

USAWC STRATEGY RESEARCH PROJECT

**AN OVERVIEW OF THE U.S. COOPERATIVE
THREAT REDUCTION PROGRAM FOR BIOLOGICAL
WARFARE AGENTS IN THE FORMER SOVIET UNION**

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This SRP is submitted in partial fulfillment of the requirements of the Master of Strategic Studies Degree. The U.S. Army War College is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools, 3624 Market Street, Philadelphia, PA 19104, (215) 662-5606. The Commission on Higher Education is an institutional accrediting agency recognized by the U.S. Secretary of Education and the Council for Higher Education Accreditation.

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U.S. Army War College
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Report Documentation Page

*Form Approved
OMB No. 0704-0188*

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 18 MAR 2005	2. REPORT TYPE	3. DATES COVERED -			
4. TITLE AND SUBTITLE An Overview of the U.S. Cooperative Threat Reduction Program for Biological Warfare Agents in the Former Soviet Union		5a. CONTRACT NUMBER			
		5b. GRANT NUMBER			
		5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S) Kathleen Carr		5d. PROJECT NUMBER			
		5e. TASK NUMBER			
		5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army War College, Carlisle Barracks, Carlisle, PA, 17013-5050		8. PERFORMING ORGANIZATION REPORT NUMBER			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)			
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)			
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT See attached.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 29	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

ABSTRACT

AUTHOR: Colonel Kathleen Carr
TITLE: An Overview of the U.S. Cooperative Threat Reduction Program for Biological Warfare Agents in the Former Soviet Union
FORMAT: Strategy Research Project
DATE: 18 March 2005 PAGES: 29 CLASSIFICATION: Unclassified

The fall of the Soviet Union signaled the end of the Cold War and brought great relief to many, who, as a result, felt that the threat of mutually assured annihilation from weapons of mass destruction (WMD) has been relegated to the waste bins of history. The demise of the former power did not, however, signal an end to the weapons themselves. Given the size of the Soviet Union's chemical, biological and nuclear weapons arsenal, the flowering of terrorist operations, and flourishing materiel transfer networks around the globe, vulnerability to WMD confronts the United States as its number one security concern. To secure the WMD specifically in Russia and the states of the former Soviet Union (FSU), the U.S. implemented the Nunn-Lugar Cooperative Threat Reduction (CTR) Program in 1991. This program is designed to assist the FSU states with the security, destruction and dismantling of these weapons in order to keep them out of the hands of non-rational actors and countries of concern. While laudable in intention, the program in the area of biological weapons (BW) production demonstrates questionable strategy and effectiveness. Progress has been slow and uneven, despite twelve years of effort and an influx of \$7 billion; unintentional consequences may result if certain participants do not make substantive changes. This paper will describe the overarching CTR guidance, US policy for BW counterproliferation in Russia and select states of the FSU, the interagency role in BW CTR, the challenges facing the BW CTR and recommendations for facilitating an effective counterproliferation program for the FSU's BW program.

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ACKNOWLEDGEMENTS

The author wishes to gratefully acknowledge the contributions of the staff of the Defense Threat Reduction Agency for access to their extensive library of reports. A special thanks also goes to Ned Taylor, John Wright, Chris Royce and Lieutenant Colonel Brent Bredehoft, U.S. Army, for their critical reading of the document.

AN OVERVIEW OF THE U.S. COOPERATIVE THREAT REDUCTION PROGRAM FOR BIOLOGICAL WARFARE AGENTS IN THE FORMER SOVIET UNION

Preventing a biological weapons attack—long a terrifying battlefield danger and now a serious threat to civilian populations as well—is a major contemporary global security priority.

- Kenneth Luongo

It's not a question of if, but when...

- former Senator Sam Nunn

BACKGROUND ON BIOLOGICAL WEAPONS COOPERATIVE THREAT REDUCTION

The misuse of science and technology is no longer a hypothetical exercise restricted to the B-reels of Hollywood archives. Recent history, to include the anthrax mailing attacks of late 2001 and discovery of al Qaeda literature on biological pathogen processing, demonstrates that terrorists are willing and able to use biological agents as weapons of terror. Preventing the spread of biological weapons (BW) has been a challenge as these agents can be researched in small laboratories without a significant footprint, are easily cached and transported without detection and can be affiliated with legitimate, defensive scientific programs.

