

September 2004

RUSSIAN NUCLEAR SUBMARINES

U.S. Participation in the Arctic Military Environmental Cooperation Program Needs Better Justification



G A O

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Why GAO Did This Study

Norway, Russia, the United Kingdom, and the United States participate in the Arctic Military Environmental Cooperation (AMEC) program, a multilateral effort that seeks to reduce the environmental impacts of Russia's military activities through technology development projects. AMEC has primarily focused on Russia's aging fleet of nuclear submarines. Section 324 of the National Defense Authorization Act for Fiscal Year 2004 required GAO to review AMEC, including its relationship to the Department of Defense's (DOD) Cooperative Threat Reduction (CTR) program. In accordance with the act, GAO (1) assessed the extent to which AMEC supports and complements the CTR program, (2) identified AMEC member countries' financial contributions to the program, (3) assessed AMEC's future program objectives, and (4) evaluated DOD's proposal to expand its technology development activities to Russia's Pacific region.

What GAO Recommends

GAO recommends, among other things, that DOD determine whether AMEC activities should include improving security around Russian nuclear submarine bases, and whether DOD's technology development efforts should be expanded to nuclear submarine dismantlement in Russia's Pacific region. DOD concurred with all of our recommendations.

www.gao.gov/cgi-bin/getrpt?GAO-04-924.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Gene Aloise at (202) 512-3841 or aloisee@gao.gov.

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What GAO Found

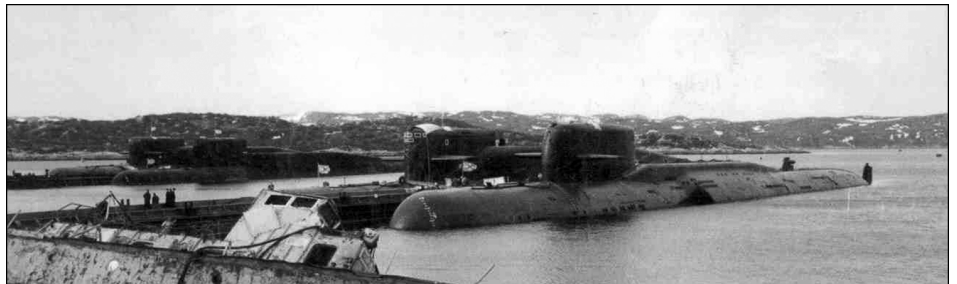
In a 1999 program plan to the Congress, DOD stated that AMEC projects would support the goals of the CTR program. However, we found that only one of eight AMEC projects designed to support CTR's objective of dismantling Russia's ballistic missile nuclear submarines has done so. This project involved development of a prototype 40-metric ton container to store and transport spent (used) nuclear fuel from Russia's dismantled submarines. Despite AMEC's limited contribution to CTR, DOD officials, including CTR representatives, said that most of the projects can be used to support dismantlement of other types of Russian nuclear submarines. In addition, U.S. and foreign officials cited other benefits of U.S. participation in AMEC, including promoting U.S. foreign policy objectives, particularly with Norway, and facilitating military-to-military cooperation with Russia.

From 1996, when the program was established, to April 2004, AMEC member countries had contributed about \$56 million to the program. The United States has been the largest contributor, providing about \$31 million, or about 56 percent of the total. However, the overall U.S. contribution has decreased from fiscal year 1999 to fiscal year 2004 as U.S. funded projects have been completed and as other AMEC member countries have increased their assistance.

In May 2004, AMEC developed a draft strategic plan to guide its future efforts. The plan, which is currently being reviewed by AMEC partners, proposes improving the security of Russia's nuclear submarine bases and securing spent nuclear fuel from dismantled submarines. However, securing bases could be contrary to U.S. policy, which preclude assistance to most operational Russian military sites that contain nuclear weapons, including certain naval facilities.

DOD wants to expand its dismantlement technology development efforts to Russia's Pacific region, but has not adequately analyzed the condition of Russia's decommissioned nuclear submarines in the Pacific and their impact on the environment. Furthermore, DOD has not identified specific projects that would be needed beyond those already done in the Arctic region.

Decommissioned Russian Nuclear Submarines



Source: DOD.

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Abbreviations

AMEC	Arctic Military Environmental Cooperation Program
CTR	Cooperative Threat Reduction Program
DOD	Department of Defense
DOE	Department of Energy
EPA	Environmental Protection Agency
G-8	Group of Eight

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United States Government Accountability Office
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September 9, 2004

Congressional Committees:

Prior to the collapse of the Soviet Union over a decade ago, little was known about the extent of contamination of the Arctic environment because of the secrecy of the former Soviet Union regarding its military activities in the area. However, in 1993, the Russian government released a report describing over three decades of Soviet-era dumping of radioactive waste in the ocean as well as radioactive contamination from nuclear submarine accidents. As a result, radioactive contamination and environmental concerns generated by the former Soviet Union's military presence in the Arctic region received increased attention from the international community, including the United States. Among the greatest concerns are the handling and storage of radioactive waste and spent (used) nuclear fuel from Russia's fleet of 249 ballistic missile and general purpose nuclear submarines.¹ This fleet includes at least 116 decommissioned nuclear submarines in the Arctic region and 76 decommissioned nuclear submarines in the Pacific region. Some of these decommissioned submarines are in poor condition, and one sank in 2003 off the coast of Norway as it was being towed to a shipyard in Russia for dismantlement. Figure 1 shows the submarine before it sank.

¹Nuclear submarines are powered by nuclear reactors that are encased in the hull. Russia's nuclear submarines include ballistic missile submarines that are designed to launch nuclear weapons, guided cruise missile submarines, torpedo attack submarines, and special mission purpose submarines. This report refers to all Russian nuclear submarines except for the ballistic missile submarines as general purpose submarines.

Figure 1: Russian Submarine That Sank in 2003



Source: The Bellona Foundation.

About 60 percent of Russia's decommissioned submarines still have spent nuclear fuel on board. Vast amounts of spent nuclear fuel—and liquid and solid radioactive waste from the submarines—are also being stored temporarily on special service ships and in coastal shipyards in Russia.²

While many of Russia's aging nuclear submarines present environmental problems, ballistic missile submarines also present a military and nuclear proliferation threat. The United States has been working with Russia since the mid-1990s to dismantle decommissioned Russian ballistic missile nuclear submarines through the Department of Defense's (DOD) Cooperative Threat Reduction program (CTR). Administered by DOD's Defense Threat Reduction Agency, CTR funds the dismantlement of

²The spent nuclear fuel accounts for 99 percent of the radioactivity from decommissioned nuclear submarines and requires special handling.

Russia's ballistic missile nuclear submarines to help Russia meet its commitments under arms reduction treaties with the United States. The United States does not consider Russia's general purpose nuclear submarines to be a military or nuclear proliferation threat and, consequently, does not fund their dismantlement.

As of March 2004, CTR had funded dismantlement of 27 Russian ballistic nuclear submarines, and CTR plans to partially dismantle up to an additional 15 submarines by 2013. Specifically, although CTR will continue to remove the spent fuel from the ballistic missile submarines' nuclear reactors, seal the reactors, and remove and eliminate the missile launcher compartments from all submarines that it dismantles, it will no longer fund the cutting up of the submarines' bows and sterns. DOD is turning over this part of the dismantlement process to Russia because, according to DOD, it does not directly contribute to threat reduction because the bows and sterns do not have a military value. CTR-funded dismantlement activities are taking place at four Russian shipyards—three in the Arctic region and one in the Pacific region.³

Figure 2 shows the location of CTR dismantlement sites and Russia's nuclear submarines.

³The process for submarine dismantlement and radioactive waste removal is extensive and complicated. It requires the removal of deckhouse enclosures and other detachable parts while the submarine is still afloat. Then the submarine's spent nuclear fuel is removed, and the reactor compartments are cut out and prepared for long-term storage. Most submarines have two reactors, each containing 180-280 fuel assemblies. The reactor compartments are sealed and buoyancy compartments are attached. This process creates liquid and solid radioactive waste. The missile compartment and bow and stern are removed and the remainder of the hull is recycled where feasible. According to a DOD official, the dismantlement process, including the transportation of the spent nuclear fuel, can take up to 18 months.

Figure 2: Location of CTR Dismantlement Sites and Russia's Nuclear Submarines



Source: Brookhaven National Laboratory and GAO.

Notes: Multiple nuclear submarines are located at the various sites.

CTR uses two additional shipyards in the vicinity of Severodvinsk for dismantlement purposes: Sevmash and Zvezdochka.

To help reduce the environmental impacts of Russia's military activities in the Arctic region, the United States, Norway, and Russia established the Arctic Military Environmental Cooperation program (AMEC) in 1996. The United Kingdom joined AMEC in 2003. Norway initiated AMEC and requested that the United States participate in the program to address what Norway perceived as significant environmental problems located on its border with Russia. Norway is one of the world's leading seafood exporters and was concerned that these problems would adversely affect its fishing industry.

AMEC has implemented its program primarily by funding projects to develop technologies to support the dismantlement of Russia's nuclear submarines. AMEC has focused on projects such as storing and

transporting radioactive waste from the submarines. The actual dismantlement of Russian submarines is being funded by a number of countries. In 2002, DOD requested congressional approval to expand its environmental technology development activities to Russia's Pacific region, but the Congress has not acted upon that request.

From AMEC's inception, U.S. participation has been hindered by the lack of liability protection.⁴ Without liability protection, the United States, its contractors, and their employees could be held financially responsible for an accident or incident that might occur while performing work on AMEC-funded projects in Russia. In the absence of liability protection for the AMEC program, the United States has, for the most part, tied its participation in AMEC projects to DOD's CTR program liability protocol: the CTR program has liability protection for all the work that it performs in Russia under an agreement signed in the early 1990s. In 1998, the Congress made \$5 million available to AMEC from CTR funds and directed DOD to include within AMEC "cooperative activities on environmental matters in the Arctic region with the military departments and agencies of other countries, including the Russian Federation."

Eight AMEC projects were identified by DOD and U.S. AMEC program officials as designed to be complementary and supportive of CTR program objectives. These projects have formed the core of U.S. participation in the AMEC program. An additional 11 projects have been implemented since the program's inception to support other AMEC objectives. (For a complete list of all AMEC projects, underway and completed, see app. I.) In response to §327 (c), the National Defense Authorization Act for Fiscal Year 1999, DOD submitted a plan to the Congress which, among other things, addressed the relationship of AMEC projects to the CTR program.

Section 324 of the National Defense Authorization Act for Fiscal Year 2004 required GAO to review AMEC, including the relationship of the program to DOD's CTR program. In accordance with the act, we (1) assessed the extent to which AMEC supports and complements the CTR program, (2) identified participating countries' financial contributions to AMEC,

⁴In 2003, several countries, including the United States, signed the Multilateral Nuclear Environmental Program in the Russian Federation, to facilitate the implementation of nuclear-related assistance programs with Russia. It was intended that this agreement would provide, among other things, liability protection to countries working with Russia. However, the United States has not signed the liability annex to the agreement because the United States is negotiating a separate liability agreement with Russia.

(3) assessed AMEC's future program objectives, and (4) evaluated DOD's proposal to expand its technology development activities to Russia's Pacific region.

To address these objectives, we obtained and analyzed AMEC program documents and met with AMEC members from Norway, Russia, the United Kingdom, and the United States. We also met with representatives from Japan to discuss their views about partnering with DOD on technology development activities in the Pacific. We obtained data on AMEC's mission, project implementation, and costs from DOD, the Department of Energy (DOE), the Department of State, and the Environmental Protection Agency (EPA). We also attended an AMEC meeting of the principals in April 2004 in Svalbard, Norway, at which high-level officials from each member country discussed program plans and project implementation. We also attended a separate meeting of AMEC technical representatives that focused on the development of a draft "strategic plan" to guide the program in the future. More details on our scope and methodology can be found in appendix II. We conducted our work from January through August 2004 in accordance with generally accepted government auditing standards.

