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Report to Congressional Requesters

April 2000

BIOLOGICAL WEAPONS

Effort to Reduce Former Soviet Threat Offers Benefits, Poses New Risks

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Accountability * Integrity * Reliability

GAO/NSIAD-00-138

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National Security and
International Affairs Division

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April 28, 2000

The Honorable Floyd Spence
Chairman
The Honorable Ike Skelton
Ranking Minority Member
Committee on Armed Services
House of Representatives

The Honorable Pat Roberts
Chairman, Subcommittee on Emerging
Threats and Capabilities
Committee on Armed Services
United States Senate

Although it signed the 1972 Biological and Toxin Weapons Convention,[1] the former Soviet Union covertly developed the world's largest offensive biological weapons program, which relied on a network of military and nonmilitary scientific institutes, according to a January 2000 Department of Defense report to Congress.[2] Many of these nonmilitary institutes were overseen by Biopreparat—an ostensibly civilian pharmaceutical enterprise that exploited the inherent dual-use nature of biotechnology to mask Soviet development of biological weapons using specially engineered strains of dangerous pathogens, including anthrax, plague, and smallpox. Russia renounced the Soviet program in 1992 and subsequently cut funding for Biopreparat institutes; nonetheless, the United States remains concerned about the extent of Russia's compliance with the Convention. Reasons for concern include Biopreparat's retention of its Cold War leadership and existing ties to former Soviet nonmilitary biological weapons institutes in Russia, although Biopreparat no longer funds them. Although Russia has generally allowed the United States access to its nonmilitary institutes that receive U.S. nonproliferation assistance, Russia has consistently rebuffed

[1]The Convention's full title is the *"Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction"* (26 U.S. Treaty 583, Apr. 10, 1972).

[2]*Section 1308: Report on Biological Weapons Programs in Russia* (Arlington, VA: Department of Defense, Jan. 2000). This report is required under the National Defense Authorization Act for Fiscal Year 1999 (P.L. 105-261).

U.S. efforts to inspect its military institutes currently managed by the Ministry of Defense.

Notwithstanding these concerns, in 1994 the United States began funding collaborative research projects with former Soviet biological weapons scientists[3] because it feared that these scientists might be driven by financial pressures to sell their skills to countries of proliferation concern or to terrorist groups.[4] The executive branch initially funded this effort at modest levels and used it to redirect scientists to peaceful activities; however, it is now expanding the program's size and scope. Because of this shift, you asked us to review U.S. efforts to address the threat of biological weapons proliferation from the former Soviet Union. Accordingly, we examined

- the potential threats that the former Soviet biological weapons institutes could pose to the United States,
- current and future U.S. efforts to address these threats, and
- risks associated with the expanded U.S. effort and executive branch plans to mitigate them.

Key sources of information for this report include policy and program officials from the Departments of State, Defense, and Energy, as well as other U.S. government agencies and nongovernmental organizations. We also obtained information about the former Soviet biological weapons program from the former Deputy Chief of Biopreparat (1988-92), who now lives in Virginia. In December 1999, we visited six former Soviet nonmilitary biological weapons institutes in Russia that receive U.S. assistance. We also visited and met with officials from the International Science and Technology Center in Moscow. We developed this report based on unclassified sources and information; however, we also obtained classified information from the Departments of State and Defense.

[3]Early engagement efforts were funded through the International Science and Technology Center using Department of Defense Cooperative Threat Reduction funds. Funding responsibility for the Science Center was transferred to the Department of State in 1996.

[4]We defined terrorists as non-state actors that are not provided with a state-developed weapon. Terrorists could be of foreign or domestic origin and would be operating illegally and outside a state-run laboratory infrastructure or weapons program.

Results in Brief

The former Soviet Union's biological weapons institutes continue to threaten U.S. national security because they have key assets that are both dangerous and vulnerable to misuse, according to State and Defense Department officials. These assets include as many as 15,000 underpaid scientists and researchers, specialized facilities and equipment (albeit often in a deteriorated condition), and large collections of dangerous biological pathogens. These assets could harm the United States if hostile countries or groups were to hire the institutes or biological weapons scientists to conduct weapons-related work. Also of concern is the potential sale of dangerous pathogens to terrorist groups or countries of proliferation concern. State and Defense officials told us that since 1997, Iran and other countries have intensified their efforts to acquire biological weapons expertise and materials from former Soviet biological weapons institutes. In addition, deteriorated physical safety and security conditions could leave dangerous pathogens vulnerable to theft or distribution into the local environment. Finally, much of the former Soviet biological weapons program's infrastructure, such as buildings and equipment, still exists primarily in Russia. While most of these components have legitimate biotechnological applications, they also harbor the potential for renewed production of offensive biological agents.

The U.S. strategy for addressing these proliferation threats at the source has been to fund collaborative research activities with the institutes to (1) reduce their incentives to work with hostile states and groups and (2) increase their openness to the West. While the executive branch initially implemented this strategy with a modest level of funding, it is now seeking a tenfold increase in funding in response to intensified proliferation attempts by Iran and other countries of proliferation concern. The increased funding will support an expanded array of collaborative activities, including biodefense research[5] against biological agents, security upgrades to select facilities, and dismantlement of unneeded facilities.

- For fiscal years 1994 through 1999, the United States allocated about $20 million, primarily from the Departments of State, Defense, and Energy, to fund collaborative research projects to help redirect former biological weapons scientists to peaceful research activities. Key

[5]Biodefense research focuses on civilian and military protection against the use of biological agents, including developing medical countermeasures, vaccines, and diagnostic systems.

program benefits during this period included providing grants to fund more than 2,200 former Soviet biological weapons personnel—including more than 745 senior biological weapons scientists—and gaining some access to more than 30 of about 50 nonmilitary institutes. State and Defense officials told us that the U.S. programs have denied proliferators such as Iran access to biological weapons expertise and scientists at over 15 former Soviet biological weapons institutes.

- For fiscal years 2000 through 2004, the executive branch plans to spend about $220 million to expand its efforts to engage former Soviet biological weapons institutes. About half of these funds will be used to continue efforts to redirect scientists toward peaceful civilian research.
- In an emerging area of emphasis, Defense and State plan to spend about $36 million to fund collaborative research with Russian institutes on dangerous pathogens. This research is intended to improve the U.S. defenses against biological weapons threats. The Department of Defense also plans to spend (1) $40 million to upgrade security and safety systems at select facilities in Russia and (2) $39 million to consolidate and dismantle biological weapons facilities in Russia as it has done in Kazakhstan—if Russia agrees.

We found that expanding the program will pose certain risks to the United States. The key risks include sustaining Russia's existing biological weapons infrastructure, maintaining or advancing Russian scientists' skills to develop offensive biological weapons, and the potential misuse of U.S. assistance to fund offensive research. Although seeking to add international transparency and compliance provisions to the Biological and Toxin Weapons Convention, the United States relies on safeguards implemented at the institute and project levels to mitigate risk. Such safeguards include (1) securing assurances from the institutes that they will abstain from offensive research or proliferation activities, (2) performing interagency reviews of all proposed projects, and (3) implementing a set of financial and programmatic oversight mechanisms for all projects. To mitigate risks associated with research on dangerous pathogens, the United States plans to use U.S. experts residing in Russia and—if Russia permits—at the institutes to monitor the projects. None of these measures, however, would prevent Russian project participants or institutes from potentially using their skills or research outputs to later work on offensive weapons activities at any of the Russian military institutes that remain closed to the United States.

Background

Biological weapons are viral or bacterial pathogens, or toxins that have been developed to cause disease in humans, animals, or plants or lead to the destruction of materials. They are considered to be weapons of mass destruction, as are nuclear, chemical, and radiological weapons.

The United States halted its biological weapons program in 1969. In 1972, the United States, the Soviet Union, and a number of other states signed the Biological and Toxin Weapons Convention, which prohibits the stockpiling and production of microbial and other agents for offensive purposes. Unlike other arms control treaties, the Biological and Toxin Weapons Convention contains no verification provisions to assess compliance. The Convention also permits research on biological agents for peaceful purposes, which may include the development of new vaccines and other medical countermeasures to infectious agents. This type of research is difficult to distinguish from offensive research because of the inherent dual-use nature of biotechnology. For example, equipment that can be used to produce vaccines can also be used to produce biological weapons. Research that supports medical responses to infection can also be applied toward offensive weapons development.