The former Soviet Union's offensive BW program was of enormous scope and size and contributed substantially to their weapons of mass destruction (WMD) arsenal. The government had over 1.5 million scientists on its payroll with 60,000 to 65,000 of those employed in the area of BW research.¹ The Soviets conducted an offensive BW program in five Ministry of Defense (MoD) facilities and over 45 other sites hidden within the Ministries of Agriculture, Science, Medicine and the nominally commercial network of Biopreparat.² A staggering amount of resources was focused on agents capable of being weaponized and used against people, plants and animals.

Since the fall of the Soviet Union, there is a very real threat of terrorists maliciously using diverted material from the Soviet's substantial stockpiles of dangerous biological materials. Poorly secured, deteriorating sites with under- and un-employed scientists provide terrorists with potential access to usable WMD materials and the talent to develop new agents. Delivery of these materials against military or civilian populations is a major security concern of the United States, and prompted the President to publish, for the first time, the National Strategy to Combat Weapons of Mass Destruction.³ The emerging U.S. strategy to combat the proliferation of biological and other WMD is built on a foundation of proactive counterproliferation efforts,

strengthened nonproliferation efforts and effective consequence management activities.⁴ Derived from the National Strategy to Combat WMD, the counter- and nonproliferation strategies emphasize prevention of acquisition of such materials by state and non-state actors through diplomatic means, multilateral agreements, nonproliferation programs and, if warranted, export controls and sanctions.⁵

The Nunn-Lugar Cooperative Threat Reduction (CTR) program is a nonproliferation program specific to the United States and was initiated in 1991 by former Senator Sam Nunn and Senator Richard Lugar. It provides monies, expertise and technology to Russia and selected states of the former Soviet Union (FSU) for securing, safely dismantling and destroying WMD.⁶ The Nunn-Lugar program in the early 1990's provided an important foundation to the emergence of a comprehensive national strategy to address the concerns of WMD. The BW counterproliferation efforts began in earnest in 1998,⁷ headed by three U.S. agencies. The Department of Defense (DoD) is the lead for assisting Russia, Uzbekistan, Georgia and Kazakhstan dismantle, destroy and safely transport its WMD, to include BW agents. The Department of Energy (DoE) is primarily involved in the security aspects of the FSU's nuclear material and nuclear warheads, but has a tangential role in BW detection. A third participating U.S. agency is the Department of State (DoS), which oversees programs that pay scientists formerly employed in offensive WMD efforts to conduct peaceful research.⁸ The inordinately slow progress of the BW CTR program is undoubtedly linked to the lack of a clearly defined agency leader for the effort; the three organizations appear to be cooperatively focused on the end state of the program but suffer from a lack of written, BW-specific, overarching policy and strategy. If the program is to enjoy any kind of real progress, Congress and the President must appoint and support a lead agency or oversight entity; the threat is too real to continue at the faltering, sluggish pace.

Reducing the risk of BW proliferation is clearly an important U.S. national security interest, but to do so, the CTR program expends tens of millions of U.S dollars annually⁹ and has come under criticism for inadequate intent, approach, accountability and effectiveness.^{10 11 12} The DoD's CTR program, run by the Defense Threat Reduction Agency (DTRA), has experienced decidedly mixed results depending on which of the states in the FSU is engaged. For instance, the BW CTR programs in Georgia, Kazakhstan and Uzbekistan have made tangible progress due largely to the extensive cooperation exhibited by those governments' officials. Indeed, these three nations have already participated in multilateral science and technology programs and are engaging many of their scientists in transparent and sustainable research projects funded through the CTR program.¹³

The CTR program scenario is less rosy in Russia. It suffers from a pointed lack of transparency, high-level involvement and cooperation from Moscow. There are accusations that Russia ignores any mutual interest in BW threat reduction and continues to flaunt the Biological and Toxin Weapons Convention (BWC),¹⁴ a 1972 treaty that outlaws the development, production and stockpiling of pathogens and toxins for offensive purposes and to which the former Soviet Union and the U.S. are signatories. Similarly, Russia does not pay for its agreed-upon share of CTR program costs, often nullifying any steps put in place in the accessed laboratories.¹⁵ Much of the shortcomings come from a disjointed U.S. CTR program that is too permissive with Russian accountability, lacks enforceable policies and misunderstands Russian domestic interests.^{16 17}