Results in Brief

In a 1999 program plan to the Congress, DOD stated that AMEC projects would support the objectives of DOD's Cooperative Threat Reduction program. However, we found that only one of eight AMEC projects established to support and complement CTR's program for the dismantlement of Russia's ballistic missile nuclear submarines has directly benefited the CTR program. The one project involved development of a prototype 40-metric ton container to store and transport spent nuclear fuel from Russia's dismantled submarines. CTR officials told us that the containers met an immediate need for adequate storage space for the spent nuclear fuel removed from the dismantled submarines. With regard to the other seven AMEC projects, we found the following:

- One project, the development of a storage pad to hold the 40-metric ton nuclear fuel storage containers, was completed too late to support CTR's dismantlement efforts at a particular Russian shipyard. That shipyard had originally been designated as a dismantlement site for ballistic missile submarines, but by the time the pad was completed Russia had decided that it would no longer dismantle ballistic missile submarines at that site. This project cost about \$2.9 million.

-
- Two projects, involving development of technology to prevent corrosion inside the storage containers and a mobile facility to treat liquid radioactive wastes from dismantled nuclear submarines, were either terminated or suspended. The first project, for which U.S. expenditures totaled \$396,000, was terminated after CTR officials selected a U.S. contractor to develop the technology instead of working through AMEC. With regard to the second project, CTR determined that there was already adequate liquid radioactive waste treatment capacity at the facilities where submarines were being dismantled and therefore did not support the project. EPA, which managed the project, continues to hold about \$700,000 in project funds that were transferred from the Department of the Navy several years ago.
 - Two projects—developing treatment methods and steel storage containers for solid radioactive waste—were implemented at a mobile waste treatment facility located at a Russian shipyard where the CTR program is not dismantling Russian nuclear submarines. U.S. expenditures for these projects, including the waste treatment facility, totaled about \$12 million.
 - Finally, two projects—the development of a radiation detection system that will be used to protect the health and safety of workers who dismantle submarines and the provision of U.S. supplied dosimeters (radiation detection devices)—do not have a direct or immediate benefit to the CTR program. The radiation detection system, on which the United States spent \$1.7 million, is being implemented at a site where Russia decided to stop dismantling ballistic submarines. The U.S.-supplied dosimeters project was described as a failure by the AMEC project manager because the dosimeters did not meet Russian technical specifications and were not used for a couple of years. In July 2004, Russia’s representative to AMEC notified DOD that the dosimeters were now being used.

Despite AMEC’s limited contribution to the CTR program, U.S. and foreign officials said that U.S. participation in AMEC has achieved other benefits. In their view, AMEC plays an important role in promoting U.S. foreign policy interests. In particular, U.S. officials, including the Ambassador to Norway, told us that the U.S. relationship with Norway has been strengthened through AMEC. Norwegian ministry of defense and foreign affairs representatives agreed with this view. Furthermore, while most AMEC projects do not support dismantlement of Russia’s ballistic

submarines, U.S. officials, including CTR representatives, said the projects are supporting dismantlement of other types of nuclear submarines.

AMEC member countries had contributed about \$56 million to the program as of April 2004. The United States has been the largest contributor, providing about \$31 million, or about 56 percent of the total, since the program was established in 1996. Other countries' contributions are as follows: Russia about \$13 million; Norway about \$12 million; and the United Kingdom about \$100,000 since joining AMEC 1 year ago. DOD has provided over 90 percent of U.S. funds for AMEC. DOE and EPA have provided the remaining U.S. funds. U.S. contributions to AMEC have declined from 1999 to 2004 as U.S.-funded projects have been completed. According to U.S. officials, the United States plans to contribute about \$3 million annually from fiscal year 2006 to fiscal year 2011, the latest date for which projections have been made.

In May 2004, AMEC developed a draft strategic plan, which is currently being reviewed by AMEC partners, that proposes improving security at Russia's nuclear submarine bases, including developing technologies that will help secure, among other things, spent nuclear fuel and radioactive waste from Russia's decommissioned and dismantled nuclear submarines. AMEC's draft plan raises several concerns because it proposes (1) expanding AMEC's mission, (2) securing operational military bases that have nuclear weapons, including naval facilities, and (3) securing spent nuclear fuel from Russian submarines. Improving the security of Russian military bases may be contrary to U.S. policy and securing spent nuclear fuel from Russian submarines, according to DOE officials, is a low priority as a proliferation or radiological dispersion device (dirty bomb) threat compared with other radioactive sources, such as abandoned electrical generators containing large amounts of strontium-90. DOE officials told us that, based on available data, spent fuel from Russian submarines does not present a sufficiently high risk from a security perspective to warrant the commitment of resources. Irrespective of AMEC's proposed plans, U.S. participation in AMEC faces an uncertain future because the United States lacks liability protection for AMEC projects in Russia. The Department of State is seeking a U.S. governmentwide solution regarding liability issues with Russia but the matter has not been resolved. Consequently, the United States was only participating in a few projects, including (1) improving the safe towing of decommissioned nuclear submarines and (2) improving the buoyancy of decommissioned nuclear submarines.

Although DOD would like to establish a program similar to AMEC for Russia's Pacific region, DOD has neither adequately analyzed the condition of Russia's submarines in the Pacific and their impact on the environment nor identified specific projects that would be needed beyond those already being done in the Arctic. Furthermore, Japan, which plans to dismantle more than 25 Russian nuclear submarines in the Pacific, has no current plans to join with the United States in a technology development program.

This report makes recommendations to the Secretary of Defense to determine, in consultation with the Secretaries of Energy and State, whether AMEC's role should be expanded to include improving security around Russian nuclear submarine bases and to help ensure that U.S. participation in AMEC is consistent with overall U.S. nuclear nonproliferation efforts in Russia. The report also recommends that the Secretary of Defense assess whether DOD should expand its submarine dismantlement technology efforts to Russia's Pacific region and, if so, determine what form U.S. participation in such efforts would take. Furthermore, we recommend that the Administrator, EPA, determine, in consultation with the Secretary of the Navy, if the funds designated for AMEC's liquid waste project are still needed. If not, we recommend that the Administrator and the Secretary determine whether to reprogram the funds or to propose rescinding the funds.

We provided draft copies of this report to the Departments of Defense and Energy and EPA for their review and comment. DOE had no comments and EPA provided technical comments, which we incorporated as appropriate. In its written comments, DOD concurred with all of our recommendations. However, DOD raised some concerns, including AMEC's role and relationship to the CTR program and AMEC's impact on multinational programs, such as the G-8 Global Partnership initiative. We have addressed these matters in our evaluation of agency comments.

Background

AMEC provides a forum for Norway, Russia, the United States, and the United Kingdom to collaborate in addressing military-related environmental concerns in the Arctic region. The AMEC Declaration and "Terms of Reference" established the framework and organization for sharing information and technology and implementing projects. The Declaration focuses AMEC activities on radioactive and chemical contamination issues resulting from past military activities in the Arctic region and stresses cooperation between the military organizations.

AMEC's "Terms of Reference" establishes the organizational structure and possible ways of financing the AMEC program. It identifies representatives (principals) from each member country's respective department or ministry of defense. These representatives approve their countries' participation in AMEC activities and are responsible for obtaining resources from their respective governments to ensure that AMEC objectives are achieved. An AMEC steering group recommends specific projects to the representatives from each country, prioritizes approved work, provides project management, and determines which member country will take the lead on each project.

DOD's Deputy Undersecretary of Defense for Installations and Environment provides policy oversight for U.S. participation in AMEC. Within the United States, the Department of the Navy, which was named as the executive agent in 1998, manages the AMEC national program office. All contracting functions are managed by the Naval Facilities Engineering Command. Although DOD is the lead U.S. agency for AMEC, the Departments of Energy and State and EPA provide technical and policy support.

AMEC Projects Have Provided Limited Support for DOD's Cooperative Threat Reduction Program, but Projects May Be Useful for Other Purposes

In a 1999 program plan to the Congress, DOD stated that AMEC projects would support the goals of the CTR program. However, our analysis of these projects shows that only one of the eight projects established to support CTR objectives of dismantling Russia's ballistic missile nuclear submarines did so. The remaining seven projects were either completed too late, terminated or suspended, or implemented at shipyards or sites not directly associated with CTR's dismantlement program. Despite their limited impact on the CTR program, most of these projects can be used to support dismantlement of Russia's general purpose nuclear submarines, according to DOD officials. Furthermore, U.S. and foreign representatives asserted that AMEC has achieved other important benefits and that continued U.S. participation in the program is critical because the United States provides significant technical support.

One of Eight AMEC Projects Had a Direct Impact on CTR's Efforts to Dismantle Russia's Ballistic Nuclear Submarines

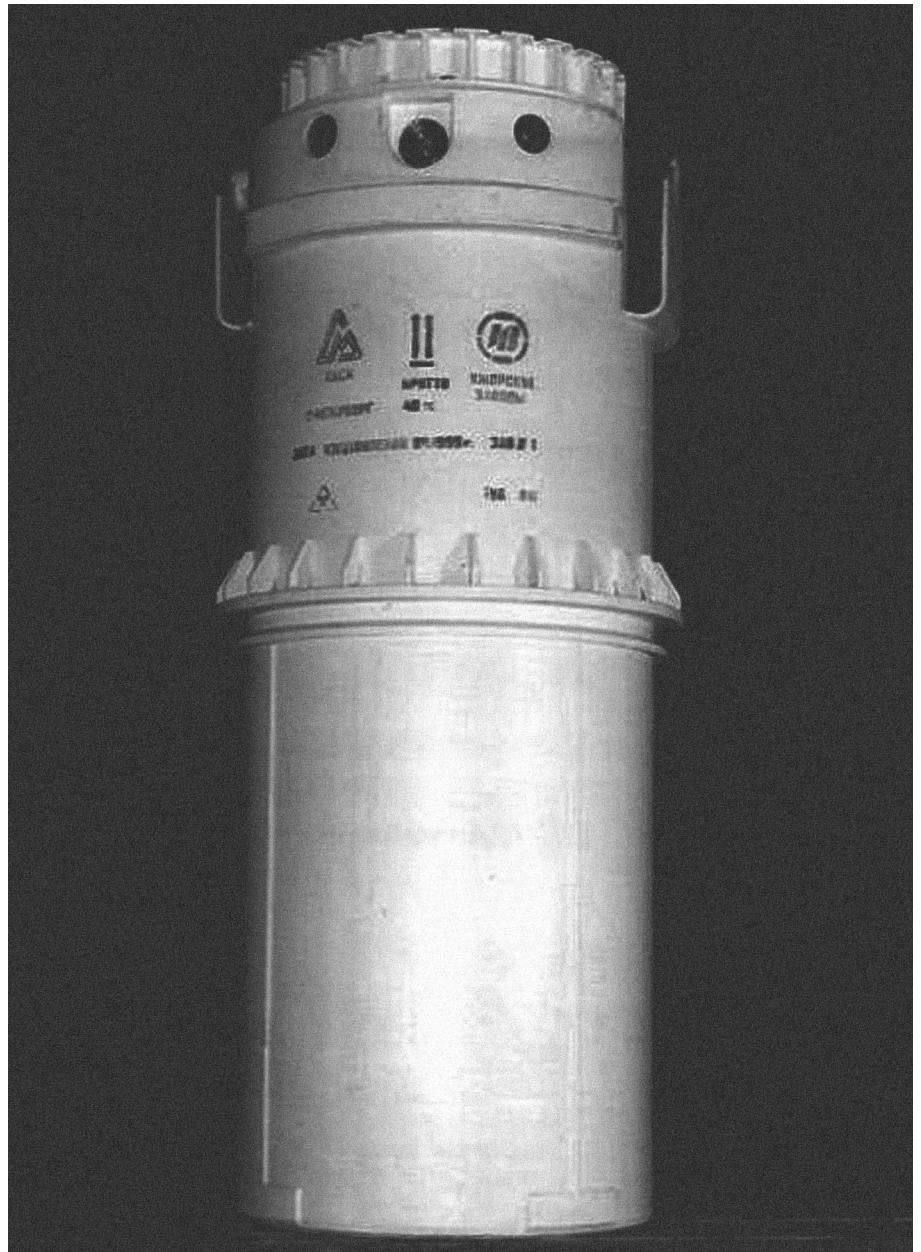
Only one of eight AMEC projects established to support and complement CTR's program for the dismantlement of Russia's ballistic missile nuclear submarines has directly benefited the program. According to a program plan that DOD submitted to the Congress in 1999, AMEC was being conducted in close cooperation with the CTR program so that the two

programs would benefit each other. The program plan stated that AMEC projects supported CTR submarine dismantlement activities. Some of the projects were expected to provide design and engineering support, while other projects were designed to fill gaps in the CTR program.