Following its ratification of the Biological and Toxin Weapons Convention in 1972, the Soviet Union established Biopreparat as a civilian pharmaceutical and biotechnology enterprise, which also served as the civilian focal point of the Soviet biological weapons program. According to the former Deputy Chief of Biopreparat, by the late 1980s, the Soviet biological weapons complex included about 50 institutes and employed 60,000 personnel. Capitalizing on post-1972 advances in biotechnology such as genetic engineering, the Soviet Union program researched and produced a range of weapons employing smallpox, anthrax, plague, and other dangerous pathogens. In 1992, Russian President Boris Yeltsin acknowledged the existence of the Soviet Union's offensive biological weapons program and pledged that Russia would comply with the terms of the Convention.

The current U.S. strategy to combat the proliferation of biological or other weapons of mass destruction focuses on preventing the supply or acquisition of such weapons, adapting U.S. military forces and emergency assets to respond to their use, reducing existing foreign capabilities, and deterring the use of such weapons. Increasing concerns regarding the potential use of biological weapons by countries of proliferation concern or terrorist groups led the United States to allocate about $1.4 billion in fiscal

year 1999 for governmentwide biological defense programs, including civilian and military force protection, bioterrorism countermeasures, and emergency preparedness.

The United States is currently funding two key programs designed to prevent the proliferation of former Soviet scientists who have expertise in developing weapons of mass destruction, including nuclear, chemical, and biological weapons.

- Since 1994, the United States has provided assistance to former Soviet weapons of mass destruction scientists and engineers through the International Science and Technology Center in Moscow. The Science Center was established by the United States, the European Union, Russia, and Japan in November 1992 to provide peaceful research opportunities to former Soviet weapons scientists and redirect their skills away from producing weapons of mass destruction. The Science Center provides most of its assistance in the form of tax-free grants that are deposited directly into the individual accounts of participating scientists and engineers. The Science Center maintains a staff of over 100 to provide management and financial oversight. U.S.-funded projects are also subject to audits by the U.S. Defense Contract Audit Agency.[6]

  The Department of State serves as the U.S. coordinator to the Science Center. State has used FREEDOM Support Act[7] and the Department of Defense Cooperative Threat Reduction programs to fund core collaborative research projects. Since 1997, the National Academy of Sciences, the Defense Advanced Research Projects Agency, the Defense Threat Reduction Agency, and the Departments of Agriculture and Health and Human Services signed partnership agreements with the Science Center that allow them to fund their own biotechnology projects through the Center.

[6]Through 1999, the Defense Contract Audit Agency had issued audit reports for 10 biotechnology projects.

[7]The Freedom for Russia and Emerging Eurasian Democracies and Open Markets Support Act of 1992, or the FREEDOM Support Act (P.L. 102-511), provides for economic and nonproliferation assistance to the independent states of the former Soviet Union.

- The Department of Energy launched the Initiatives for Proliferation Prevention program in 1994 to engage former Soviet nuclear, chemical, and biological weapons scientists in research that is oriented toward commercial activities. The program relies on U.S. national laboratories to take the lead in working with former Soviet weapons institutes. The program funds its research projects through firm fixed-price contracts with the institutes and pays the institutes for specified deliverables. Our 1999 review of the program raised numerous concerns, including the extent to which program funds went to U.S. national laboratories versus former Soviet institutes, and the extent to which some of its projects involved dual-use research.[8]

Former Soviet Biological Weapons Assets Continue to Pose Threats

Former Soviet biological weapons institutes continue to pose serious threats to U.S. national security, particularly in light of Russia's continued economic distress. Primarily located in Russia, these institutes possess significant assets in terms of human capital, physical infrastructure, and dangerous pathogen collections. These assets could pose a potential threat through (1) proliferation of biological weapons expertise to countries or terrorist groups seeking such weapons; (2) proliferators seeking to engage these institutes in weapons research; (3) theft, sale, transfer or industrial accidents involving dangerous pathogens; and (4) Russia's use of these assets to reconstitute an offensive biological weapons program.

Former Soviet Biological Weapons Institutes Still Possess Dangerous Assets

About 50 former Soviet biological weapons institutes continue to exist today—most of which are in Russia. Defense Department officials told us that the Russian Ministry of Defense still manages at least four former Soviet military biological weapons institutes to which Russia has consistently refused to grant the United States access. A senior Science Center official noted that the Russian government has not restricted the Center's access to former Soviet nonmilitary biological weapons institutes that receive U.S. assistance. While the Science Center has funded projects and gained access to more than 30 such institutes, the official noted that at least 15 other nonmilitary institutes have not received Center funding.

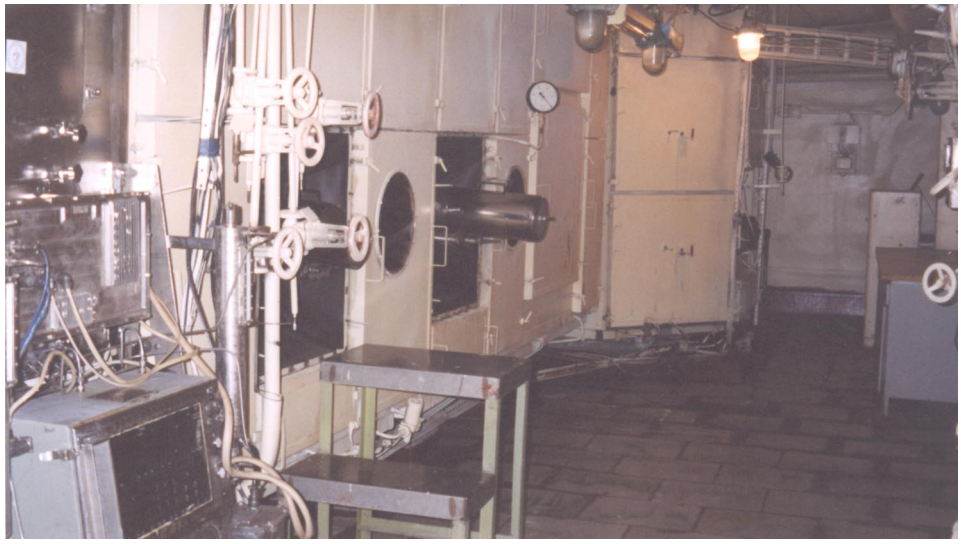
[8] *Nuclear Nonproliferation: Concerns With DOE's Efforts to Reduce the Risks Posed by Russia's Unemployed Weapons Scientists* (GAO/RCED-99-54, Feb. 19, 1999).

The Science Center official also estimated that there may be as many as 5,000 senior former Soviet biological weapons scientists who could pose significant proliferation risks and another 10,000 personnel who have weapons-relevant skills. At the six institutes that we visited in December 1999, institute officials said their institutes had lost as much as one-half of their former workforce but noted that they had released administrative and technical support staff in efforts to retain their senior scientists. The senior Science Center official also said these highly trained senior scientists, many with doctorates or other advanced degrees, represent the intellectual core of the world's largest and most sophisticated biological weapons program.

During our visit to the six institutes, we observed that many of these institutes have retained physical assets that could be applied to biological weapons research. Officials at two of the Russian institutes—the State Research Center for Virology and Biotechnology (Vector) and the State Research Center for Applied Microbiology (Obolensk)—said they continue to conduct research on live pathogens for legitimate purposes. Research on dangerous live pathogens, whether for legitimate or illicit purposes, requires advanced biosafety containment laboratories, which these institutes maintained.

- At the Russian State Research Center for Virology and Biotechnology (Vector), we observed one of the institute's two large aerosol test chambers, which institute officials said are the largest in Russia or Europe (see fig. 1). Aerosol test chambers are used to test and refine the aerosolization of biological agents—a critical aspect of biological weapons delivery. Defense Department officials told us that neither chamber had been used in years.