THE FORMER SOVIET UNION BW MACHINE

The prolific and enormous BW network created by the former Soviet regime employed between 60,000 and 65,000 workers, occupied over 50 BW institutes and had significant assets tied up in scale-up production, delivery technologies and BW weaponization expertise.^{18 19} The network was comprised of three areas, which helped conceal their activities from the West as well as each other. The first area was within the MoD and researched highly hazardous BW materials such as Marburg virus and anthrax bacteria that were too dangerous for work at other BW facilities. The Russian MoD continues to run the four acknowledged laboratories and continues to bar access to the U.S. CTR officials.²⁰ The second set of facilities identified thus far is the six agricultural laboratories that developed pathogens related to plants and animals.²¹ These laboratories have not yet received the full scrutiny of the CTR, but their importance is obvious when evaluating the impact of animal-specific pathogens such as Foot and Mouth Disease on the economy of a country like Great Britain. The third, and largest, BW complex was that run by Biopreparat. This network employed over 35,000 workers at approximately 45 sites to conduct what was termed “commercial civilian” microbiological activities.^{22 23} The term “commercial” is used loosely because, despite lobbying for U.S. pharmaceutical investments, Biopreparat’s main (and, ultimately, sole) customer was the Russian MoD.^{24 25}

Identifying the whereabouts of many of the former BW experts is a challenge. The drastic reduction in funding to the laboratories left many of the leading scientists possessing specific weapons-relevant skills without jobs, vulnerable to hiring by non-rational actors and posing a proliferation risk.^{26 27} The DoS handles a piece of the CTR program that funds—with financial input from the European Union, Japan and Canada—projects (and thus scientists’ salaries) for non-proliferative scientific endeavors. This multilateral endeavor for re-direction of the scientists

is run through the International Science and Technology Center in Moscow and the Science and Technology Center in the Ukraine.²⁸ The programs found work for many of these scientists,²⁹ but access to all scientists (especially ones of Russian origin) is admittedly limited.^{30 31} This calls into question the validity of Russian and U.S. claims that the key scientists of interest are gainfully employed and not recruited into offensive programs of other organizations/nations.

Safeguarding and securing the vast network of Soviet BW facilities and the agents stored therein were primarily the responsibility of the MoD and used massive amounts of manpower.³² The guns, gates and guards employed for these purposes have all deteriorated significantly and the agents are vulnerable to internal and external theft. The U.S., led by the DTRA CTR program, is attempting to upgrade security at the FSU biological institutes, but only as participants are willing. To date, in Russia only two, albeit the largest two, of the former BW facilities have had significant security upgrades installed: Vector, where the smallpox virus is stored, and Oblensk, where anthrax research is performed.^{33 34} The remaining facilities are either closed to U.S. access or subject to long-delayed schedules for security assessments.

Security activities in the other states of the former Soviet Union are more mature. After the Russians left with BW agents and delivery weapons in the 1990's, the infamous BW production plant in Stepnogorsk, Kazakhstan, is undergoing CTR-sponsored demilitarization and destruction.³⁵ The Russians claim to have destroyed the agents and weapons they removed, but will not provide verification.³⁶ Other facilities in Kazakhstan are undergoing security assessments as jurisdiction and funds allow. In Uzbekistan, the concerns were about the status of Vozrozhedeniye (Voz) Island, the Soviet's open-air testing site located between Kazakhstan and Uzbekistan in the middle of the Aral Sea. The contaminated environment, shrinking Aral Sea and poor physical condition of the facility raised fears of not only theft, but unintentional transport of agent by migratory animals and widespread environmental pollution.³⁷ The U.S. is assisting Uzbekistan with decontaminating Voz Island and dismantling the entire facility; this DTRA-led project is underway and will alleviate the security vulnerability posed by the facility when complete.³⁸ Despite these noted successes, the glacial pace in Russia for a seemingly simple process jeopardizes achieving totality of U.S. CTR goals anytime soon.³⁹ The U.S. leadership, in conjunction with its CTR partners, must insist on Russian cooperation and openness.