According to CTR officials, however, only one AMEC project, the development of a prototype 40-metric ton container used to store and transport spent nuclear fuel from dismantled Russian ballistic missile nuclear submarines, was able to meet CTR program objectives.⁵ U.S. expenditures for this project totaled about \$2.9 million, and the Navy chose EPA's Office of International Programs to manage the project. The containers helped solve an immediate problem—finding adequate storage capacity for the spent nuclear fuel removed from the submarines. CTR and EPA officials told us that the storage containers solved a “bottleneck,” enabling CTR to remove more spent fuel and facilitate dismantlement efforts. According to DOD and EPA, when serially produced the AMEC container costs 80 percent less than the cost of a Russian manufactured storage container. CTR has purchased 25 containers and plans to purchase an additional 35 to transport and store the spent fuel from dismantled ballistic nuclear submarines in Russia. Russia is also using the containers to store and transport spent nuclear fuel from general purpose nuclear submarines. Figure 3 shows an AMEC-designed storage container.

⁵The project covered the design, licensing, and construction of the prototype container. Certification of the container was delayed for about 2 years due to a jurisdictional dispute between Gosatomnadzor, the Russian civilian nuclear regulatory authority, and the military regulatory authority in Russia regarding the relative roles and responsibilities for transport and handling of the spent nuclear fuel using both military and civilian equipment.

Figure 3: AMEC-Designed Container Used to Store and Transport Spent Nuclear Fuel from Russia's Dismantled Nuclear Submarines



Source: EPA.

Regarding the other seven AMEC projects that were established to support or complement the CTR program, we found the following:

- A project, also managed by EPA, to develop a storage pad to hold the storage containers was completed too late to support CTR's dismantlement efforts associated with a Russian shipyard that had been used as a CTR dismantlement site.⁶ According to AMEC and EPA officials, the storage pad's completion was delayed due to problems identifying and obtaining all required Russian clearances and licenses to operate the storage pad; in the intervening time Russia decided it would no longer dismantle ballistic missile submarines at the shipyard. As a result, the storage pad is not used to support the CTR program but will be used for temporary storage of spent nuclear fuel from Russia's general purpose nuclear submarines. U.S. expenditures for this project totaled \$2.9 million.
- One project, involving development of technology to prevent corrosion inside the spent nuclear fuel storage containers, was terminated before completion because the CTR program withdrew its support and did not provide liability protection. In April 2002, CTR directed AMEC to develop and manufacture a spent nuclear fuel storage container dehydration system. The dehydration system was needed to extract water from the storage containers to inhibit corrosion and increase the containers' service life. However, in December 2003, the CTR program terminated AMEC's participation in the project and selected a U.S. contractor, instead of working through AMEC, to design a larger dehydration system.⁷ U.S. expenditures for this project totaled \$396,000.
- Two projects involving solid radioactive waste treatment and solid radioactive waste storage were implemented at a site where CTR is not dismantling ballistic missile nuclear submarines. These projects were designed to assist the Russian navy manage the large volume of waste

⁶The storage pad, which is located adjacent to the Nerpa shipyard, is being used to collect spent nuclear fuel from a variety of sites in northwest Russia. The shipyard, which has CTR-supplied equipment and infrastructure improvements, will also be available for the dismantlement of Russia's general purpose nuclear submarines.

⁷According to EPA, CTR subsequently canceled funding for the construction of the large dehydration facility after the design had been completed. EPA officials informed us that to their knowledge there is no dehydration system in Russia that meets western standards. Therefore, corrosion and chemical decomposition (hydrolysis) can occur over long-term storage of the containers with spent nuclear fuel.

generated by dismantlement of nuclear submarines. The waste treatment project identified, among other things, technologies that could reduce the volume of solid waste from decommissioned nuclear submarines and make it easier and more economical to store the material. The second project supported the development and production of 400 steel containers for the Russian navy to transport and store solid radioactive waste. Prior to the project, no Russian-designed and manufactured container had ever been certified to transport solid radioactive waste. According to the AMEC project manager, the projects introduced Russian representatives to western business practices, including improved contract management techniques. U.S. expenditures for these projects, which have been completed and consolidated at a mobile solid waste treatment facility built at a Russian shipyard, totaled about \$12 million, including the cost of the facility.

- AMEC's project to develop a demonstration radiation detection system to protect the health and safety of workers who dismantle submarines does not directly benefit the CTR program. The demonstration system is installed at the interim storage pad site, which is not being used to support the CTR program. U.S. AMEC and CTR officials were uncertain if the radiation detection system would be deployed at any of the CTR dismantlement sites in Russia. CTR officials said that while they support projects that protect workers' health and safety, they would not have funded this project and are uncertain how it promotes CTR dismantlement goals. U.S. expenditures for this project totaled \$1.7 million.
- A related project that supplied about 125 DOE surplus dosimeters (radiation detection devices) to the Russian navy was described as a failure by the AMEC project manager. He told us that the navy would not use these dosimeters due to, among other things, technical concerns and had put the equipment in storage for a couple of years. We brought this matter to the attention of a U.S. AMEC official who subsequently contacted the Russian AMEC representative and was informed that the dosimeters would be distributed. In July 2004, Russia's representative to AMEC notified DOD that the dosimeters were now being used.
- Finally, an AMEC project to develop a mobile liquid waste processing facility that could be used in remote locations in Russia was suspended because CTR did not support it. A CTR official told us that CTR never endorsed the project because adequate capacity for liquid radioactive waste treatment already existed at the facilities where submarines were

being dismantled. As a result, CTR would not extend liability protection for the project. EPA, which was chosen by the Department of the Navy to manage the project, still has about \$700,000 in unspent project funds that were transferred from the Navy beginning in 1999. EPA officials told us that the funds must be reprogrammed by December 31, 2004, unless the Navy provides an extension, or they will be returned to the U.S. Treasury.

U.S. AMEC officials told us that ultimately several of the projects that were established to meet CTR objectives did not do so because of changing requirements and plans. However, they asserted that the projects were planned with the full cooperation and approval of the CTR program and the appropriate Russian government agencies.

CTR officials told us they have no further need for AMEC assistance in carrying out their plans to continue dismantling Russian ballistic missile nuclear submarines until 2013. These officials asserted, however, that AMEC plays a useful role in helping address environmental issues and technology development and that this role should be continued. Although only one AMEC project that was established to support CTR did so, these officials believed that most of these projects can be used to support dismantlement of Russia's general purpose submarines. The storage pad, for example, can hold spent nuclear fuel from all types of Russian nuclear submarines and will facilitate the shipment of the fuel to the centralized storage facility at Mayak. Similarly, the steel containers for solid waste are already being used to store radioactive waste from dismantled general purpose submarines, according to U.S. and Russian officials. A DOE official told us that Russia also plans to use the steel containers to store waste from older ballistic missile submarines that are not scheduled to be dismantled with CTR assistance. Figure 4 shows the storage pad, and figure 5 depicts the solid waste steel containers funded by AMEC.

Figure 4: Interim Storage Pad



Source: DOE/Oak Ridge National Laboratory.

Note: A storage container is being loaded into one of the pad's cells.

Figure 5: Steel Containers Used to Store Solid Radioactive Waste from Dismantled Submarines



Source: DOD.

U.S. and Foreign Officials Believe That AMEC Has Benefits Beyond Projects Supporting CTR

Despite AMEC's limited impact on the CTR program, U.S. and foreign officials told us that AMEC has achieved other benefits as well and that continued U.S. participation in the program is critical. DOD and Department of State officials said that one of AMEC's most important benefits is promoting U.S. foreign policy objectives, particularly with Norway, a long-standing NATO ally, and with other nations in the Arctic region. The U.S. Ambassador to Norway told us that while AMEC is a very modest program in terms of expenditures, Norway views it as (1) a critically important part of the U.S.-Norwegian bilateral relationship, and (2) an effective multilateral effort to address one of its primary policy concerns—environmental protection in the Barents Sea region. The participation of the United States and the United Kingdom gives Norway political clout and technical expertise that Norway would not have working on a bilateral basis with Russia. Norwegian officials from the ministry of defense and ministry of foreign affairs reinforced these views. The U.S.

Ambassador to Russia also gave us his views about AMEC. In a May 24, 2004, letter to GAO, he noted that AMEC's accomplishments include the construction of the solid waste treatment and storage facility where there are a large number of Russian nuclear submarines awaiting dismantlement. Furthermore, he recommended that the United States continue to participate in AMEC and consider expanding the program to Russia's Pacific fleet.

U.S. and foreign officials also asserted that another important aspect of AMEC is that it facilitates military-to-military cooperation with Russia. Officials noted that AMEC has enabled military personnel from the United States, Norway, and United Kingdom to visit Russian naval facilities that they had previously been unable to visit. According to these officials, access to the facilities enables AMEC to better understand the environmental conditions and technologies required to assist with dismantlement efforts. Russia's AMEC representative told us that AMEC is a useful way to improve communications among the member countries' military organizations. He also noted, however, that Russia would find other ways to promote cooperation on environmental security issues if AMEC did not exist.

DOE officials told us that AMEC has produced tangible benefits in its efforts to plan an emergency exercise in the Murmansk region in late 2004. The exercise, which will be conducted as an AMEC project, entails staging an accident involving spent nuclear fuel from a Russian nuclear submarine. Participants in the exercise will include representatives from the Russian navy and emergency responders from various Russian organizations, including the Federal Agency for Atomic Energy, Ministry of Defense, and the Institute for Nuclear Safety. In addition, nuclear emergency management personnel from neighboring countries as well as the International Atomic Energy Agency are expected to participate. According to DOE officials, this exercise will be the first time that DOE can simulate an accident involving spent nuclear fuel from a Russian submarine.

AMEC Member Countries Have Contributed About \$56 Million to the Program

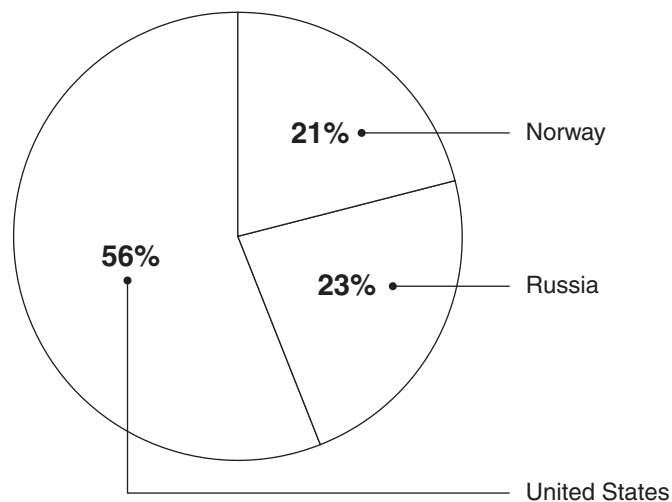
From 1996 to April 2004, AMEC member countries contributed about \$56 million to the program. The United States has been the largest contributor, providing about \$31 million or about 56 percent of the total, with Russia, Norway, and the United Kingdom contributing the remainder. Within the U.S. government, although DOD has provided over 90 percent of all funds, DOE and EPA have also contributed. U.S. contributions have declined from 1999 to 2004 as U.S.-funded projects have been completed and as other

member countries increased their contributions. According to DOD officials, U.S. contributions to AMEC are planned to be about \$3 million per year from fiscal year 2006 to fiscal year 2011.