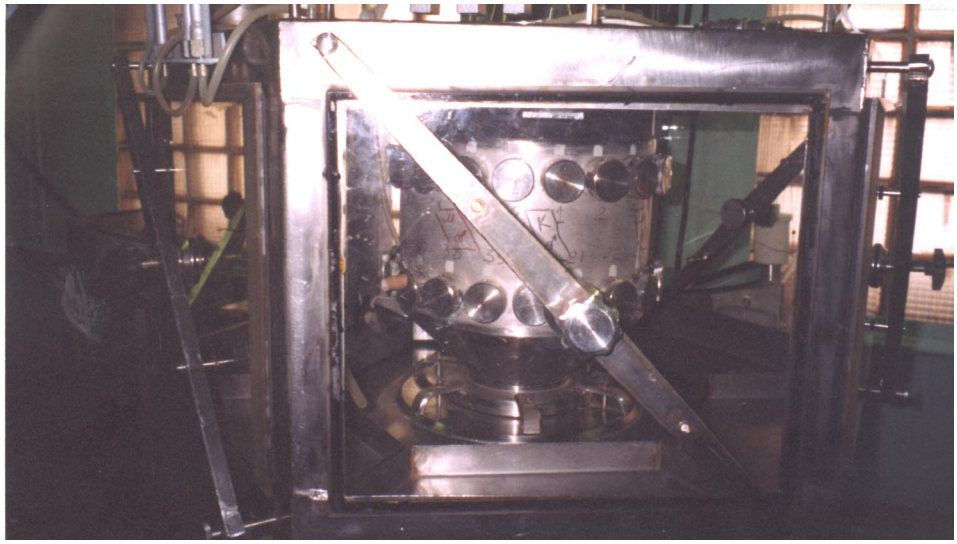
Figure 1: Large Aerosol Test Chamber at Russia's State Research Center for Virology and Biotechnology (Vector), Koltsovo, Russia



Source: GAO.

- At Russia's State Research Center for Toxicology and Hygienic Regulation of Biopreparations, we observed 10 advanced aerosol test chambers in which researchers currently conduct toxicology studies for chemical and biotechnology research (see fig. 2).

Figure 2: Small Aerosol Test Chamber at the State Research Center for Toxicology and Hygienic Regulation of Biopreparations, Serpukhov, Russia



Source: GAO.

- At the Puschino branch of the Shemyakin-Ovchinnikov Institute, we toured a large animal breeding and testing facility. U.S. and institute officials told us the facility—constructed by the Soviet Ministry of Defense for $18 million in 1989—is the most modern facility among the former Soviet biological weapons institutes. A U.S. scientist accompanying us during our tour stated these state-of-the-art animal facilities would be an asset to Russia's biotechnology field. Institute officials noted that in 1999, the United States provided about $500,000 to upgrade a small rodent breeding facility. This upgrade will allow the facility to conduct internationally certified clinical testing and to breed animals for use in other biotechnical research and development projects throughout Russia.[9]

Several former Soviet biological weapons institutes continue to maintain vast collections of dangerous pathogens that could be used for legitimate public health research or for an offensive biological weapons program.

[9]All U.S. government funded projects must meet U.S. scientific and safety regulatory requirements.

- Vector is one of the world's two authorized smallpox repositories (see fig. 3).[10] In addition to smallpox, the Department of Defense has reported that Vector continues to maintain a culture collection that includes over 15,000 viral strains, including the highly lethal Marburg and Ebola viruses.

Figure 3: Smallpox Repository (building on right) at the Vector Research Institute, Koltsovo, Russia

Source: GAO.

- According to the Organization for Economic Cooperation and Development, the State Research Center for Applied Microbiology (Obolensk) contains a 2,000 microorganism collection that includes genetically engineered strains of anthrax and other dangerous pathogens.
- A December 1999 Russian journal article identified the Russian Ministry of Defense's Microbiology Scientific Research Institute at Sergiyev Posad as maintaining a national collection of dangerous pathogens, including Ebola, Marburg, and Lassa viruses.[11]

[10]The World Health Organization has authorized Vector and the U.S. Centers for Disease Control and Prevention in Atlanta, Georgia, as the two official smallpox repositories.

[11]Fedor Smirnov, *"Taming Viruses: Center for Special Diagnosis and Treatment of Ultradangerous and Exotic Infectious Diseases Created"* (Moscow, Russia: Moscow Meditsinskaya Gazeta, Dec. 29, 1999).

- According to a recent Henry L. Stimson Center report,[12] several agricultural and anti-plague institutes in Russia and Kazakhstan maintain dangerous pathogen collections for their research.

Assets Are Vulnerable to Misuse

These threat assets could be misused if third parties obtained access either to the scientists, the institutes, or the pathogens themselves. The assets could also be subject to unauthorized access or used to sustain or renew an offensive biological weapons program.

Proliferation of Weapons Expertise

State, Defense, and Energy Department officials said the dire financial conditions at former Soviet biological weapons institutes could encourage the proliferation of weapons expertise to countries or groups of concern. This proliferation could occur either if former Soviet biological weapons scientists emigrate to countries of proliferation concern in search of higher pay or if such countries or terrorist groups engage impoverished institutes in research that would augment their biological weapons programs. State and Defense officials told us that since 1997 Iran and other countries of proliferation concern have intensified their efforts to acquire biological weapons expertise and materials from at least 15 former Soviet biological weapons institutes. An unclassified Central Intelligence Agency report notes that these countries and terrorist groups could make dramatic leaps forward in their biological weapons programs by importing talent from Russia.[13] Another unclassified Central Intelligence Agency report notes that Russia is a significant source of biotechnology expertise for Iran and that Russia's world-leading biological weapons program makes it an attractive target for Iranians seeking technical information and training on biological weapons production processes.[14]

[12]Amy Smithson, *Toxic Archipelago: Preventing Proliferation from the Former Soviet Chemical and Biological Weapons Complexes* (Washington, D.C.: Henry L. Stimson Center, Dec. 1999).

[13]*Statement of Special Assistant to the Director of Central Intelligence for Nonproliferation John A. Lauder on the Worldwide Biological Warfare Threat to the House Permanent Select Committee on Intelligence as Prepared for Delivery on March 3, 1999* (Langley, VA: Central Intelligence Agency, Mar. 3, 1999).

[14]*Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, January 1 to June 30, 1999* (Langley, VA: Central Intelligence Agency, Feb. 2, 2000).

Five of the six institute directors told us of significant reductions of funding since the breakup of the former Soviet Union. Officials at Russia's State Research Center for Applied Microbiology told us that their operating budget dropped from about $25 million in 1991 to about $2.5 million in 1999. Institute officials said the actual purchasing power of the scientists' salaries had decreased by more than 75 percent during this time. Numerous senior scientists told us their current salaries ranged from $40 to $80 a month.

Institute officials at the six institutes we visited said most of the scientific staff that had left their institutes had gone to the United States or Europe. Although none of the institute officials reported knowledge of scientists moving to countries of proliferation concern, the former Deputy Chief of Biopreparat and various media reports identify instances in which scientists have moved to such countries. Officials at three institutes we visited reported that, in the past, representatives of countries of proliferation concern had approached them seeking to initiate questionable dual-use research. Officials at the three institutes told us they had refused these offers because of a pledge made to U.S. executive branch officials as a condition of receiving U.S. assistance. The pledge includes avoiding cooperation both with countries of proliferation concern or with terrorist groups.

Theft, Sale, Transfer or Accidental Release of Dangerous Pathogens

Officials from the Departments of State and Defense said they are concerned that dangerous pathogen stocks could be stolen and used for illicit purposes or that an industrial accident could occur. These officials cited a recent nongovernmental report that identified several instances of theft or diversion of dangerous pathogens, including smallpox, plague, and anthrax, from institutes in Russia, Georgia, and Kazakhstan.[15] The Defense Department notes that providing physical security is difficult because of the small size of pathogen vials. Also, pathogens cannot be detected using X-ray machines. For example, a seed culture of dried anthrax spores could be carried in a sealed plastic vial the size of a thumbnail, making detection almost impossible. Also of concern is the potential sale of dangerous pathogens to terrorist groups or countries of proliferation concern. Although some institutes had impressive equipment and modern facilities, we also observed that much of the infrastructure was severely deteriorated

[15]Jonathan B. Tucker and Kathleen M. Vogel, "Preventing the Proliferation of Chemical and Biological Weapons Materials and Know-How", *The Nonproliferation Review*, Vol. 7 No. 1 (Spring 2000).

or often unused. Deteriorated conditions may be compounded by potential human error such as the case of the 1979 accidental release of anthrax from a Soviet military facility in Sverdlovsk, Russia (now Yekaterinburg), which resulted in the deaths of at least 66 people.