THE U.S. BW COUNTER THREAT REDUCTION PROGRAM

No one U.S. agency is clearly appointed as the overarching lead in BW CTR efforts, but the DoD's Defense Threat Reduction Agency functions as the program's primary

implementation arm. Established in 1998, DTRA is a result of consolidation of the Defense Special Weapons Agency, the Defense Technology Security Administration, the On-Sight Inspection Agency, the congressionally mandated Nunn-Lugar CTR program and the Chemical Biological Defense Program.⁴⁰ Day-to-day operations of DTRA are overseen by the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. DTRA has four core missions: (1) threat control, (2) threat reduction, (3) combat support, (4) technology development to support the other three missions.⁴¹ Public Law 103-160, DoD Directive 2060.2, "Department of Defense Counterproliferation Implementation", and four different arms control treaties dealing with WMD provide DTRA with implementation authority for its inspection program.^{42 43} Oversight of the CTR program is nominally through the Congressionally-directed Counterproliferation Program Review Committee (CPRC). The CPRC, with the DoD as the chair, has participation from the Department of Energy, the Director of Central Intelligence and the Joint Staff⁴⁴ and reports directly to Congress. The CPRC ensures that the participating agencies function within the parameters of the national strategic objectives and policies centered on countering the proliferation of WMD. One agency absent from the CPRC is the DoS, which is a major stakeholder in the BW CTR program; they participate in an ad hoc basis but should be formally included in the CPRC. Other interagency organizations (technical working groups and policy coordinating committees) engage in complementary (e.g., chemical and nuclear) WMD counterproliferation, consequence management and counterterrorism efforts.⁴⁵ Given the stated responsibilities and high-level participation, the CPRC should, but apparently does not, exert more interagency control over the U.S. BW CTR program. Rather, the CPRC appears to be more focused on internal U.S. organization research, development and acquisition objectives. Adding the DoS as a permanent member to the CPRC may extend the focus of the group on to more international issues. If the CPRC were to become a truly integrating body for the U.S. BW CTR program and express a more robust authority aimed at international—read Russian—targets (as well as U.S. interagency partners), it would certainly provide clarity of effort and message.

BW CTR PROGRAM EXTERNAL TO THE DOD

The expertise required to effectively implement the United States' BW CTR is diverse. While the DoD has the primary lead in the effort, the Departments of State and Energy are also important partners in the counterproliferation program efforts. Other entities are choosing to become engaged, to include U.S. government and non-government organizations and international coalitions.

The U.S. has provided assistance since 1994 to scientists, technicians and other laboratory workers previously engaged in offensive WMD work in the former Soviet Union. The DoS has led this effort through funding of research grants and other programs via two centers referenced earlier: the International Science and Technology Center in Moscow, founded in 1992,⁴⁶ and the Science and Technology Center in Ukraine, founded in 1995.⁴⁷ These tax-free grants are deposited directly into the accounts of the participating personnel and involve funding work in the areas of public health or other peaceful research efforts.^{48 49} This DoS-administered program has expanded to include collaborative projects with other agencies in the U.S., namely the National Academy of Sciences, the DoD's Defense Advanced Research Projects Agency, the Department of Agriculture, the Department of Commerce, the Environmental Protection Agency and entities within the Department of Health and Human Services.⁵⁰ Figures cited in 2003 claim that more than 40 former Soviet facilities have participated, involving over 3,500 scientists and \$135 million in research grants.^{51 52}

Because its expertise is focused mainly in areas of nuclear technology, the DoE participates to a lesser degree in the BW CTR program. However, the DoE does assist the DoD with BW detection and identification technologies for treaty verification activities. It also provides assistance in the area of dual-use technology identification and export control of these technologies.