The United States Has Been the Leading Contributor to AMEC, Providing More Than One-Half of Total Program Funds

From 1996 until April 2004, AMEC member countries contributed about \$56 million to the program. Figure 6 provides a breakout of AMEC members' contributions.

Figure 6: Contributions of AMEC Member Countries, as of April 2004



Source: DOD.

Note: The United Kingdom contribution accounts for less than 1 percent of total AMEC contributions.

As figure 6 shows, the United States has contributed the greatest amount of any AMEC member country—about 56 percent of the total. According to available data, Russia contributed about \$13 million; Norway contributed about \$12 million; and the United Kingdom provided about \$100,000 because it only recently joined AMEC.

Norway's contributions were initially limited because it did not have an agreement with Russia that provided liability protection for the Norwegian government or its contractors who would be providing assistance through AMEC. In May 1998, Norway signed an agreement with Russia that included liability protection, and since then Norway has contributed funds to several projects, including the development of a radiation detection

system and steel storage containers for solid radioactive waste. Norway plans to contribute an additional \$8 million to AMEC over the next few years, and Norwegian officials told us that they are committed to an equitable sharing of costs with the other AMEC member countries.

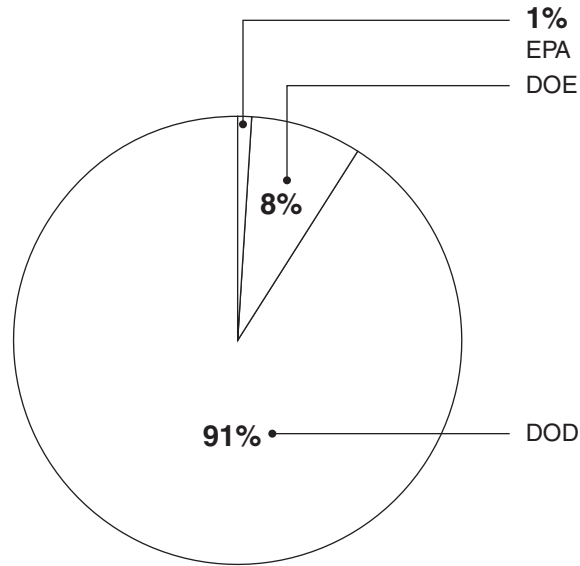
Russia's contributions to AMEC were used to support, among other things, development of the storage container for spent nuclear fuel, the interim storage pad, and the solid waste treatment and storage technologies. A U.S. AMEC official told us that he reviewed Russia's itemized list of project costs and was satisfied that the costs were a fair representation of Russia's financial contributions. However, Russia's future contributions are uncertain. A Russian representative to AMEC told us that Russia will continue to contribute financially to projects but noted that there are limited resources available. Other member countries told us that Russia would probably make mostly "in kind" contributions to the program, including labor and materials for specific projects.

The United Kingdom, which joined AMEC in June 2003, has contributed about \$100,000 for preliminary planning related to projects focusing on buoyancy and the safe towing of nuclear submarines. The United Kingdom has pledged an initial contribution of \$9 million to AMEC in order to fund a preliminary group of projects.

DOD Has Provided the Majority of U.S. Funds to AMEC

DOD has provided the majority of U.S. funding to AMEC—about \$28 million, or 91 percent of the total U.S. contribution. DOE and EPA have provided the remaining funds, about \$2.6 million and \$200,000, respectively. Figure 7 depicts the breakdown of U.S. funds for AMEC by each agency.

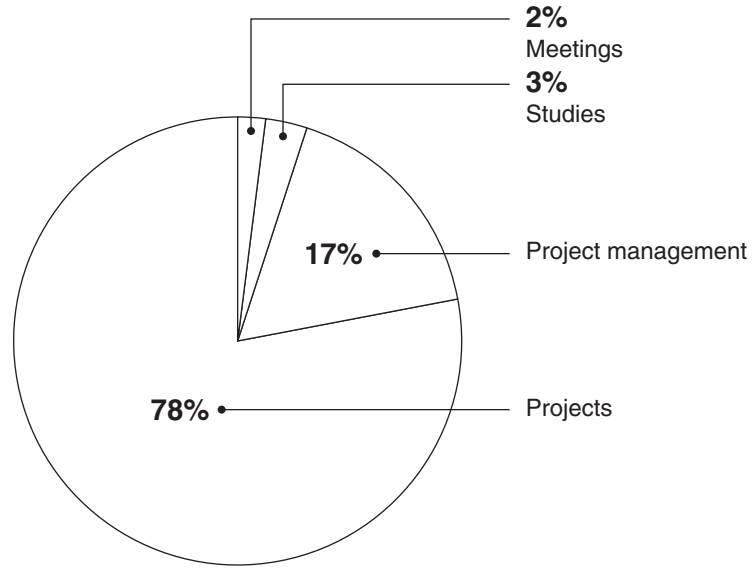
Figure 7: U.S. Agencies' Contributions to AMEC as of April 2004



Source: DOD.

U.S. funds have been used to support a variety of AMEC activities. About \$24 million of the U.S. contributions to AMEC were used to fund projects, such as the storage container for spent nuclear fuel from ballistic missile submarines and the storage pad. The remainder funded program management (about \$5.4 million), studies (about \$1.0 million), and meetings (about \$0.5 million). Figure 8 provides a breakdown of these amounts.

Figure 8: U.S. AMEC Program Costs by Category

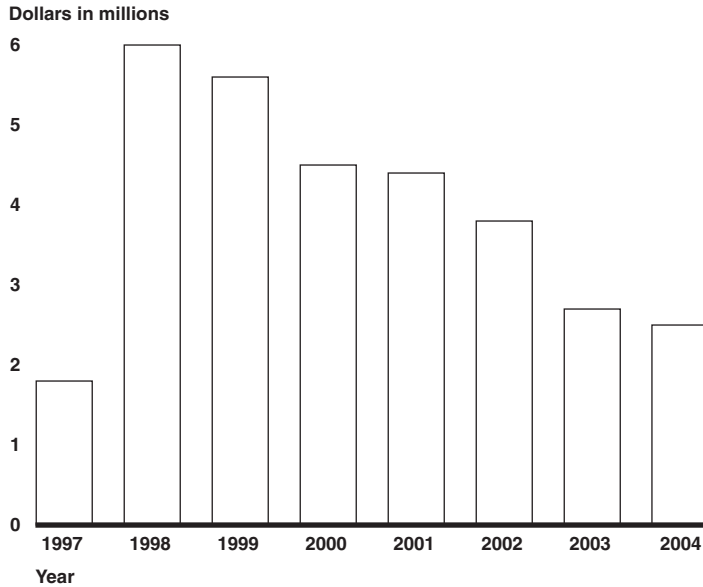


Source: DOD.

U.S. Program Contributions to AMEC Have Declined

The overall U.S. contribution to AMEC decreased from fiscal year 1999 to fiscal year 2004, as U.S.-funded projects have been completed and as other AMEC member countries have increased their assistance. During the period when U.S. contributions started to decline, Norway and Russia increased their contributions. As figure 9 shows, U.S. funding peaked at almost \$6 million in fiscal year 1998 when large scale projects such as the spent nuclear fuel storage container and storage pad were moving into implementation. Since fiscal year 2001, U.S. contributions have steadily declined and in fiscal year 2004, DOD allocated \$2.5 million to AMEC.

Figure 9: U.S. Funding Levels for AMEC, Fiscal Years 1997-2004



Source: DOD.

AMEC program officials stated that in the future, member countries expect to share equally in AMEC project costs. U.S. AMEC officials stated that U.S. annual assistance to AMEC will be \$3 million annually from fiscal year 2006 to fiscal year 2011, the latest date for which projections have been made. This projection was based on prior years' contributions as well as matching other members' planned contributions.

AMEC Plans to Significantly Expand Its Role and Redirect Its Focus to Include Nuclear Security Issues

AMEC's draft strategic plan, which is currently being reviewed by AMEC partners, envisions helping to secure Russian submarines, submarine bases, shipyards, and spent nuclear fuel and represents a significant expansion and redirection of AMEC's objectives. AMEC's proposal to improve submarine base security may be contrary to U.S. policy. In addition, according to DOE officials, spent fuel from Russian submarines is a low priority as a nuclear proliferation threat compared to other radioactive sources, such as abandoned electrical generators containing large amounts of strontium-90. Regardless of AMEC's plans, U.S. participation in AMEC faces an uncertain future because the United States lacks liability protection to participate in AMEC projects in Russia.

AMEC Plans to Expand Its Role into Securing Nuclear Materials from Russian Submarines

In May 2004, AMEC developed a draft strategic plan to guide its future efforts through 2015 that represents a significant expansion and redirection of its program. According to the draft plan, recent world events demonstrate the need to focus on emerging issues related to safety and security, with an emphasis on nuclear nonproliferation, nuclear threat reduction, and environmental sustainability. The draft plan states that spent nuclear fuel and other radioactive wastes generated during dismantlement of Russia's nuclear submarines are unprotected, presenting a significant proliferation risk. As a result, AMEC proposes giving priority to projects that will help secure spent nuclear fuel and other material that presents a radiological hazard and proposes addressing security problems at Russian shipyards, naval bases, support vessels, and other facilities associated with the dismantlement process. AMEC's draft plan calls for focusing on the following program areas:

- nuclear security issues in support of the Group of Eight (G-8) Global Partnership priorities;
- nuclear submarine dismantlement;
- management of hazardous waste generated as a result of military activities; and
- environmental sustainability, safety, and security of military activities and installations.

According to AMEC officials, AMEC's future direction will be closely aligned with the priorities established by the G-8 Global Partnership plan to combat the spread of weapons and materials of mass destruction. In 2002, the G-8 announced this new initiative. The United States and the other G-8 members— Canada, France, Germany, Italy, Japan, Russia, and the United Kingdom plus the European Union—pledged \$20 billion over the next 10 years to fund nonproliferation activities in the former Soviet Union. One of the key areas identified by the G-8 is nuclear submarine dismantlement. All of the G-8 countries, according to the Department of State, are contributing to the dismantlement of Russia's decommissioned general purpose nuclear submarines. Other non-G-8 Global Partnership countries are also

participating in this effort.⁸ AMEC program partners—the United Kingdom and Norway—have declared that they intend to use the AMEC program as one means of fulfilling their G-8 Global Partnership obligations. According to AMEC officials, future project development should include ways to reduce the security risks posed by all types of Russian nuclear submarines.

With the G-8 priorities in mind, AMEC’s nuclear security working group, which helped develop the draft strategic plan, proposed several areas of possible engagement, including:

- evaluating state-of-the-art technology to enhance security at Russian naval bases and shipyards,
- improving security of ships known as “service vessels” that are used to store spent nuclear fuel from dismantled nuclear submarines,
- consolidating radiological sources to improve their security, and
- coordinating and increasing security of fueled submarines in transit.

Regarding the security of Russian naval bases, the working group proposed evaluating, among other things, whether radar systems designed to detect low-profile targets, sonar systems designed to detect subsurface threats, and systems designed to detect small quantities of nuclear materials would improve security. AMEC technical staff would then develop recommendations and present them to AMEC’s representatives for consideration as follow-on projects. To improve the security of service vessels, the working group proposed incorporating protective measures, including radiation detectors, motion detectors, and closed circuit televisions. The working group also suggested reviewing a Russian study that focuses on consolidating radiological sources at several facilities. Based on this review, AMEC may suggest additional technical areas to be included in the study to improve its usefulness as a way to improve security. Finally, the working group proposed training personnel and developing procedures to produce a vulnerability assessment for, among other things, bases, shipyards, and radioactive waste storage facilities.