Potential for Sustaining or Renewing an Offensive Program

Russia could potentially sustain or renew an offensive biological weapons program by using the former Soviet program's existing human and physical assets, according to State and Defense Department officials. Such assets include the institutes, which supported a covert national offensive biological weapons program that continued in spite of the Biological and Toxin Weapons Convention. The Department of Defense has reported[16] that the United States remains concerned about Russia's biological weapons capabilities and its compliance with the Convention. State and Defense officials told us in March 2000 that they remain concerned that offensive research may continue to take place at the Russian Ministry of Defense facilities to which the United States has no access. Another issue of concern is that the leadership of the former Soviet biological weapons program remains largely in place. In a January 2000 report,[17] the Defense Department stated that the same generals who directed the Soviet biological weapons program continue to lead the greatly reduced Russian military defensive biological weapons program, while the same Soviet-era general continues to direct Biopreparat.

U.S. Effort to Address Former Soviet Biological Weapons Threat Is Expanding in Size and Scope

To address the continued threat posed by former Soviet biological weapons assets, the executive branch is expanding its cooperative engagement efforts with the former Soviet biological weapons institutes. Initial efforts were designed to address the U.S. strategic objectives of reducing proliferation by discouraging institutes and their scientists from cooperating with countries of proliferation concern or terrorist groups while increasing their openness to the United States and the international community. Through 1999, the United States had provided more than $20 million to fund civilian collaborative research project grants to more than 2,200 personnel from former Soviet biological weapons institutes. As a result of these activities, the United States obtained some degree of access to more than 30 former Soviet biological weapons institutes. State and Defense officials told us that the U.S. programs have denied proliferation

[16] *Section 1308: Report on Biological Weapons Programs in Russia.*

[17] *Section 1308: Report on Biological Weapons Programs in Russia.*

attempts by Iran and other countries of proliferation concern to more than 15 former Soviet biological weapons institutes. In addition, the United States has provided $4 million to dismantle the world's largest anthrax production and weaponization facility in Stepnorgorsk, Kazakhstan. In response to the intensified proliferation attempts by Iran and other countries of proliferation concern, the executive branch now plans to greatly expand its program to increase the civilian research component and broaden the scope to include biodefense research, security enhancements at select facilities, and—if Russia agrees—the consolidation and dismantlement of select former Soviet biological weapons facilities in Russia.

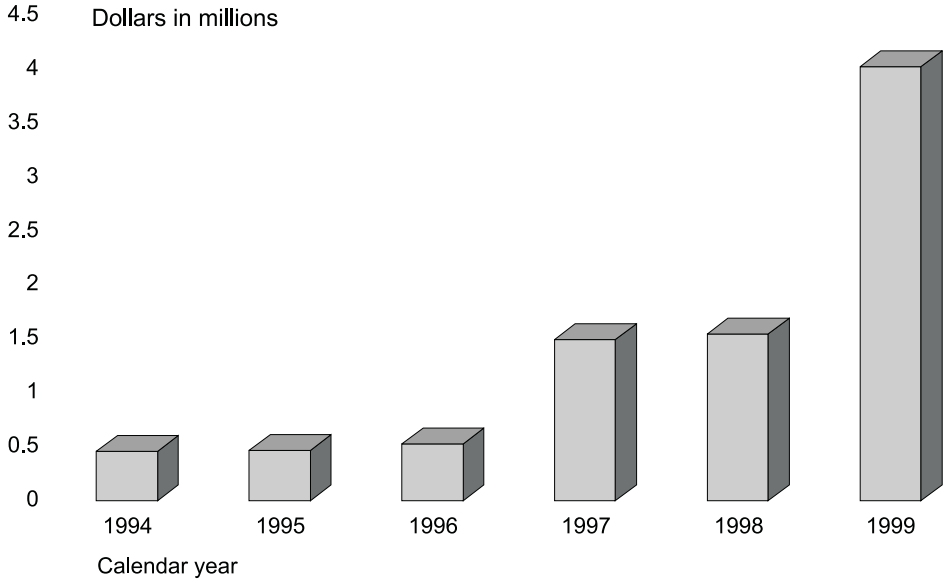
Initial U.S. Program Centered on Redirecting Biological Weapons Scientists

U.S. program efforts to date have relied primarily on two mechanisms to fund nonproliferation activities at former Soviet biological weapons institutes—the International Science and Technology Center and the Department of Energy's Initiatives for Proliferation Prevention program.[18] From 1994 through 1999, the United States channeled about $8.5 million through the International Science and Technology Center to fund 61 biotechnology projects in Russia, Kazakhstan, and Armenia.[19] As shown in figures 4 and 5, this assistance and the number of projects funded have risen sharply since 1996.

[18]The U.S. Civilian Research and Development Foundation for the Independent States of the former Soviet Union provided $829,813 to fund 16 biomedical and behavioral sciences cooperative scientific research activities in Russia (8), Kazakhstan (4), Ukraine (3), and Georgia (1) through 1999.

[19]From January 1, 2000, through February 1, 2000, the Science Center funded an additional eight biotechnology projects totaling about $2.5 million.

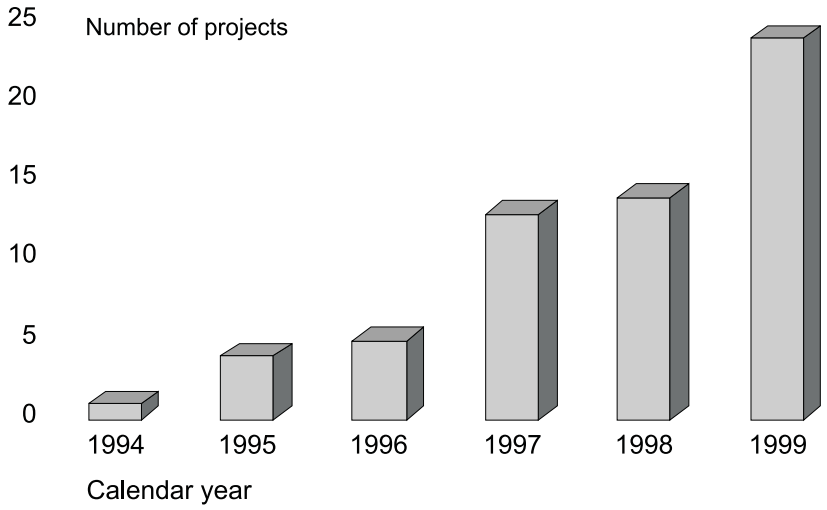
Figure 4: U.S. Funds Provided for Science Center Biotechnology Projects (U.S. portion only), 1994-99



Note: Some projects are jointly funded with other Science Center financing members, including the European Union, Japan, Norway, and the Republic of Korea.

Source: GAO analysis of International Science and Technology Center data.

Figure 5: Number of Science Center Biotechnology Projects Funded (U.S. portion only), 1994-99



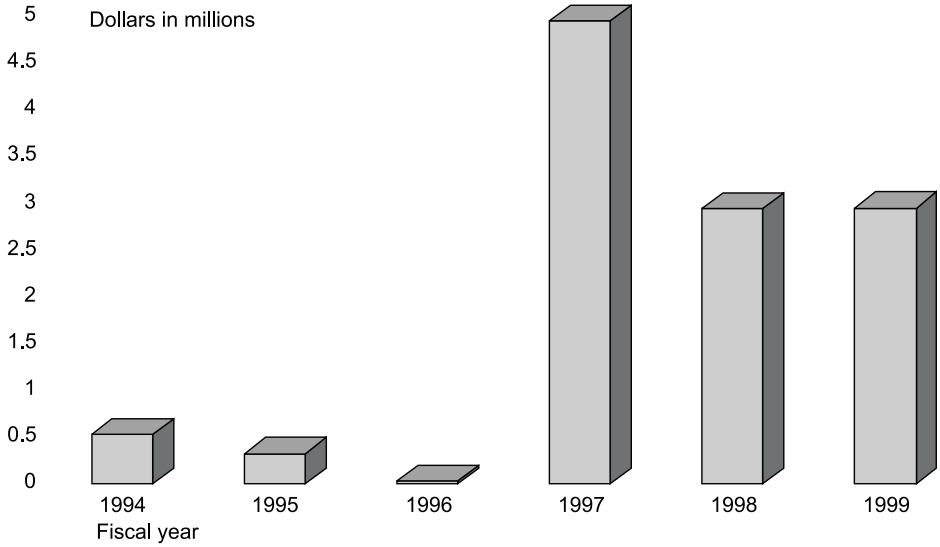
Source: GAO analysis of International Science and Technology Center data.

The research projects have primarily focused on biotechnology research and development projects, including research on new vaccines and environmental remediation. Since 1998, four executive branch agencies have become Science Center partners.[20] As partners, the agencies develop and manage their own collaborative research activities but rely on the Science Center for administrative support, including tax-free direct payments to project participants.