Non-governmental organizations (NGO's) are becoming more involved in nonproliferation efforts and contribute to BW threat reduction through active collaborations with universities, U.S. industries and multinational corporations. Two notable NGO's, the United States Industry Coalition and the Civilian Research and Development Foundation for the Independent States of the Former Soviet Union are non-profits that facilitate mutually beneficial collaborations between matched research partners. Funds for the projects come from both government contracts and private foundations, and projects are vetted to complement the interests and needs of the involved participants.⁵³

While the U.S. is a primary driving force behind BW CTR in the FSU, other countries and government alliances are contributing to this effort. Their contributions are comparatively small or immature, and are further addressed in the recommendations section of this paper.

ANALYSIS OF CTR CHALLENGES AND POLICY

The challenges to formulating and implementing an effective BW CTR program are daunting. Traditional policy tools are ineffective in preventing proliferation of BW with a willing

aggressor for reasons related to the nature of microbiology research, the role of treaties and the players involved.

The line between defensive and offensive biological research is easily blurred since the equipment, facilities and materials used are essentially the same. Applying the concept of dual use technologies means that a legitimate vaccine research center and an illegitimate BW production facility may co-exist under the guise of a commercial venue (e.g. the Biopreparat complex). Distinguishing between the two is a delicate task and depends on the cooperation and demonstrated intent of the state(s) involved. Also, detecting a dangerous microorganism cannot be accomplished in real time (yet), thus diversion and use of the microbes against human, animal or plant targets is possible without an effective intervention. The biotechnology advances that enable sophisticated genetic manipulation of microbes coupled with weapons-related technologies signal a need for flexibility and vigilance in present and future BW CTR efforts.⁵⁴

The effect of nonproliferation agreements and treaties is arguably negligible. A particular example is the BWC, enacted in 1972 which the U.S. used as a vehicle to dismantle its own offensive BW program. The treaty created political, moral and legal reasons for discontinuing the activities of the signatories.⁵⁵ Despite signing the original treaty, the Soviet Union and Iraq continued to conduct offensive BW programs until the 1990's, calling into question the relevance of the BWC. Efforts began in 1994 to strengthen the BWC's verification provisions through a draft protocol proposing full facility disclosures, inspections and field investigations of disease outbreaks. The U.S. voiced opposition to these provisions, citing concerns for protection of proprietary information and potential for intelligence gathering by agents of states of concern (e.g., Russia, China, Pakistan, Iran, and Israel).⁵⁶ The U.S. felt that the BWC did nothing to provide effective tools for countering BW proliferation and withdrew its support from the draft protocol in July of 2001.^{57 58}

The role and attitudes of the players involved in BW CTR programs is of paramount importance and concern. Russia and the former Soviet states constitute a particularly serious challenge and proliferation risk because of their economic distress, the significant assets of the former offensive program and, in the case of the Russians, very limited cooperation.⁵⁹ The financial issues, in particular, have led to deterioration in the physical security of the sites and a large number of unemployed, unpaid scientists from the FSU with extensive BW expertise.^{60 61} Despite the U.S. actively redirecting the programs, the "brain drain" from the laboratories was significant, with one laboratory losing 54% of its staff.⁶² The U.S. may have unintentionally exacerbated this problem with elimination of plants in Kazakhstan and Uzbekistan –an action

that improved security, but left scientists without work.⁶³ The economic hardships and potential availability of these bioweapons experts were noticed by the Iranian government, who actively recruited them in the 1990's.^{64 65} Besides financing scientists' salaries through grants, the U.S. has also provided over \$14 million to improve the physical security at 4 of the 49 sites identified in Russia, installing external security measures at two of the four facilities.⁶⁶ However, the Russians, despite signing a multilateral agreement to do so, are unable or unwilling to provide the resources for the security systems' maintenance and upkeep.⁶⁷ This lack of cooperation is also evident in the steadfast refusal to allow U.S. (namely DoD) access to many former Soviet BW sites. Difficulty in negotiating access is certainly due to the need to interact with nine separate Russian government organizations to obtain permission.^{68 69} The Russians also insist on certain controls over their program that go against the BW CTR program's intent. They state they are justified in barring access in the interest of national security; detractors feel this is a tact to conceal the former BW program, or even a covert ongoing offensive program.⁷⁰ Lengthy negotiations have yet to show progress in achieving a resolution on facility access.⁷¹