⁸Australia, Denmark, Finland, the Netherlands, Norway, and Sweden are also engaged in this area through supporting nuclear and environmental work in northwest Russia, or, in the case of Norway, through direct funding of the dismantlement of submarines. Australia, which joined the G-8 Global Partnership in 2004, plans to work with Japan to support the dismantling of general purpose submarines in the Pacific region.

AMEC's Draft Plan Has Not Been Coordinated with DOE and DOD Nuclear Nonproliferation Offices

To date, AMEC's draft plan to address security issues associated with Russia's nuclear submarines and support facilities has not been coordinated with DOD's CTR policy office, DOD's Office of Nonproliferation Policy, or DOE's National Nuclear Security Administration—the organization primarily responsible for securing nuclear materials in Russia.⁹ U.S. AMEC officials told us that coordinating AMEC's draft plan with other U.S. government agencies at an earlier stage would have been useful because of the program's planned expansion to include nuclear security. The draft plan was developed by an AMEC technical guidance group and is now being reviewed by AMEC representatives from the United Kingdom, Norway, and Russia. According to DOD, the next step will be to meet with AMEC partners in September 2004 to finalize their comments and to review project proposals. U.S. AMEC plans to submit the final draft of the strategic plan to the U.S. interagency coordination process later in 2004. Once the interagency coordination is completed, the plan will go to the representatives of the AMEC partners for final approval.

A DOD Nonproliferation Policy official told us that he had not seen AMEC's draft strategic plan. According to a CTR policy official, many of the proposed areas of engagement identified by the nuclear security working group were unnecessary because they would apply to protecting fuel within nuclear submarines, which is less vulnerable to theft or diversion. In addition, he noted that one proposed engagement—the review of security measures for Russian naval bases and shipyards— could be contrary to U.S. interagency guidelines established in 2003 that preclude the delivery of security-related assistance to most operational military sites in Russia that have nuclear weapons, including certain navy facilities. For example, the U.S. policy precludes assistance for improving security at operational sites where submarines loaded with nuclear weapons are docked.¹⁰

DOE officials from the National Nuclear Security Administration, who are primarily responsible for securing nuclear material in Russia, expressed concerns about AMEC's proposed expansion to include nuclear security.

⁹The National Nuclear Security Administration is a separately organized agency within DOE that was created in October 1999 with responsibility for the nation's nuclear weapons, nonproliferation, and naval reactors programs.

¹⁰For more information on this issue, see GAO, *Weapons of Mass Destruction: Additional Russian Cooperation Needed to Facilitate U.S. Efforts to Improve Security at Russian Sites*, [GAO-03-482](#) (Washington, D.C.: Mar. 24, 2003).

These officials, which included the Director of the Office of Global Radiological Threat Reduction, told us that securing spent nuclear fuel from dismantled Russian nuclear submarines is a low priority, based on available information.¹¹ DOE takes a risk-based approach to threat reduction by considering the quantity, form, transportability, and surrounding security threats posed by high-risk radiological materials. Based on these criteria, DOE has concluded that spent fuel from Russian submarines does not present a sufficiently high risk to warrant the commitment of resources. Rather, DOE places a higher priority on the highest-risk radiological materials, such as sealed radiological sources found in radioisotope thermo-electric generators, which contain strontium-90; blood irradiators; sterilization facilities; and large radiological storage locations.¹² As a result, DOE officials stated that DOE does not wish to participate in securing spent nuclear fuel.

DOE is funding a study that will prepare site-specific analyses of spent nuclear fuel inventories and terrorism vulnerability assessments for Russian nuclear submarine dismantlement sites. This study is expected to be complete in September 2004. The Director of the Office of Global Radiological Threat Reduction told us that DOE would use the information from the study to further evaluate the risks posed by spent nuclear fuel. He asserted, however, that securing spent nuclear fuel from nuclear submarines is primarily an environmental issue—not a proliferation concern. Furthermore, he stated that AMEC’s proposed nuclear security plan, if implemented, could have significant policy implications for all U.S. nonproliferation programs. For example, countries, including Russia, could request DOE assistance for securing spent nuclear fuel from dismantled nuclear submarines. If DOE agreed to provide this assistance, its resource requirements could dramatically increase because of the amount of spent nuclear fuel in the submarines and at coastal storage facilities.

¹¹DOE’s Office of Global Radiological Threat Reduction’s mission is to reduce the threat posed by high-risk radiological materials that could be used in a dirty bomb by identifying and securing such materials on a worldwide basis.

¹²For more information, see GAO, *Nuclear Nonproliferation: U.S. and International Assistance Efforts to Control Sealed Radioactive Sources Need Strengthening*, [GAO-03-638](#) (Washington, D.C.: May 16, 2003).

Future U.S. Participation in AMEC Is Hampered by Lack of Liability Protection

Regardless of AMEC's future plans, U.S. participation in AMEC faces an uncertain future because the United States does not have liability protection for AMEC projects in Russia other than those that were undertaken in support of CTR. From 1996 to 2002, U.S. AMEC officials worked with the other AMEC member countries to obtain liability protection through a separate agreement. According to DOD officials, this effort was suspended because the State Department is negotiating liability protection for a broad range of U.S. programs with Russia. These negotiations have not been concluded, and therefore U.S. AMEC, which does not have liability protection, has limited participation in new projects.¹³

In the interim, U.S. AMEC officials have explored other options to acquire liability protection. For example, U.S. AMEC has continued to request approval from CTR to extend liability protection for the mobile liquid waste treatment facility project. However, CTR has rejected the request because the project does not support CTR objectives. In addition, according to CTR officials, the program does not require any additional AMEC assistance and it will not extend liability protection for future AMEC projects. In the interim, U.S. AMEC officials were able to acquire limited liability protection to participate in two new projects led by the United Kingdom: (1) the safe towing of decommissioned nuclear submarines and (2) improving the buoyancy of decommissioned nuclear submarines. U.S. AMEC officials have received State Department approval to provide limited assistance to these projects using the United Kingdom's bilateral agreement with Russia as the basis for liability protection. U.S. AMEC plans to transfer funds to a United Kingdom contractor to perform a feasibility study associated with the two projects. According to U.S. AMEC officials, the United Kingdom has offered to sign all future contracts with Russia that will "hold the United States harmless of any liability." An agreement to implement this proposed solution to the liability problem had not been completed at the time of our review.

¹³The impasse over liability protection focuses on Russia's failure to ratify an extension of the agreement used to establish the CTR program. That agreement, which entered into force upon signature in 1992, contained a blanket exemption from liability for all activities funded through the CTR program. The agreement's term was 7 years, but in 1999 the United States and Russia agreed to a provisionally applied 7-year extension. However, the Russian parliament has not ratified the extension. The U.S. position is that CTR ratification is a necessary precursor to consideration of liability issues in other agreements with Russia.

DOD Has Not Adequately Justified Its Proposed Initiative to Expand Its Technology Development to Submarine Dismantlement Activities into Russia's Pacific Region

In response to Russia's request for assistance to address environmental problems resulting from military activities in the Pacific, DOD plans to expand its technology demonstration efforts to that region by developing a program similar to AMEC. However, DOD has neither adequately analyzed the condition of Russia's radioactive waste problems resulting from, among other things, decommissioned and dismantled nuclear submarines in the Pacific nor their impact on the environment. Furthermore, DOD has not identified specific projects that would be needed beyond those already being done for the Arctic region. Finally, Japan, which is assisting Russia dismantle submarines in the Pacific, has no current plans to join DOD in a technology development program.

DOD Has Proposed Expanding Its Technology Development Efforts but Has Not Adequately Analyzed the Environmental Risks or Projects That Would Be Needed

In November 1998, Russia requested DOD's assistance to establish an organization similar to AMEC in Russia's Pacific region to address environmental problems. Russia proposed 17 technical cooperation projects to develop and manufacture such things as a mobile ecological laboratory, a marine unit for ocean oil spill cleanup, and a transportable unit for radioactive waste water treatment. DOD began exploring ways to establish a cooperative program with Russia that had the potential to expand into regional cooperation with Japan and possibly other countries in the region. According to DOD officials, Congress needed to authorize expansion of the program into the Pacific region before projects could be implemented. Within DOD's fiscal year 2003 defense authorization bill, DOD sought to obtain congressional approval to amend AMEC's enabling legislation to expand the program to the Pacific region. However, no congressional action was taken on the proposal. DOD proposed new legislation within the fiscal year 2004 defense authorization bill to develop a separate cooperative program in the Pacific region, but no congressional action was taken on that initiative either.

Although DOD has asserted that the expansion of cooperative efforts is necessary because of serious environmental contamination in the Pacific region, its proposal is not based on an adequate analysis of the region's environmental conditions. Furthermore, DOD has not developed a comprehensive plan that identifies priorities, resource requirements, or timeframes for accomplishing the proposed expansion. Some U.S. environmental experts have noted that a master plan is needed in the Far East to prioritize tasks. Such a master plan is currently being developed to assist G-8 submarine dismantlement efforts in the Arctic region. This

master plan, which is funded by the European Bank for Reconstruction and Development, is expected to help donor countries improve coordination and reduce the likelihood of duplication of assistance efforts.

DOD and State Department officials told us that while the problems in the Pacific are generally known, they have not been thoroughly documented and analyzed compared to conditions in the Arctic, which has been the focus of international assistance. However, they said that available information indicates that conditions in the Pacific pose environmental risks. For example, there are environmental problems associated with Russia's decommissioned and dismantled nuclear submarines, and there are inadequate and unprotected storage facilities for spent nuclear fuel and radioactive waste. A 1994 report prepared by Greenpeace documented the radioactive waste situation in the Russian Pacific Fleet, including waste disposal problems, submarine decommissioning and safety, and the security of naval fuel.¹⁴ There have also been more recent attempts to document environmental risks posed by Russia's nuclear submarines in the Pacific region. For example, in 2003, a study by the International Institute for Applied Systems Analysis, which was funded by AMEC, found that a release of radioactivity from an accident aboard a Russian nuclear submarine in the Russian Pacific region could, under certain conditions, reach the United States in 3 to 5 days.

DOD has taken steps to develop more comprehensive data on environmental conditions in the Pacific region. It awarded a contract to a Russian organization to study the status, characteristics, radiation potential, and risks of submarine dismantlement in the Pacific. The study will include a discussion of sources of radioactive contamination and nonradioactive contamination, problems associated with monitoring and environmental remediation, and sources of hazard and risk. In addition, it will focus on (1) developing a methodology for prioritizing tasks based on safety needs, threats, and risks; (2) developing a risk-based high-priority list of urgent tasks; and (3) proposing a structure and design for a strategic plan for future actions. Once the study is completed, DOD plans to develop a plan for the proposed Pacific initiative.

¹⁴Prepared by Joshua Handler, Research Coordinator, *Greenpeace Trip Report, Subject: Radioactive Waste Situation in the Russian Pacific Fleet, Nuclear Waste Disposal Problems, Submarine Decommissioning, Submarine Safety, and Security of Naval Fuel*, (October 27, 1994).

In the interim, DOD has created a list of projects that were developed under AMEC for the Arctic region that may be applicable to the Pacific. These projects include (1) ensuring the buoyancy of decommissioned nuclear submarines, (2) providing handling for spent nuclear fuel, and (3) developing processing technologies for solid radioactive waste. According to DOD, additional projects would have to be developed in consultation with Russia and would need to take into account different climatic conditions in the Pacific. For example, the Pacific region encompasses areas with humid summers that could affect the type of equipment used. In addition, projects would also have to make allowances for the poorly developed infrastructure found in Russia's Far East. These factors could increase the complexity and costs associated with the projects.

Japan Is Dismantling Russia's Nuclear Submarines in the Pacific but Does Not Plan to Establish a Technology Development Program with DOD

According to DOD officials, DOD envisions partnering with Japan to develop a master plan that will specify projects based on assessments of the environmental conditions in the Pacific region. In addition, DOD has invited Japan to participate in the ongoing DOD-funded assessment of the environmental risks posed by decommissioned nuclear submarines in the Pacific.