For fiscal years 1994 through 1999, the Department of Energy's Initiatives for Proliferation Prevention has provided $11.7 million to fund 53 biotechnology projects in Russia, Kazakhstan and Ukraine. As shown in figures 6 and 7, the assistance and number of projects implemented have increased dramatically since 1996.

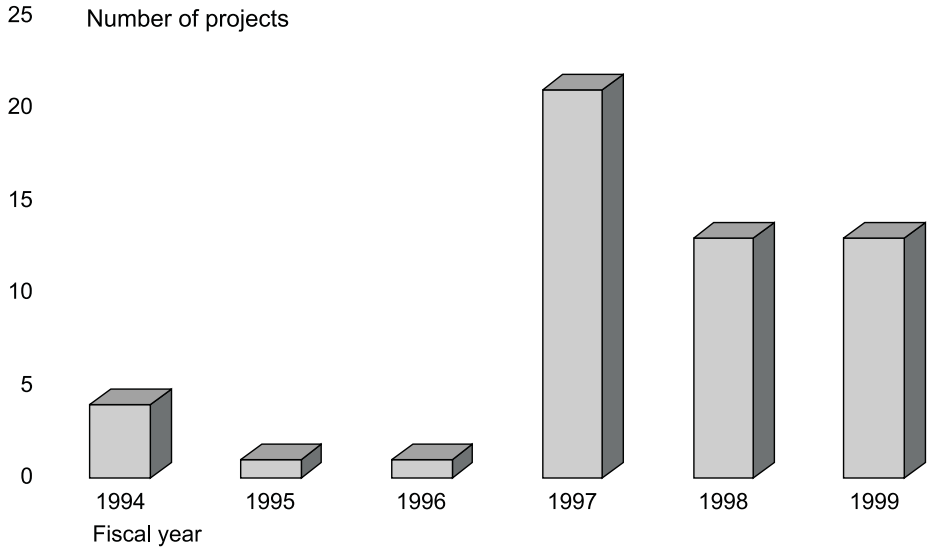
[20]The four executive branch partners participating in biotechnology projects are the Defense Advanced Research Projects Agency, the Defense Threat Reduction Agency, and the Departments of Agriculture and Health and Human Services.

Figure 6: Energy Department Initiatives for Proliferation Prevention Funding for Biotechnology Projects, 1994-99



Source: Department of Energy.

Figure 7: Number of Initiatives for Proliferation Prevention Biotechnology Projects Funded, 1994-99



Source: Department of Energy.

For the Initiatives for Proliferation Prevention program, the assistance totals are divided between the institutes, the U.S. national laboratories that develop and manage the projects, and to support U.S. industries' participation in the program. In 1999, we reported[21] that a considerable portion of program funds—63 percent—was used to pay for the costs of the U.S. national laboratories (51 percent) and to support U.S. industries' participation in the program (12 percent), while about 37 percent was actually provided to the institutes. Program officials stated that the program's use of U.S. national laboratory staff as project managers is essential but noted that as of fiscal year 2000, they have implemented a congressional restriction[22] that limits the laboratories' portion to 35 percent of the total program funding. We also reported that while the Initiatives for Proliferation Prevention program's goal is to redirect former biological weapons scientists to nonmilitary activities that have

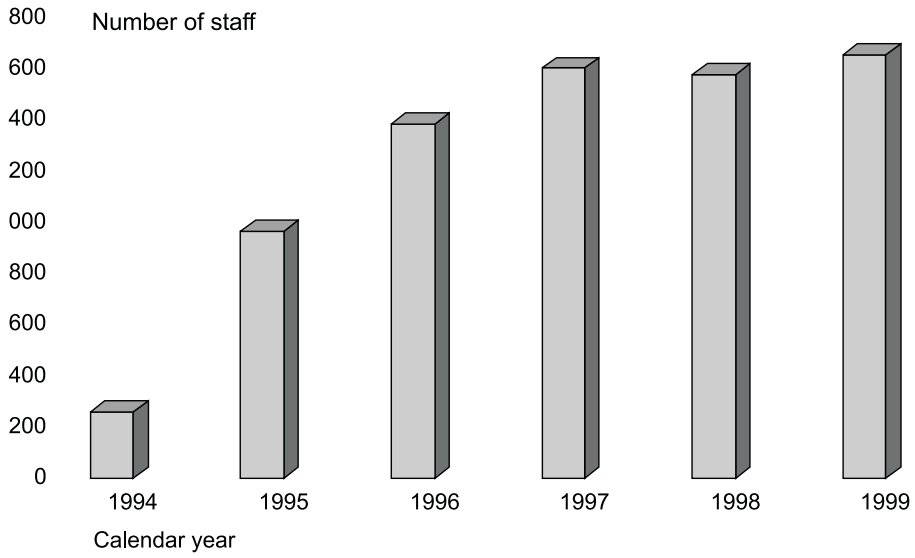
[21] *Nuclear Nonproliferation: Concerns With DOE's Efforts to Reduce the Risks Posed by Russia's Unemployed Weapons Scientists.*

[22] National Defense Authorization Act for Fiscal Year 2000, Section 3136 (P.L. 106-65).

commercial potential, no biotechnology projects to date have resulted in commercialization. To address this issue and enhance the commercial viability of its projects, program officials said that beginning in fiscal year 2000 the program no longer uses the traditional basic research approach of a national laboratory working with a former Soviet institute. Instead, it is emphasizing larger U.S. industry cost-shared projects, whereby corporations agree to fund a portion of the research and development costs.

Senior State, Defense, and Energy Department officials told us the Science Center and Initiatives for Proliferation Prevention programs have helped to discourage scientists from cooperating with countries of proliferation concern and terrorist groups, while promoting openness at more than 30 former Soviet biological weapons institutes. State and Defense Department officials identified at least 15 former Soviet biological weapons institutes in which the United States has evidence that these programs have discouraged the institutes and scientists from cooperating with countries of proliferation concern such as Iran. These officials provided classified evidence that could not be included in this report. However, as an additional measure of performance, they noted that the Science Center database indicates that about 1,655 employees associated with the former Soviet biological weapons program received Science Center funding in 1999 (see fig. 8).

Figure 8: Number of Former Soviet Biological Weapons Staff Receiving Science Center Grants, 1994-99



Source: International Science and Technology Center.

Our analysis of 61 U.S.-funded biotechnology related project plans funded by the Science Center through 1999 indicated that about 745 of the project participants were former senior weapons scientists,[23] while about 910 were a combination of less senior scientists with weapons-related skills and various support staff. According to Science Center project plans, these senior scientists devoted an average of 174 days to Science Center projects. Most of the senior scientists we met with told us they spend between 25 and 75 percent of the year on these projects. Institute directors told us that the Science Center grants were crucial to their institute budgets and that this support helped them retain their core scientific staff. In fiscal year 1999, the Initiatives for Proliferation Prevention program began tracking the number of scientists and level of expertise employed in its program. Program officials from the U.S. national laboratories reported that 570 employees, including scientists and support staff, from former Soviet biological weapons institutes have received funding from 1994 through 1999. Most of the employees worked at institutes located in Russia.

[23]From January 1, 2000, through February 1, 2000, the Science Center funded an additional 87 senior weapons scientists.

Officials from the Departments of State, Defense, and Energy told us that through these collaborative research projects, the United States has achieved some access to more than 30 former Soviet biological weapons institutes in Russia, Kazakhstan, Ukraine, and Armenia. For example, the Science Center has funded projects at 29 institutes, including 19 primary institutes where projects were developed and managed and 10 institutes that provided support. In addition, the Initiatives for Proliferation Prevention program has funded contracts at 15 former Soviet biological weapons institutes, including 10 funded by the Science Center. Of particular significance is that projects funded by the two programs have provided some access to 15 of the 20 former Soviet biological weapons institutes in Russia that are considered key by the State Department.

U.S. project officials said these projects have provided access and openness to facilities and scientists that would not have been available otherwise. The Department of Defense informed Congress in a January 2000 report[24] that the access gained through the collaborative research programs has provided "high confidence" that Biopreparat institutes such as Vector and Obolensk are not presently engaged in offensive activities. During our visits to six institutes in December 1999, institute officials invited us to tour buildings and laboratories associated with U.S.- funded projects. We talked with scientists participating in the programs and were allowed to take photographs. The institute directors reported regular visits from the international community, including congressional delegations, U.S. executive branch officials, Science Center and Initiatives for Proliferation Prevention program and financial managers, scientific collaborators, auditors, and private sector officials.