The BW CTR programs in Kazakhstan, Uzbekistan and Georgia are more progressive than in Russia, but are not without their own sets of significant challenges. Kazakhstan and the U.S. signed a bilateral agreement in December 2004 that provides \$35 million for study projects related to preventing bioterrorism. However, implementing the agreement is presently in jeopardy as the Kazakhs are insisting on much more control over the steps to consolidate pathogens, secure their repositories and accommodate the U.S. demands for unfettered access to their facilities.⁷² While not blatantly uncooperative, the Kazakhs are undoubtedly weary of the intrusive relationship with and academically condescending attitudes of the U.S. They have openly spoken of a need for additional financial support to convert the former BW facilities to peaceful production activities.⁷³ This need for funding is also true in Uzbekistan and Georgia, where the scope appears to be somewhat smaller, but no less worrisome than in Kazakhstan. Involved scientists of all three nations are also eager to embark upon projects beneficial to public health or commercial industries and are chafing against the U.S. CTR program's narrow field of focus. These latter challenges of insufficient funding and restricted research are not solely the fault of the U.S. and beg for expanded participation from other nations, industry and academia. A final critical point is that all of these countries are subject to political instability, thus continuity of programs is at risk when changes in regimes occur.

Not all challenges for implementing an effective BW CTR program lie with the governments of the FSU. The U.S. also brings conflicting attitudes, unfocused policies and a lack of understanding of the nations' interests and concerns. The U.S. insists on transparency,

(yet refuses reciprocity), and the mandatory full disclosure of the FSU's biodefense programs does not consider their need to protect proprietary or security information. This seems a legitimate concern, harkening back to the reasons that the U.S. would not sign the verification provisions of the BWC.

The U.S. also has been exceptionally slow in articulating a written policy for agencies participating in security assistance and nonproliferation activities at BW facilities. The National Strategy to Combat Weapons of Mass Destruction is a broad document without specifics from which to derive detailed policies and plans. The process of creating a draft policy began in 2002,⁷⁴ but has not yet emerged from the DoD. Similarly, the DoD presently lacks a written plan to address its assistance in securing the biological sites in the FSU.⁷⁵ Without a concrete policy, the U.S.'s BW CTR program can be, and has been, applied in a seemingly haphazard, unidirectional manner. Disagreements resulted over intent while frustration fomented over progress among the participants. The U.S.'s BW CTR program also suffers from the chaos inherent in a lack of leadership within the interagency process, where, despite a group of willing partners, uneven assistance and conflicting priorities and standards are applied. As a result, the affected states in the FSU often perceive the program as heavy-handed, condescending,⁷⁶ yet unfocused and uneven in its level of enforcement. The sense of mistrust on both sides of the table is prevalent, disruptive and a probable hold-over from the Cold War.⁷⁷

RECOMMENDATIONS FOR EFFECTIVE CTR PROGRAMS

Traditional first-line counterproliferation efforts include scrutiny of export and import controls, on-site inspections, sanctions, and destruction of WMD materials and/or weapons. All of these measures have merits when the involved actors are sincere players. Other methods must be employed that are tailored to the type of program involved, demonstrate how it may be transformed to peaceful activities, and consider the societal/political intent of the players. The following are recommendations on how to improve upon the well-intended project of turning former weapon-manufacturing centers into research centers for peaceful purposes.

To gain momentum, the BW CTR program must expand to actively recruit other international players. Threat reduction against WMD has always been more than a strictly U.S.-FSU endeavor. The G-8 countries have contributed increasing amounts of monies to the effort since 2001. The Australia Group, a loosely-affiliated body of 33 countries to which the U.S. (but not Russia) belongs, has harmonized its dual-use policies for export controls on equipment and materials involved in chemical and biological weapons production.⁷⁸ Other professional, economic or security-based organizations have banded together to attempt to counter the traffic

in dangerous pathogens or technologies directly related to BW development.⁷⁹ These multinational groups are just beginning to gain compliance with BW CTR policies by states of the FSU through exertion of economic, technologic and scientific pressures.⁸⁰ As the European Union (EU) becomes a dominant player on the world stage, its involvement should be encouraged, if not demanded, as a supplement to the existing efforts. EU expertise –and funds–would be a valuable contribution in the area of biological safety and establishment of EU-centric biotechnical parks at critical sites.⁸¹ The EU also provides the advantage of ease of mobilization, economic clout from a coordinated multinational body, geostrategic objectivity and experience in developmental transition.⁸² Genuinely international initiatives such as these would put a global face on the BW CTR efforts and transform the FSU states from dependent recipients to self-sustaining partners.