Officials from Japan's Embassy to the United States and Japan's Ministry of Foreign Affairs told us that Russia's decommissioned nuclear submarines in the Pacific pose environmental and security concerns. These officials were particularly concerned that radioactive contamination from nuclear submarines could damage Japan's fishing industry. However, according to an official from Japan's Ministry of Foreign Affairs, Japan has no current plans to join DOD in a technology development program in the Pacific region. The official told us that although Japan is interested in AMEC-sponsored technologies—and how they might be applied to submarine dismantlement in the Pacific—Japan prefers to work under the auspices of the G-8 Global Partnership. Japan has committed more than \$200 million to the Global Partnership. Within the committed amount, Japan plans to allocate about \$100 million for projects related to dismantlement of Russia's nuclear submarines and other environmental projects in Russia. In December 2003, Japan began assisting the Russian dismantlement of a general purpose nuclear submarine, and the project is expected to be completed later this year. The project is expected to cost about \$7.4 million, including upgrades to the military facility where dismantlement is taking place. Japan may fund the dismantlement of 26 additional Russian nuclear submarines over the next several years.

AMEC representatives from the United Kingdom and Norway told us that their countries are not interested in funding a technology development program in the Pacific region. However, they asserted that a regional approach, similar to AMEC, might be useful to assist with submarine dismantlement efforts in that region.

Conclusions

With the completion of projects related to the CTR program, U.S. participation in AMEC is at a crossroads. AMEC is heading in a new direction that represents a significant expansion from its original environmental charter. AMEC officials have not adequately justified the expansion of the program to secure spent nuclear fuel and other material and to address security problems at Russian shipyards, naval bases, support vessels, and other facilities associated with the dismantlement process. Regardless of AMEC's plans, however, the U.S. role will be limited until the liability issue with Russia is resolved.

The proposed expansion of AMEC's goals to include improving security around naval bases where Russia is decommissioning and dismantling nuclear submarines is a low priority objective and may be inconsistent with U.S. security policy. DOE, which is responsible for securing nuclear materials in Russia, does not believe that spent nuclear fuel and other associated radioactive materials from Russia's nuclear submarines pose a high priority threat and therefore have told us they would not fund any initiatives in this area. Furthermore, improving security around Russian submarine bases may be inconsistent with U.S. policy, which generally precludes providing security upgrades around operational Russian naval facilities.

In addition, DOD's interest in expanding its technology development activities to Russia's Pacific fleet of nuclear submarines is not based on an analysis that demonstrates the need to do so, although efforts are underway to study the environmental risks. Previously developed technologies for Russia's Arctic fleet could potentially be applied to dismantling Russia's nuclear submarines in the Pacific, and there is no assessment concluding that additional projects are needed. Furthermore, Japan, which is most concerned about contamination from aging or damaged nuclear submarines in the Pacific, has begun dismantling Russian submarines in the Pacific under the auspices of the G-8 program and has not requested DOD's assistance in technology development. If further analysis in the Pacific shows that environmental conditions warrant

assistance, DOD officials stated that congressional approval for this initiative will be required.

Finally, we believe that better oversight is needed to ensure that project funds are spent on a timely basis. The approximately \$700,000 in unspent funds transferred from the Department of the Navy to EPA almost 5 years ago for the mobile liquid waste project raises concerns about the adequacy of financial and management controls being exercised over the program.

Recommendations for Executive Action

To help ensure that the United States' continued participation in AMEC supports—and is consistent with—overall U.S. assistance efforts in Russia, we recommend that the Secretary of Defense, in consultation with the Secretaries of Energy and State, take the following actions:

- determine whether AMEC's role should be expanded to include activities such as improving security around Russian nuclear submarine bases and
- ensure that AMEC's efforts are well defined, closely coordinated, and complementary with other U.S. nuclear nonproliferation programs managed by the Departments of Defense and Energy.

Regarding DOD's proposed Pacific initiative, we recommend that the Secretary of Defense:

- assess whether technology development activities should be expanded to include submarine dismantlement in that region, and if determined it is necessary, request congressional approval for this expansion to the Pacific region; and
- determine what form U.S. participation in such a technology development program would take, such as a bilateral effort or a multilateral organization similar to AMEC.

Furthermore, we recommend that the Administrator, Environmental Protection Agency determine, in consultation with the Secretary of the Navy, if the funds that were designated for AMEC-related activities are still needed for the purpose intended. If not, we recommend that the Administrator and the Secretary determine whether to reprogram the funds for other AMEC-related activities or to propose rescinding the funds.

Agency Comments and Our Evaluation

We provided the Departments of Defense and Energy and EPA with draft copies of this report for their review and comment. DOE had no comments and EPA provided technical comments, which we incorporated as appropriate. DOD provided written comments, which are presented as appendix III.

DOD concurred with all of our report's recommendations. However, in commenting on our draft report, DOD raised several concerns and observations, including: (1) AMEC's primary role is not to support the Cooperative Threat Reduction program (CTR) but to minimize the ecological security risks associated with military activities in the Arctic; (2) DOD's program plan submitted to the Congress in 1999 did not state that AMEC projects would support the goals of the CTR program; (3) our report did not adequately capture AMEC's impact on and relationship to other U.S./multinational programs such as the G-8 Global Partnership initiative; (4) AMEC's draft plan is a work in progress and is currently undergoing coordination with partner countries; and (5) our report does not capture the trend that shows increased partner country funding. Our response to DOD's comments on the report is as follows.

In our view, our draft report properly characterized AMEC's role and gave the program credit for achieving technology benefits and promoting U.S. foreign policy objectives. As we stated in the draft report, AMEC was established to help reduce the environmental impacts of Russia's military activities in the Arctic region. However, we also noted that U.S. participation in AMEC was hindered by the absence of liability protection. Given this lack of liability protection, the United States has, for the most part, tied its participation in AMEC projects to DOD's CTR liability protocol. We noted, however, in the draft report that a number of AMEC projects are not linked to the CTR program.

It is unclear to us why DOD asserted in its comments that its 1999 program plan does not state that AMEC was expected to support CTR projects. In fact, DOD's program plan clearly states on page 7 that "All AMEC activities currently underway in Russia are in support of CTR Ballistic Missile Submarine Dismantlement projects and thus are governed by CTR Implementing Agreement of August 26, 1993, between DOD and the Ministry of Economics of the Russian Federation, addressing strategic offensive arms elimination." In addition, we disagree with DOD's assertion that we did not adequately portray AMEC's relationship to other U.S./multinational programs, including the G-8 Global Partnership

initiative. Our draft report recognized that AMEC's future direction would be closely aligned with priorities established by the G-8 Global Partnership. We also noted that AMEC program partners have declared their intention to use AMEC as one way to fulfill their G-8 Global Partnership obligations. Furthermore, we recognized in the draft report that AMEC's strategic plan is a draft document and is being coordinated with partner countries.

Regarding member countries' contributions to AMEC, our report addresses this matter as well. We stated in our draft report that overall U.S. funding decreased from fiscal year 1999 to fiscal year 2004 as U.S.-funded projects have been completed and as other AMEC member countries have increased their assistance. However, in response to DOD's comment, we added this information to the highlights page of the report.

DOD concurred with our recommendation that the Secretary of Defense, in consultation with the Secretaries of Energy and State, determine whether AMEC's role should be expanded to include activities such as improving security around Russian nuclear submarine bases. However, DOD stated that AMEC's planned expansion will not include submarine base security but will focus on activities such as the G-8 Global Partnership initiative and ecological security. DOD stated that improving security around Russian nuclear submarine bases was part of a draft strategic plan that is currently being coordinated with member countries and it is inappropriate to portray any elements of the draft plan as anything other than a plan in progress.

We are encouraged that DOD now states that it will not engage in activities to improve the security at Russian nuclear submarine bases—activities that could be contrary to U.S. policy. However, we believe it is important to note that AMEC was considering improving submarine base security as part of its draft strategic plan. In our view, if AMEC provided assistance to improve the security of Russia's submarine bases, it would have represented a significant departure from the program's original environmental security objectives.

DOD also provided technical comments, which we have incorporated into the report as appropriate. Below, we summarize several of these technical comments and provide our response.

DOD incorrectly asserted in its technical comments that our draft report did not address two aspects of section 324 of the National Defense Authorization Act for Fiscal Year 2004 that required us to review AMEC: (1) the extent to which the AMEC program supports the G-8 Global

Partnership Against the Spread of Weapons and Materials of Mass Destruction Initiative and (2) the current and proposed technology development and demonstration role of AMEC in U.S. nonproliferation efforts. As we previously noted, our draft report provides information on the relationship between AMEC and the G-8 Global Partnership, noting that the future direction of AMEC will be tailored to support G-8 Global Partnership goals. The draft report also identified the various technology demonstration projects that have been proposed and implemented, including recent projects focusing on the safe towing and improved buoyancy of decommissioned nuclear submarines. These projects are expected to support G-8 nonproliferation goals as well as U.S. security interests.

DOD also asserted that we had mischaracterized AMEC's contribution to CTR as "limited" because we did not factor into our analysis the financial benefits resulting from the prototype 40-metric ton spent nuclear fuel storage container developed by AMEC. DOD claims that the cost savings from these containers has essentially paid for the AMEC program. As stated in the draft report, the AMEC containers cost less to produce than the container Russia developed to store the spent nuclear fuel and we have revised the report to more accurately indicate the amount of savings per container as noted in DOD's comments. However, we believe that DOD has not understood the larger point of our analysis. While we recognize in the report that the storage container project has proven beneficial, the other seven projects that were established to support CTR objectives have had limited impact on the CTR program. In our view, one project, regardless of its benefit, does not compensate for the shortfalls of the other projects in supporting CTR program objectives.

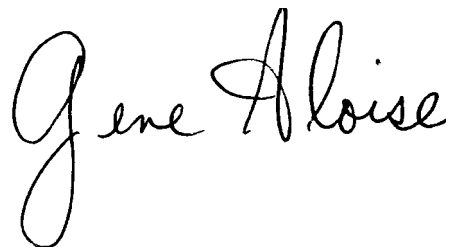
DOD stated that the report does not capture the draft nature of the AMEC strategic plan and does not properly explain the coordination process among partner countries. We disagree with this assertion. We properly identified the plan as a draft document throughout the report. Furthermore, the draft report contained information about the coordination process that DOD officials provided to us on July 14, 2004. However, we have incorporated additional information in the report about coordination timeframes to reflect DOD's comments.

In its technical comments, DOD also stated that U.S. participation in AMEC faces an uncertain future due to changing program direction, and not because it lacks liability protection. We disagree with this assertion. U.S. AMEC officials told us that U.S. participation in new AMEC projects was

hampered due to the lack of liability protection. These officials never indicated during the course of our review that changing program requirements were impacting the program. In fact, they stated in a positive vein that future U.S. participation in AMEC would be tied to the G-8 Global Partnership initiative, which was aligned with U.S. national security interests.

We are sending copies of this report to the Secretary of Defense; the Secretary of Energy; the Administrator, National Nuclear Security Administration; the Administrator, Environmental Protection Agency; the Director, Office of Management and Budget; and interested congressional committees. We will also make copies available to others upon request. In addition, this report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff have any questions concerning this report, I can be reached at 202-512-3841 or aloisee@gao.gov. Key contributors to this report were Julie Chamberlain, Nancy Crothers, Robin Eddington, Glen Levis, and Jim Shafer.

A handwritten signature in black ink that reads "Gene Aloise". The signature is written in a cursive style with a large, looped initial "G".