Another key benefit of the U.S. assistance effort has been the internal dismantlement of the world's largest anthrax production and weaponization facility (see fig. 9) in Stepnogorsk, Kazakhstan, which is on target for completion in May 2000. Dismantlement includes removing all production equipment and capabilities from the facility. Department of Defense officials note that this $4 million project has gone relatively smoothly. They attribute its success to a good working relationship with the Kazakhstan government and a formal implementing agreement that allows for dismantlement activities. Institute officials have recently requested additional U.S. assistance of up to $10 million to totally destroy the production facility. As of March 2000, Department of State and Defense

[24] *Section 1308: Report on Biological Weapons Programs in Russia.*

officials said plans are underway to fund this effort and told us that the total elimination of this production facility would substantially reduce U.S. concerns about a reconstituted biological weapons production capability in Kazakhstan.

Figure 9: Department of Defense's Dismantlement of the World's Largest Anthrax Production Facility in Stepnorgorsk, Kazakhstan

Building 600 (foreground) Research Facility and Building 231 Anthrax Milling and Drying Facility.

"Butterfly" Airflow Valve Outside a Former Biosafety Containment Laboratory.

Discarded "Butterfly" Airflow Valves Removed from Building 231.

Source: Department of Defense.

Biological Weapons Program Broadens Scope and Increases Funding

The initial U.S. program funded a modest effort to redirect former biological weapons scientists to peaceful research. In late 1997, in response to intensified attempts by Iran and other countries of proliferation concern to acquire biological weapons expertise and materials from former Soviet institutes, the United States decided to expand its activities and provide a substantial increase in funds. The expanded program will be funded through the Expanded Threat Reduction Initiative.[25] For fiscal years 2000 through 2004, the executive branch plans to spend about $220 million to further engage former Soviet biological weapons institutes. Approximately half of these funds will be used to continue efforts to redirect scientists toward peaceful civilian research, including participation by the Departments of Health and Human Services and Agriculture as new Science Center partners. In addition, the executive branch has allocated at least $36 million to support research by former Soviet biological weapons scientists on improving defenses against biological threat agents, $40 million to upgrade security and safety of select facilities, and $39 million to destroy biological weapons facilities in Russia as it has done in Kazakhstan—if Russia agrees.

State and Defense Department officials have decided to fund collaborative research efforts with Russian scientists on dangerous pathogens to help improve U.S. military and civilian defenses against biological threat agents. Several Defense Department officials and the former Deputy Chief of Biopreparat told us that former Soviet biological weapons scientists have at least a 20-year lead over the United States in their understanding of biological weapons. Defense officials maintain that this knowledge should be useful in conducting research on how to protect the United States against the use of such pathogens. The Department of Defense will manage its collaborative biodefense research projects through the Defense Threat Reduction Agency's Cooperative Threat Reduction program and the Defense Advanced Research Projects Agency. In addition, the Department of Agriculture also plans to support projects aimed at improving U.S. defenses against the use of agricultural biological weapons such as foot and mouth disease and wheat rust.

[25]The executive branch's Expanded Threat Reduction Initiative, dated April 1999, provides a 5 -year funding proposal (fiscal years 2000-2004) to reduce international security threats associated with the proliferation of weapons of mass destruction from the former Soviet Union.

One important bioterrorism research initiative is the World Health Organization's international research program on smallpox. As part of this initiative, the Departments of Health and Human Services and Defense will provide funds to Russia's Vector institute to research smallpox, a disease supposedly eradicated in 1980. In 1996, the World Health Organization decided to destroy all remaining declared smallpox stocks at the two official repositories—the Centers for Disease Control and Prevention, and Vector. However, concerns that smallpox may have proliferated to countries of proliferation concern or terrorist groups, combined with public health issues, prompted the World Health Organization to delay the destruction of the official stocks until 2002 and focus on medical treatment and prevention. Thus, U.S. officials working with Russian scientists at Vector have developed proposals for research aimed at addressing three key World Health Organization research priorities. These include (1) prompt recognition and diagnosis of the disease, (2) pathogenesis (the process by which a pathogen creates a disease in an organism) using animals, and (3) development of an antiviral drug for smallpox patients. As of March 2000, U.S., Russian, and World Health Organization officials were reviewing at least four projects involving smallpox research with requested project funding of about $5 million.

To reduce the risk that dangerous pathogens could be stolen or accidentally released from former Soviet biological weapons institutes, the executive branch plans to spend $40 million over the next 5 years to provide safety and security upgrades to select facilities. Funding projects through the Science Center, the Department of Defense recently signed agreements to secure facilities at two of Russia's largest repositories of dangerous pathogens—Vector and Obolensk. The security enhancement program will focus on the protection, control, and accounting of biological materials and will be conducted in two phases. Phase I work will include upgrading physical security by installing fences, sensors, and electronic surveillance systems; upgrading safety conditions inside the labs to ensure that future pathogen research is conducted in a safe and reliable manner; and training security personnel. Phase II will involve the development of biological material protection, control, and accounting verification procedures. The estimated cost of the initial security enhancements at Vector and Obolensk will be about $1 million to $1.5 million each. Additional institutes and facilities in Russia and Kazakhstan are being assessed for future upgrades.

The Department of Defense is presently assessing the possibility of providing security upgrades to two repositories of large pathogen

collections in Russia: the Institute for Animal Health (Vladimir) and the Institute of Phytopathology (Golitsino). In addition, the Defense Department has recently awarded contracts for security upgrades at two institutes in Kazakhstan: the Institute for Research on Plague Control in Almaty and the State Research Institute for Agricultural Science. Approximately $4 million has been allocated for the Kazakhstan projects. Department officials hope that once the security enhancement projects are successfully completed in Russia and Kazakhstan, collections from less-protected institutes will be transferred to these facilities for safe and controlled storage.

To reduce the infrastructure of former biological weapons research and production facilities, the executive branch plans to spend $39 million for consolidation and dismantlement of select facilities. Using the Stepnogorsk dismantlement project as a model, the Department of Defense is currently assessing facilities in Russia for future consolidation activities. Defense officials acknowledge that work cannot start on such activities until the Russian government signs an implementing agreement to permit this work. Defense officials continue to seek an agreement with the Russian government; however, they do not yet have one.

The United States Has Taken Steps to Address but Has Not Eliminated All Risk

In attempting to address the primary proliferation risks, the United States may exacerbate some existing risks or create new ones. With Russia's intentions regarding its inherited biological weapons capability still unclear, the United States may exacerbate the risk of a reconstituted Russian offensive biological weapons effort by sustaining these institutes through its funding of collaborative research and other activities. U.S. funding of biodefense research (research that focuses on civilian and military protection against the use of biological agents) poses the particular risk that Russian scientists could sustain or advance their knowledge and skills related to developing dangerous pathogens or biological weapons technologies. While pursuing transparency and compliance provisions in the Biological and Toxins Weapons Convention, the United States has developed a set of safeguards primarily for the institute and individual projects to prevent the misuse of funds or other inappropriate activity. U.S. officials also plan to augment existing safeguards that would mitigate—but not eliminate—the particular risks associated with engaging former Soviet biological weapons scientists in collaborative biodefense research.

U.S. Efforts May Exacerbate or Create Risks, Including Potentially Sustaining Russian Biological Weapons Capabilities

State and Defense Department officials agreed with our observation that sustained U.S. support of institutes, especially through research aimed at advancing U.S. biodefense capabilities, may help to preserve Russian scientists' knowledge and skills and otherwise help to maintain these institutes' capacity to research and develop biological weapons. This view is buttressed by the former Deputy Chief of Biopreparat's belief that the Biopreparat leadership tolerates international funding of its former institutes because it has no funds to do so and this assistance allows the institutes to remain intact and scientifically active in the absence of Russian funding. In addition, a senior Science Center official cited Biopreparat's recent firing of the director of a leading former Soviet biological weapons institute that has received substantial U.S. funding as an example of Biopreparat's continued interest in, and leverage over, the institutes it formerly funded.

