

Highlights of GAO-11-472, a report to congressional requesters

Why GAO Did This Study

Helium-3 gas is a key component of equipment used at ports and border crossings to detect radiation and prevent the smuggling of nuclear material into the United States, among other uses. The National Nuclear Security Administration (NNSA), a separate agency within the Department of Energy (DOE), extracts helium-3 and controls the inventory. Since 2003, NNSA has made helium-3 available for sale to DOE's Isotope Development and Production for Research and Applications Program (Isotope Program). After September 11, 2001, demand increased for radiation detection equipment, and in 2008, the federal government learned that it faced a severe domestic shortage of the gas. GAO was asked to review DOE's management of helium-3 to (1) determine the extent to which the federal government's response to the helium-3 shortage was affected by DOE's management of helium-3; (2) determine the federal government's priorities for allocating the limited supply of helium-3; and (3) describe the steps that the federal government is taking to increase the helium-3 supply and develop alternatives to helium-3. GAO reviewed DOE and NNSA documents and interviewed cognizant agency officials.

What GAO Recommends

GAO recommends, among other things, that DOE clarify whether the stewardship for those isotopes produced outside the Isotope Program, such as helium-3, rests with the program or another DOE entity. DOE stated that it understands and can implement these recommendations.

View GAO-11-472 for key components. For more information, contact Gene Aloise at (202) 512-3841 or aloisee@gao.gov, or Timothy M. Persons at (202) 512-6412 or personst@gao.gov.

What GAO Found

The federal government's awareness of and response to the helium-3 shortage was delayed because no DOE entity had stewardship responsibility for the overall management of helium-3—a by-product of the radioactive decay of tritium, a key component of the U.S. nuclear weapons program. Although the Isotope Program's mission includes selling isotopes and providing related isotope services, senior program officials said that they interpret this mission to exclude helium-3 and 16 other isotopes that the program sells but whose supply it does not control. As a result of this weakness in DOE's management of helium-3, officials at the Isotope Program and NNSA did not communicate about the helium-3 inventory or its extraction rate. According to NNSA and Isotope Program officials, they communicated with each other about how much helium-3 to sell each year and at what price but not about the size of the helium-3 inventory or extraction rate because NNSA generally treated this information as classified, due to concerns that the helium-3 inventory could be used to calculate the size of the U.S. tritium stockpile. NNSA and Isotope Program officials told GAO that this lack of communication contributed to the federal government's delayed response to the helium-3 shortage. The standards for internal control in the federal government state that information should be communicated to management and others within a time frame that enables them to carry out their responsibilities. Further, without stewardship by a DOE entity, key risks to managing helium-3, such as the lack of complete information on the production and inventory of helium-3, were not identified or mitigated. The federal standards for internal control state that management should assess the risks faced from external and internal sources and decide what actions to take to mitigate them.

Facing this critical shortage of helium-3, DOE and other federal agencies are collaborating to bring supply and demand into balance. Specifically, in July 2009, an interagency policy committee was formed, which halted allocations of helium-3 for domestic radiation detection equipment and established three priorities for allocating helium-3: (1) applications for which there are no alternatives to helium-3 have first priority (e.g., research that can be achieved only with helium-3); (2) programs for detecting nuclear material at foreign ports and borders have second priority; and (3) programs for which substantial costs have already been incurred have third priority (e.g., a DOE research facility that conducts physics research).

To increase the supply of helium-3, the federal government is, among other things, pursuing other sources and developing alternatives. Specifically, NNSA is in discussions with Ontario Power Generation (OPG), a power company in Ontario, Canada, to obtain helium-3 from its stores of tritium. OPG has accumulated tritium as a by-product of producing electricity using a type of nuclear reactor not found in the United States. Also, federal agencies and private companies are researching alternative technologies to replace helium-3 in several applications to decrease demand.