Gene Aloise
Acting Director, Natural Resources and Environment

List of Committees

The Honorable John W. Warner
Chairman
The Honorable Carl Levin
Ranking Minority Member
Committee on Armed Services
United States Senate

The Honorable Ted Stevens
Chairman
The Honorable Daniel K. Inouye
Ranking Minority Member
Subcommittee on Defense
Committee on Appropriations
United States Senate

The Honorable Duncan Hunter
Chairman
The Honorable Ike Skelton
Ranking Minority Member
Committee on Armed Services
House of Representatives

The Honorable Jerry Lewis
Chairman
The Honorable John P. Murtha
Ranking Minority Member
Subcommittee on Defense
Committee on Appropriations
House of Representatives

List of AMEC Projects

The following table lists AMEC projects under way, completed, newly started, or terminated.

Table 1: Status of AMEC Projects

Project	Status	Project description	Project established to support CTR?
Prototype 40-metric ton storage container	Completed	Developing a prototype storage container for the interim storage and transport of spent nuclear fuel from dismantled Russian nuclear submarines.	Yes
Storage pad	Completed	Developing concrete pad for temporary storage of spent nuclear fuel containers prior to their shipment to a permanent storage facility.	Yes
Drying technology for 40-metric ton storage containers	Terminated	Developing technology to eliminate water from storage containers to inhibit corrosion and increase container storage life.	Yes
Liquid radioactive waste treatment	Suspended	Developing mobile technology for treating liquid radioactive waste at remote sites.	Yes
Solid radioactive waste treatment	Completed	Identifying and developing technologies to process (reduce volume and stabilize) solid radioactive waste from dismantled nuclear submarines.	Yes
Solid radioactive waste storage	Completed	Identifying and developing technologies to safely store solid radioactive waste from dismantled nuclear submarines.	Yes
Radiation detection system	Completed	Developing and testing a system using Norwegian software and Russian hardware to monitor radiation levels of spent nuclear fuel on decommissioned/dismantled nuclear submarines.	Yes
Dosimeters	Completed	Providing the Russian navy with DOE-surplus dosimeters (radiation detection devices) to monitor radiation levels within proximity of nuclear submarines. Norway also provided Russia with dosimeters, but the equipment was manufactured in Russia.	Yes
Radioactive waste management facility	Completed	Supporting development of a center for radioactive waste storage at a Russian navy shipyard. The project integrates the technologies developed in the solid radioactive waste treatment and solid radioactive waste storage projects.	No
Improving buoyancy of decommissioned nuclear submarines ^a	Under way	Identifying technologies to improve the buoyancy of decommissioned nuclear submarines.	No
Improving towing technologies ^a	Under way	Developing and manufacturing equipment for the safe towing of decommissioned nuclear submarines.	No

**Appendix I
List of AMEC Projects**

(Continued From Previous Page)

Project	Status	Project description	Project established to support CTR?
Submarine dismantlement ^b	Newly started	Dismantling a general purpose Russian nuclear submarine to use AMEC-developed technologies. This project is a United Kingdom-Norway initiative and the United States is providing technical expertise.	No
Submarine dismantlement	Newly started	Reducing the hazardous wastes generated during submarine dismantlement (e.g., by using explosive cutting techniques to reduce the release of gases).	No
Contaminated soil	Partially completed	Project implemented/designated/funded by Russia and Norway to select technologies for dealing with military nonradioactive hazardous material spills in the Arctic.	No
“Clean ship” technologies	Completed	Examining technologies and designing a vessel to collect and process naval ship waste in the Barents Sea region. The vessel was never built. The intent is now to demonstrate clean ship technologies.	No
Phase 2 “clean ship” technology	Terminated	Constructing a vessel to collect and process data on naval ship waste in the Barents Sea region.	No
Environmental management of military bases	Under way	Addressing environmental protection issues at Arctic military bases.	No
Disposal of submarine batteries	Terminated	Proposing solutions for the management of used submarine storage batteries.	No
Emergency preparedness exercise	Under way	Planning and staging an exercise involving an accident with spent nuclear fuel.	No

Source: AMEC.

Notes: The United States provided or plans to provide funds for all of these projects, except the contaminated soil project, which was funded by Norway and Russia.

We did not consider the radioactive waste management facility to be a project that was established to directly support CTR program objectives. The facility was constructed to house technology demonstration projects.

^aThis project was proposed by the United Kingdom. The United States is providing funding only for preliminary project planning due to liability concerns.

^bAccording to DOD, participation is limited to providing technical expertise because the United States is not funding the dismantlement of Russia’s general purpose nuclear submarines.

Scope and Methodology

To assess the extent to which AMEC supports and complements the CTR program, we obtained and analyzed AMEC project files, reviewed pertinent supporting documentation, including project justifications, and discussed each project with program and project managers from the Departments of Defense and Energy, the Environmental Protection Agency, and Brookhaven National Laboratory. Department of State officials also provided their views about the projects. Of particular importance was an AMEC program plan that DOD submitted to the Congress in response to the National Defense Authorization Act for Fiscal Year 1999. In the plan, DOD provided information on AMEC projects' relationship to the CTR program. We used this plan as the basis for determining how AMEC projects supported the CTR program. During our review, we also interviewed DOD's Deputy Undersecretary of Defense for Installations and Environment, who is responsible for establishing U.S. policy for AMEC, to obtain his views on the impact of AMEC projects and the program's overall benefits. In April 2004, we attended a meeting of the AMEC principals in Svalbard, Norway, to obtain additional information about the AMEC program, including project implementation. During the meeting, we interviewed the principals and their staff from the United Kingdom, Norway, and Russia. These principals included the Commander of U.S. Navy Installations, the Head of Environmental Safety of the Russian Armed Forces, the Deputy Director General of Norway's Security Policy Department, and a representative from the United Kingdom's Royal Navy responsible for environmental issues. We also interviewed U.S. embassy officials in Oslo, Norway, including the U.S. Ambassador. The U.S. Ambassador to Russia provided his perspectives about AMEC in a letter to us dated May 24, 2004. We also interviewed officials from Norway's federal audit agency (Riksrevisjonen) and the Bellona Foundation, a Norwegian nongovernmental organization that focuses on environmental issues in the Arctic.

To identify AMEC financial contributions, including those from the United States, we obtained data from the AMEC program office in DOD, which is responsible for tracking all financial activities related to U.S. participation in AMEC. In addition, the AMEC program office, at our request, obtained financial data from Norway and Russia. The United Kingdom's data were provided to us by the AMEC Steering Group Co-Chairman. We obtained responses to a series of questions focused on data reliability covering issues such as data entry access, internal control procedures, and the accuracy and completeness of the data from a United Kingdom AMEC official. Although we did not interview AMEC officials from Russia and Norway, we discussed in detail the Russian and Norwegian financial data

with U.S. AMEC officials. Based on the United Kingdom responses and these discussions with U.S. AMEC officials, we concluded that the data were sufficiently reliable for the purposes of this report.

With regard to the U.S. contributions to AMEC, we reviewed the data and posed a number of questions to the AMEC program office to determine the reliability of the financial data. Specifically, we (1) met with AMEC program officials to discuss these data in detail; (2) obtained from key officials responses to a series of questions focused on data reliability covering issues such as data entry access, internal control procedures, and the accuracy and completeness of the data; and (3) added follow-up questions whenever necessary. Based on this work, we determined that the data were sufficiently reliable for the purposes of this report based on the work we performed to assure the data's reliability.

To assess AMEC's future program objectives, we examined documents prepared by AMEC and interviewed officials responsible for developing the draft strategic plan. Specifically, in May 2004, we attended a meeting of AMEC's Technical Guidance Group in Gettysburg, Pennsylvania, where the plan was formulated. While at the meeting we discussed AMEC's future plans with (1) the United Kingdom's AMEC Steering Group Co-Chairman (representing the Royal Navy), (2) representatives from Norway's Ministry of Defense and Norway's Defense Research Establishment, (3) a representative from Russia's Armed Forces Environmental Safety organization, and (4) the AMEC Steering Group Co-Chairman from DOD. In addition, we used the draft strategic plan to analyze AMEC's long-term goals and objectives, including its proposal to include nuclear security as a new program objective. We also discussed AMEC's nuclear security focus with officials from the Office of the Secretary of Defense for Cooperative Threat Reduction Policy, DOD's Office of Nonproliferation, and DOE's National Nuclear Security Administration. At DOE, we interviewed the Principal Assistant Deputy Administrator, Office of Defense Nuclear Nonproliferation; Director, Office of Global Threat Reduction; and the Acting Assistant Deputy Administrator, Office of International Material Protection and Cooperation. We also discussed these matters with a Brookhaven National Laboratory official who is leading a DOE-sponsored study on the risks associated with spent nuclear fuel from dismantled Russian nuclear submarines.

We obtained and analyzed pertinent program files maintained by DOD to evaluate DOD's plan to expand its technology development activities to the Pacific region. We also obtained available studies and reports prepared by

Greenpeace International and the International Institute for Applied Systems Analysis that identified the conditions and risks posed by radioactive contamination. We supplemented this information with interviews with knowledgeable officials from Vanderbilt University and the Department of State. The official from Vanderbilt University is responsible for managing an AMEC-funded project on radioactive contamination in the Far East. We also interviewed an official from Japan's Ministry of Foreign Affairs to obtain information about Japan's views of the environmental problems associated with radioactive waste generated by Russia's nuclear submarines.

We conducted our review from January through August 2004 in accordance with generally accepted government auditing standards.

Comments from the Department of Defense



ACQUISITION,
TECHNOLOGY
AND LOGISTICS

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

August 24, 2004

Mr. Gene Aloise
Acting Director, Natural Resources and Environment
U.S. Government Accountability Office
441 G. Street, N.W.
Washington, D.C. 20548

Dear Mr. Aloise:

The Department of Defense (DoD) appreciates this opportunity to respond to the Government Accountability Office's (GAO) draft report, "RUSSIAN NUCLEAR SUBMARINES: U.S. Participation in the Arctic Military Environmental Cooperation Program Needs Better Justification," dated August 3, 2004, (GAO Code 360424/GAO-04-924).

The Department has reviewed the draft GAO report and has the following concerns and observations:

- The Arctic Military Environmental Cooperative (AMEC) primary role is not to support the Cooperative Threat Reduction (CTR) program, but to minimize the ecological security risks associated with military activities in the Arctic.
- The Department's 1999 program plan to Congress did not state that AMEC projects would support the goals of the CTR program. The 1999 program plan states that "AMEC is currently being conducted in close cooperation with the CTR program such that these two programs have a beneficial synergistic relationship." This is in accordance with the National Defense Authorization Act for Fiscal Year 1999, Public Law 105-261. As some CTR requirements changed after project inception or delays prevented project use by CTR, some CTR-related projects were carried forward for use outside the CTR program. These projects were consistent with broader program goals and AMEC legislation.
- The report does not adequately capture AMEC's impact on and relationship with other U.S./multinational programs such as the G-8 Global Partnership Initiative, nor AMEC's ability to serve as an enabler for these programs. Within the United States, the Department of State considers AMEC part of our programs supporting the G-8 Initiative.
- Although the report text describes the full program funding situation, the report's summaries do not capture the trend toward increased partner country funding. In recent years, Norwegian contributions have greatly increased, and both Norway and the United Kingdom plan to contribute individually at levels at least equal to FY04 and future U.S. contributions.



See pp. 34-35.

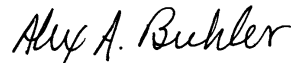
Appendix III
Comments from the Department of Defense

See pp. 34-35.

- AMEC's draft strategic plan, written in May to support the G-8 Global Partnership, is a work-in-progress and is currently undergoing coordination with partner countries. Many concepts within the plan are those of partner countries and will either be accepted once the US begins its interagency coordination of the document or will be carried out by member nations under their own funding without US participation.

Enclosed are the Department's specific responses to the recommendations and technical comments. We request that you include our attached comments in your final report.