In addition to funding the scientists' salaries, the United States is sustaining these Russian institutes by providing research equipment, upgrading safety and security conditions, and improving some other facilities, such as an animal-breeding center, which could theoretically be used to support future research on biological weapons. Besides sustaining Russia's biological weapons capability, the United States may exacerbate or create other types of risks. For instance, (1) U.S. collaborative research funds could be diverted to covert offensive weapons research, proliferation activities, or other inappropriate use; (2) illicit research could potentially take place during a U.S.- funded biodefense or other research project; or (3) Russian scientists working on U.S.- funded biodefense research could potentially advance or maintain their skills relating to weapons-usable pathogens and technologies that could later be applied to offensive weapons research.

The United States Is Taking Several Steps to Mitigate Risks

The United States has taken a number of steps to try to mitigate some of these risks at the national, institute, and project levels in Russia. To address the risk that the United States may be sustaining Russia's biological weapons capability at the national level, the United States continues its efforts to strengthen the Biological and Toxin Weapons Convention to add transparency and compliance provisions, as well as negotiating further agreements with Russia on biological weapons. The Department of Defense has also initiated a dialogue with the Russian Ministry of Defense to increase transparency and address concerns about whether offensive biological weapons work continues at Ministry of Defense facilities, although the United States has not yet achieved access to these facilities. A trilateral inspection regime initiated by the United States, the United

Kingdom, and Russia in 1992 led to inspections of some nonmilitary Russian facilities. However, Russia halted these inspections in 1994 and other steps, such as adding transparency and compliance provisions to the Convention, have not been successful.

For nonmilitary institutes receiving U.S. assistance, U.S. officials said the executive branch is considering a number of "graduation models" whereby institutes would be permanently transformed into self-sustaining entities that the United States would no longer consider to be threat risks and would no longer require U.S. assistance. Such graduation models would build on previous U.S. and international efforts to promote openness, expose these institutes to commercial and other opportunities, and integrate them into the international scientific community. An example of a graduation model currently being considered is the conversion of a leading former Soviet biological weapons institute into a fully transparent international research center attracting scientists from around the world. Officials from the Initiatives for Proliferation Prevention program said they are developing an exit strategy that plans to stop funding new projects by fiscal year 2005 and to successfully commercialize their ongoing projects.

Until an institute graduates into a peaceful, self-sustaining organization, however, the United States will continue to implement safeguards at the institute and individual project levels to mitigate risks. U.S. officials told us that these safeguards are not intended to serve as substitutes for arms control provisions. Prior to the funding of any U.S. collaborative research project, Russian institute officials must pledge that their institute will not perform offensive weapons research or engage in proliferation activities. According to a January 1999 State Department report,[26] engaging in such inappropriate behavior would have an immediate and negative impact on any U.S. assistance. Institute officials with whom we met consistently told us that they are no longer involved in offensive biological weapons activities and that they clearly understand the conditions of U.S. collaborative research assistance. However, this pledge only applies to institutes receiving U.S. assistance and not to those former Soviet biological weapons institutes that do not receive U.S. assistance. Additionally, U.S. assistance to select institutes may allow Russia to

[26] *U.S. Government Assistance to and Cooperative Activities with the New Independent States of the Former Soviet Union, Fiscal Year 1998 Annual Report* (Washington, D.C.: Department of State, Jan. 1999).

reallocate funding to other institutes not receiving U.S. support and to which the United States does not have access.

The United States has implemented a number of safeguards at the project level, including (1) interagency reviews of proposals; (2) financial oversight of projects; and (3) varying degrees of scientific project monitoring based on the perceived risk of the project. Prior to funding projects, the executive branch performs an interagency review of proposed U.S. collaborative research projects to assess policy implications and scientific merit, and to characterize potential dual-use risks. Agency officials incorporate these assessments into their decisions about whether to fund the projects, to amend them to reduce the risk, or to forego them altogether. Because of the concern over sponsoring potentially sensitive dual-use projects, Department of Energy officials said the Initiatives for Proliferation Prevention program will not fund any new projects that have been assessed as high risk. Officials involved in the interagency review process note that the existing review process often takes many months to complete. These officials attributed the delays to the increased number of proposals needing review and the limited staff available to conduct the reviews.

Once a project is underway at an institute, the United States uses several means to guard against the misuse of project funds. Since 1994, the International Science and Technology Center has directly deposited grant payments into project participants' individual bank accounts, which prevents the institutes from diverting funds for unauthorized purposes. In November 1999, the Initiatives for Proliferation Prevention program contracted with a tax-exempt organization to provide a similar direct deposit system for its projects. Program managers from the Science Center review programmatic and financial documents on a quarterly basis, and the Science Center requires a final audit of every project before it releases an overhead payment to an institute. In addition, the U.S. Defense Contract Audit Agency has conducted internal control audits for 10 Science Center biotechnology projects through 1999.[27]

While these projects are underway, the executive branch also monitors projects to ensure that they are implemented according to the project plan and to prevent inappropriate activities from occurring during a U.S.-funded

[27]Our review of the 10 biotechnology audit reports identified various accounting and timekeeping weaknesses, which Science Center officials said they are working with the institutes to address.

project. Executive branch agencies assign a U.S. or international scientist to collaborate with the former Soviet scientists. These scientists monitor the progress of the project, identify any problems, and ensure that the research is of sufficient quality. Although the degree of contact varies, U.S. and international collaborators typically meet with the former Soviet scientists who serve as project managers at least once a year and supplement these meetings through regular email and other communications. We did not, however, evaluate the sufficiency and effectiveness of these safeguards.

Executive branch officials told us that they plan to augment existing safeguards to limit the unintended consequences associated with the expanding U.S. portfolio of biodefense research projects. These officials acknowledge that these steps will mitigate, but not fully eliminate, the risks associated with this type of research. For moderately sensitive projects, the Department of Defense plans to place a former U.S. military biologist in Moscow by May 2000 to provide greater in-country monitoring and oversight for the Department's portfolio of projects, especially during critical research phases of a project. This scientist would travel on a regular basis to institutes where the Department is funding research and review the progress of these projects.

For the most sensitive projects that pose the greatest dual-use risks, the United States will seek to place U.S. scientists in residence at the institute where the research is taking place, according to Defense officials. By focusing research on dangerous pathogens or key technologies relevant to biological weapons, these projects would be the most likely to inadvertently advance Russian biological weapons capabilities. To mitigate this risk, in addition to routine safeguard measures, the U.S. scientists would work in the laboratory side-by-side with their Russian counterparts to advance U.S. confidence about the research and to ensure that the United States receives the same research results. For example, if the smallpox projects are approved, the executive branch plans to place a U.S. scientist at Vector. Similarly, the Departments of Defense and Agriculture plan to seek on-site collaboration for their most sensitive projects. Department of Defense officials told us that they will seek on-site collaboration for projects that either involve research on live animals or that develop new antiviral drugs against known biological weapons. They estimate the cost of an individual collaborator to be about $250,000 per year. They note this could eventually constitute as much as half of the Department's overall collaborative research budget. At this point, however, the United States and Russia have not yet reached an agreement that would

allow U.S. scientists to live and work at Russian institutes. Without such an agreement, Department of Defense officials said they would not fund these sensitive research projects.

U.S. officials said these on-site collaboration arrangements would offer the United States significant oversight; however, they acknowledge that even on-site collaboration does not eliminate all potential risks. In fact, they acknowledge that none of the above safeguards would address the risk that Russian scientists could later transfer their skills and research outputs to offensive activities at facilities that remain closed to the United States. This risk is exacerbated by the fact that safeguards at the national level do not exist and that the United States does not have access to Russian military facilities. Officials from the Departments of State, Defense, and Energy all acknowledge the risks involved in funding former Soviet biological weapons institutes. However, they believe that failing to engage these institutes in collaborative activities represents an even greater risk to U.S. national security by leaving them vulnerable to proliferation.

Agency Comments and Our Evaluation

The Departments of State, Defense, and Energy provided consolidated comments on a draft of this report. The agencies concurred with our report's findings and acknowledge the risks involved in engaging these former Soviet biological weapons institutes, but said that the benefits outweigh the risks. They further stated that it is critical that the United States continue its effort to redirect these institutes and scientists toward peaceful endeavors. Although discussed in our report, the agencies reiterated that (1) access gained as a result of U.S. assistance programs has significantly increased U.S. confidence that the participating institutes are not conducting offensive biological weapons research and (2) the expanded program was not based on an abrupt change in policy or approach, but rather reflects program progressions based on increasing levels of confidence. Joint comments from the agencies are presented in appendix I. The agencies also provided technical comments that were incorporated into the report as appropriate.

Scope and Methodology

To assess the potential risks that the former Soviet biological weapons institutes could pose to the United States, we met with senior executive branch officials from the Departments of State, Defense, and Energy and with senior staff at the National Security Council. We met with nongovernmental experts on biological weapons and nonproliferation

issues at organizations, including the Henry L. Stimson Center and the Monterey Institute of International Studies in Washington, D.C. We collected and analyzed both classified and unclassified reports and related threat information from the federal government, nongovernmental organizations, the media, and other sources. To discuss the history of the Soviet biological weapons program and the threats that it continues to pose, we met with the former Deputy Chief of Biopreparat, who now works in Alexandria, Virginia.

We visited six leading former Soviet biological weapons institutes in Russia where officials informed us that they employ 4,500 staff and about 500 senior scientists with biological weapons backgrounds. State and Defense Department officials identified the six institutes we visited as being representative of the former Soviet biological weapons program. The institutes included the (1) State Research Center for Virology and Biotechnology (Vector) in Koltsovo, (2) State Research Center for Applied Microbiology in Obolensk, (3) State Research Center for Ultra Pure Biopreparations in St. Petersburg, (4) State Research Center for Toxicology and Hygienic Regulation of Biopreparations in Serpukhov, (5) State Research Center for Molecular Diagnostics and Therapy in Moscow, and (6) the Puschino branch of the Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry. At these institutes, we met with directors and scientists to discuss proliferation risks, and we toured the facilities.

To develop information about the U.S. assistance efforts to address these threats, we met with policy and program officials from the three primary departments funding engagement activities as well as other U.S. agencies also involved in these programs. At the State Department, we met with senior officials in the Bureau of Nonproliferation and in the Office of the Coordinator of U.S. Assistance to the Newly Independent States. At the Defense Department, we met with officials in the Office of Threat Reduction Policy, the Defense Threat Reduction Agency, and the Defense Advanced Research Projects Agency. At the Energy Department, we met with Initiatives for Proliferation Prevention senior program officials and also with representatives from the U.S. national laboratories, including the Idaho National Engineering and Environmental Laboratory and the Pacific Northwest National Laboratory. We also met with senior program officials from the Department of Agriculture's Agriculture Research Service and the Department of Health and Human Service's Biotechnology Engagement Program to discuss their planned activities as Science Center partner organizations. In addition, we met with officials at the National Academy of

Sciences and the U.S. Civilian Research and Development Foundation to discuss collaborative research projects they have funded.

In Russia, we met with officials and staff at the International Science and Technology Center in Moscow to discuss project management and oversight issues. At the six Russian institutes we visited, we met with institute directors and scientists receiving U.S. assistance. To determine program benefits, we examined program data from 1994 through 1999 that identified performance measures such as the level of funding provided and the number of scientists and institutes engaged. Although we reviewed classified information provided by the Departments of State and Defense regarding the programs' benefits, we did not include this information in our report. To determine the percentage of scientists that are senior biological weapons experts, we analyzed Science Center database and project plans to calculate the numbers receiving U.S. assistance from 1994 through 1999.

To address the risks associated with the U.S. efforts and the steps the executive branch is taking to mitigate them, we met with officials from many agencies, including the Departments of State, Defense, and Energy as well as the former Deputy Chief of Biopreparat. However, we did not evaluate the sufficiency and effectiveness of these safeguards. We discussed the risks involved in funding biological weapons research and how the United States plans to address these risks. We met with officials from the United States Army Medical Research Institute for Infectious Diseases to discuss scientific collaboration issues. We also met with officials who participate in the interagency review process to discuss the criteria used to review project proposals. We reviewed U.S. Defense Contracts Auditing Agency audit reports on biotechnology projects.

We performed our work from August 1999 through March 2000 in accordance with generally accepted government auditing standards.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 7 days from its issue date. At that time, we will send copies of this report to other congressional committees; the Honorable Madeleine K. Albright, Secretary of State; the Honorable William S. Cohen, Secretary of Defense; and the Honorable Bill Richardson, Secretary of Energy. Copies will also be made available to other interested parties upon request.

If you or your staff have any questions concerning this report, please call me at (202) 512-4128. Other GAO contacts and staff acknowledgments are identified in appendix II.

Harold J. Johnson, Associate Director
International Relations and Trade Issues

Comments From the Department of State

United States Department of State

Chief Financial Officer

Washington, D.C. 20520-7427

April 19, 2000

Dear Mr. Hinton:

We appreciate the opportunity to review your draft report "BIOLOGICAL WEAPONS: Effort to Reduce Former Soviet Threat Offers Benefits, Poses New Risks,"GAO/NSIAD-00-138, GAO Job Code 711425.

The joint comments from the Departments of State, Energy and DOD are enclosed for incorporation in the final report. We directly provided technical changes to your staff.

If you have any questions concerning this response, please contact Ms. Anne Harrington, Office of Proliferation Threat Reduction, Bureau of Nonproliferation, at (202) 736-7696.

Sincerely,

Bert T. Edwards

Enclosure:

As stated.

cc:
GAO/NSIAD – Mr. Kachura
State/NP/PTR – Ms. Harrington

Mr. Henry L. Hinton, Jr.,
Assistant Comptroller General,
National Security and International Affairs,
U.S. General Accounting Office.

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Comments on the GAO Draft Report "Biological Weapons: Effort to Reduce Former Soviet Threat Offers Benefits, Poses New Risks," GAO/NSIAD-00-138, GAO Job Code 711425

This response to the General Accounting Office (GAO) draft report, "Biological Weapons: Effort to Reduce Former Soviet Threat Offers Benefits, Poses New Risks." (GAO Code 711425) includes comments by the Departments of State, Defense, and Energy.

Our review of the draft GAO report finds it technically accurate in most areas evaluated, and concurs with its major findings. While we acknowledge that certain risks are posed by the Administration's efforts to engage former Soviet biological weapons (BW) scientists and institutes in peaceful, civilian research projects, we have acted to manage and reduce those risks to an acceptable level. We believe the benefits far outweigh the remaining risks and that it is critical to continue USG efforts to redirect former Soviet weapons scientists and institutes towards peaceful endeavors. The GAO report correctly observes that the scientific and physical assets of the former Soviet Union's biological weapons program continue to pose a potential proliferation threat because they are sought by countries or terrorist groups seeking biological weapons; they could be engaged by proliferators seeking weapons research capability; or dangerous pathogens could be stolen, sold, transferred or disseminated because of industrial accidents. In their field research, the GAO team responsible for the report observed that economic and security conditions exist for each of these risk scenarios.

As the report notes, USG agencies have taken a number of steps to address the risks associated with funding biotechnology projects. For example, all projects submitted for consideration are subjected to an interagency review process, and projects are funded only if appropriate oversight procedures are in place. Grant payments from the programs are deposited directly into the bank accounts of individual scientists to guard against program funds being redirected for other purposes, and financial audits and technical monitoring are conducted to determine if funds are being used in accordance with the agreed upon work plans. A program that includes managing such risks is preferable to taking no actions, which would essentially

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leave scientists and research institutes completely vulnerable to countries of proliferation concern.

The report fails to note several key factors:

- Transparency and routine access gained as a direct result of these activities have significantly increased US confidence that ISTC and IPP participating institutes are not conducting offensive biological weapons research.

- The expanded program activities highlighted in the report build on a base that was developed over the past five years. The increased program opportunities reflect healthy program progressions founded on increased levels of confidence, not on abrupt changes in policy or approach.

As a result of these programs, we have gained access to over 30 former Soviet biological weapons facilities that would not have been available otherwise, and are poised to engage additional facilities if funding is available. The world's largest anthrax production and weaponization facility is being dismantled and new research is taking place that may help to combat some of the world's most deadly diseases. Institutes with projects funded under the ISTC and IPP programs are aware of the immediate, negative impact inappropriate behavior on their part would have on US assistance. Additionally, officials of at least fifteen research institutes participating in these projects have indicated that they have refused offers from countries of proliferation concern to begin questionable research as a result of US assistance efforts.

The agencies whose views are presented in this response appreciate the opportunity to comment on the draft report. Additional technical comments have also been provided.

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GAO Contacts and Staff Acknowledgments

GAO Contact

Boris L. Kachura, (202) 512-3161

Acknowledgments

In addition to those named above, Andrew D. Crawford, Valérie L. Nowak, Jodi M. Prosser, and Pierre R. Toureille made key contributions to this report.

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