Sincerely,



Alex A. Beehler
Assistant Deputy Under Secretary of Defense
(Environment, Safety and Occupational Health)

Enclosures
As stated

GAO DRAFT REPORT - DATED AUGUST 3, 2004
GAO CODE 360424/GAO-04-924

"RUSSIAN NUCLEAR SUBMARINES: U.S. Participation in the Arctic Military
Environmental Cooperation Program Needs Better Justification"

DEPARTMENT OF DEFENSE COMMENTS
TO THE RECOMMENDATIONS

Now on p. 33.

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense, in consultation with the Secretaries of Energy and State, determine whether AMEC's role should be expanded to include activities such as improving security around Russian nuclear submarine bases (p. 40, GAO Draft Report).

DOD RESPONSE: DoD concurs with this recommendation. We agree that the Secretary of Defense, in consultation with the Secretaries of Energy and State, determine whether AMEC's role should be expanded to include activities such as the G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction Initiative (G8 Initiative). DoD believes U.S. AMEC's future should be tied to the G-8 Initiative and ecological security activities. The Department of State considers AMEC one of several programs supporting the G-8 Initiative. DoD notes that the U.S.'s expanded role will not include activities such as improving security around Russian nuclear submarine bases. "Improving security around Russian Nuclear submarine bases" was part of a draft AMEC strategic plan that is currently being coordinated with AMEC partner countries before it goes through the U.S. interagency coordination process. It is inappropriate to portray any elements of this draft plan as anything other than a draft plan in progress.

Now on p. 33.

RECOMMENDATION 2: The GAO recommended that the Secretary of Defense, in consultation with the Secretaries of Energy and State, ensure that AMEC's efforts are well defined, closely coordinated, and complementary with other U.S. nuclear nonproliferation programs managed by the departments of Defense and Energy (p. 40, GAO Draft Report).

DOD RESPONSE: DoD concurs with this recommendation. DoD further believes the coordination should also include programs being administered by the Department of State such as the G-8 Global Partnership Initiative.

Now on p. 33.

RECOMMENDATION 3: The GAO recommended that the Secretary of Defense assess whether technology development activities should be expanded to include submarine dismantlement in that region, and if determined necessary, request congressional approval for this expansion to the Pacific region (p. 41, GAO Draft Report).

DOD RESPONSE: DoD concurs with this recommendation. The Pacific region provides unique opportunities for nuclear submarine dismantlement technology demonstrations. Some

Pacific region dismantlement sites are much further from the bases where the decommissioned submarines are located than in NW Russia, and special considerations for the safe transport of the submarines must be considered. The region also has damaged submarines with Spent Nuclear Fuel. The importance of developing technology that dismantles submarines safely in this region is demonstrated by such accidents as Chazma Bay. Although this accident occurred almost 20 years ago, highly radioactive contaminated areas remain. The safe transport of decommissioned submarines from naval bases in Kamchatka to the dismantlement site in Vladivostok is of special concern to the Japanese, because the transport route is very close to the Japanese homeland. DoD will continue coordination with interested nations such as Japan to develop specific projects. Japanese interest in these issues is shown by their official attendance at the May 2004 meeting that developed the draft strategic plan, their participation in a July 2004 project meeting concerning the safe transport of submarines to their dismantlement site and plan, to participate in the September 2004 meeting that will finalize the AMEC partners comments on the draft strategic plan and to review project proposals.

Now on p. 33.

RECOMMENDATION 4: The GAO recommended that the Secretary of Defense determine what form that U.S. participation in such a technology development program would take, such as a bilateral effort or a multilateral organization similar to AMEC (p. 41, GAO Draft Report).

DOD RESPONSE: DoD concurs with this recommendation. Any decision on the future structure of a technology development program for the Pacific will be fully coordinated and considered. The current AMEC structure provides an excellent model for cooperative activities and will assist in developing a Pacific program, but the exact form of the program must be determined.

Now on p. 33.

RECOMMENDATION 5: The GAO recommended that the Secretary of the Navy consult with the Administrator, Environmental Protection Agency (EPA), to determine whether funds that were designated for AMEC-related activities are still needed for the purpose intended. If not, GAO recommended that the Secretary and Administrator determine whether to reprogram the funds for other AMEC-related activities or to propose rescinding the funds (p. 41, GAO Draft Report).

DOD RESPONSE: DoD concurs with this recommendation. This project was on hold for an extended period awaiting nuclear liability coverage, first from the proposed AMEC Trilateral Agreement and then from the Multilateral Nuclear Environmental Programme in Russia (MNEPR). Although the MNEPR agreement is in effect, the U.S. has not accepted the liability terms. The AMEC partners have expressed renewed interest in this project and have proposed using their bilateral agreement with Russia to provide the appropriate liability protection. DoD is coordinating this effort with EPA.

GAO DRAFT REPORT - DATED AUGUST 3, 2004
GAO CODE 360424/GAO-04-924

"RUSSIAN NUCLEAR SUBMARINES: U.S. Participation in the Arctic Military
Environmental Cooperation Program Needs Better Justification"

TECHNICAL COMMENTS

1. **Page 8, paragraph 2** – The reports does not adequately capture AMEC’s impact on and relationship to other U.S./multinational programs such as the G-8 Global Partnership Initiative, nor AMEC’s ability to serve as an enabler to these programs. Within the U.S., the Department of State considers AMEC part of our programs supporting the G-8 Initiative.

Section 324 of the National Defense Authorization Act for Fiscal Year 2004 requires the Comptroller General to:

- (a) Conduct a review of the Arctic Military Environmental Cooperation program, including—
- (1) the current and proposed technology development and demonstration role of the program in United States nonproliferation efforts; and
 - (2) the relationship of the program to the Cooperative Threat Reduction Program specified in section 1501(b) of the National Defense Authorization Act for Fiscal Year 1997 (Public Law 104-201; 110 Stat. 2731; 50 U.S.C. 2362 note).
- (b) Elements of Review—The review shall include an assessment of the following:
- (1) Whether the conditions in the Western Pacific region require an expansion of the Arctic Military Environmental Cooperation program to include that region.
 - (2) The extent to which foreign countries, including Russia, make financial contributions to the program.
 - (3) The extent to which the Cooperative Threat Reduction Program and the G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction Initiative use the program.
 - (4) Whether the program is important to the disarmament and nonproliferation functions of the Cooperative Threat Reduction Program.
 - (5) Future-year funding and program plans of the Department of Defense for the program.

The GAO report addresses only the following: (1) assessment of the extent to which AMEC supports and complements the CTR program, (2) identification of participating countries’ financial contributions to AMEC, (3) assessment of AMEC’s future program objectives, and (4) evaluation of DoD’s proposal to expand its technology development activities to Russia’s Pacific region.

2. **Page 9, Paragraph 1** – The Department’s 1999 program plan to Congress did not state that AMEC projects would support the goals of the CTR program. The 1999 program plan states that

Now on pp. 5-6.

See pp. 34-35.

Now on p. 6.

See p. 34.

Appendix III
Comments from the Department of Defense

“AMEC is currently being conducted in close cooperation with the CTR program such that these two programs have a beneficial synergistic relationship.” This is in accordance with the National Defense Authorization Act for Fiscal Year 1999, Public Law 105-261.

Now on p. 7.
See pp. 7 and 14.

3. **Page 10, second subparagraph last sentence** – In the August 2, 2004, letter that was provided to GAO, the Russian AMEC Principal, General Yunak, expresses his satisfaction with the progress of AMEC projects and states that the U.S. dosimeters provided under Project 1.5 are currently being used by the shipyard during the nuclear submarine dismantlement process.

Now on p. 7.
See p. 36.

4. **Page 10, last paragraph first sentence** – **This paragraph characterizes AMEC as providing “limited contribution to CTR.”** The AMEC program essentially paid for itself since the AMEC cask costs 80% less than the current single-purpose Russian SNF transport container. It takes 10 – 12 casks per submarine, and CTR plans to dismantle over 40 submarines. This “limited contribution to CTR” characterization should also be corrected in the summary page in the section “What GAO Found.” First paragraph sixth line from the bottom, by deleting “Despite AMEC’s, limited contribution to CTR.”

Now on p. 8.

5. **Page 11, paragraph 1 second to last sentence** – U.S. funding levels did decline as U.S. funded projects have been completed, but also because foreign contributions have been increasing.

Now on p. 8.
See p. 26.

6. **Page 11, paragraph 2** – The draft strategic plan is a work in progress. It has not been approved by the AMEC Principals nor vetted through the interagency process. These documents were given to GAO to show that the AMEC program was progressing toward development of a path forward. The next step is to meet with AMEC partners in September 2004 to finalize their comments on the draft plan and to review project proposals. The U.S. will submit the final draft for U.S. interagency coordination later in 2004.

Now on pp. 8 and 28.
See pp. 36-37.

7. **Page 11, paragraph 2, third sentence from the bottom** – U.S. participation in AMEC faces an uncertain future not because it lacks liability protection, but because of changing program direction. Page 34 of the GAO report mentions that other options are being explored to acquire liability protection.

Now on p. 9.

8. **Page 12, paragraph 1** – It is not that the Japanese lack interest, they just have not found a way to join AMEC since their dismantlement program comes under the Ministry of Foreign Affairs and has no military link. The Japanese participated in the May 2004 meeting that developed the draft strategic plan, they participated in a July 2004 project meeting concerning the safe transport of submarines to their dismantlement site, and they plan to participate in the September 2004 meeting with the AMEC partners.

Now on p. 11.
See p. 11.

9. **Page 15, second sentence** - The EPA official provided the following information regarding the cost of the container to DoD: “When serially-produced, this container costs less than 20% of the cost of the current single-purpose Russian SNF transport container.” This means that the container costs 80% less than the Russian container, not 20% less.

Appendix III
Comments from the Department of Defense

Now on p. 13.
See p. 13.

10. **Page 17, subparagraph 1** – The CTR-supplied equipment and infrastructure at the Russian shipyard Nerpa will also be available for the dismantlement of Russia’s general purpose submarines.

Now on p. 13.

11. **Page 17, subparagraph 2** – CTR has now limited this project to simply providing the design of the dehydration system to Russia.

Now on p. 15.

12. **Page 19 and 20, last two paragraphs** – the GAO quotes AMEC officials as asserting that planning was done for CTR projects with "full cooperation and approval of the CTR program and the appropriate Russian government agencies." This language, however, is not included in the summaries, which seem to blame the AMEC program for lack of support. The summaries also do not include the final paragraph of the report, which states that AMEC plays a useful role. This supports the idea that AMEC has other uses. To reinforce this point within the limited space in the one-page summary, the DoD suggests that in the first paragraph under "What GAO found," the words "including the CTR program" be added after "DoD officials" six lines from the bottom of the paragraph.

Now on p. 18.
See p. 18.

13. **Page 23, paragraph 1** – The U.S. Ambassador to Russia stated in a letter that he recommended "consideration of expansion of the AMEC program to the Russian Pacific Fleet where the opportunity exists to conduct a similar multi-national program with Russia, US, Japan and Republic of Korea."

Now on pp. 19-20 and
p. 22.

14. Page 25, bottom and 26 – this makes the points about future funding for the program, all of which is not included in the summaries. The first sentence, on page 28, is an excellent quote that easily could be placed in the summary.

Now on p. 26.
See pp. 8 and 26.

15. **Page 32, paragraph 1** -- The report does not capture the nature of the AMEC strategic plan as a draft work in progress and does not properly explain the coordination process. The plan is currently under review by Russia and Norway. The United Kingdom has already commented. After coordination among the national participants is completed, the plan will be coordinated within DoD as well as through an interagency process to ensure that it reflects the U.S. position. This plan will then go to the representatives of AMEC partners for final approval.

Now on p. 28.
See p. 28.

16. **Page 34, middle paragraph, fourth line** - Change "Since 1996" to "From 1996 to 2002." The last line also should have "not" after "does."

Now on p. 28.
See p. 28.

17. **Page 35, top of page, first line** - The goal of this project is not to remove radioactive waste from decommissioned nuclear submarines but to improve the buoyancy of these submarines to keep them from sinking while awaiting dismantlement.

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