Members of the international commercial pharmaceutical industry comprise an under-used resource for providing opportunities for economic and scientific stabilization to the FSU. These entities could provide re-employment of scientists and economic incentives to pursue commercial and/or public health endeavors while engaging the extensive network of Russian facilities. Anecdotally, the scientists of the FSU states are eager to engage in health care research and provide protection of the populace in their respective countries;⁸³ partnerships with multinational pharmaceutical corporations and government agencies (i.e., World Health Organization) would provide mutual benefits. Additionally, affordable pharmaceuticals and integration into global health networks are almost guaranteed outcomes.

The resistance from elements of the FSU to the BW CTR process is evident in their lack of transparency, barring of access to facilities, and their exceptionally slow pace in dismantling the physical assets of their BW program.⁸⁴ This is especially true in Russia and to a lesser extent in Kazakhstan, Uzbekistan and Georgia. Their stance probably stems from a low level of trust in the process by the FSU states' officials as well as concerns of losing control over the agents, facility access and scientific freedom. A confidential exchange of information on the scope and nature of the facilities in question is an absolute necessity; proprietary interests of these states must be protected if they are to be competitive in commercial markets. The U.S. must recognize the FSU states' interests in the areas of economic incentives, research autonomy, biological safety and biological security. The incentives for compliance must be positive (such as economic rewards), not punitive. This will be easier and cheaper to enforce than the present policing mechanisms, and more in line with a model to build a productive biotechnology industry capable of competing in the global marketplace.

Because of the reluctance of the Russians to cooperate with transparency and openness, standard approaches appear to be of questionable value in their case. A U.S.-led, multinational effort is required that will compel the Russians to comply or face tangible, effective, and possibly painful, consequences. Resoundingly absent from the Kremlin is the consistent, willing leadership, present in other former Soviet states, intent on dismantling WMD programs. The Putin government must exert command emphasis to change the truculent attitudes of the multiple ministries involved or fire the people currently at their helms (reportedly the same who ran the offensive weapons programs).⁸⁵ They must reveal the extent of their programs and agree to not just continue to take the security and safety upgrades offered by the BW CTR, but also to take control of the maintenance of such systems when installed. The inability of the Russians to uphold their financial obligations associated with the CTR program because of economic duress is an opportunity for bodies such as the EU to participate in an endeavor of mutual interest. This must be encouraged by the U.S. and Russia. Financial reparations could be made once the laboratory systems become solvent through commercial activities. Barriers to information by way of stove piping are also a serious setback in accessing the Russian programs. As many as nine different government agencies appear to have jurisdiction over the former BW program centers in Russia,⁸⁶ each with independent access policies, program directives and viewpoints on the nonproliferation efforts. It has been a fruitless effort on the part of the U.S. to conduct separate negotiations with each of the nine agencies to implement the BW CTR program⁸⁷ and a single, highly placed Russian entity that controls these facilities is a crying need. In the end, the U.S. must hold Russia to a higher standard of compliance than is presently being enforced and insist on agreement on BW CTR policies at the highest levels of leadership.

The U.S. will also benefit from employing several recommendations. First, the U.S. must direct the BW CTR program from one unambiguous authority, the DoD being the most logical candidate. Next, the U.S. must publish a unified policy and blueprint based on objectives mutually developed with the involved countries. From that, the countries must employ an implementation agreement with advocacy by the countries' leaders and extensive involvement of the scientific communities. The one-sided nature of the current endeavor without a published U.S. policy has produced little tangible benefits for either party despite an enormous outlay of capital,⁸⁸ questioning the program's balance of ends, ways and means. The U.S. must address each country's concerns about losing scientific, proprietary and economic control of their products. There can be no doubt that the efforts by each party are for their mutual benefit and that the program will lead to self-sufficient independence of the biodefense programs of the FSU

states. To continue the heavy-handed, unilateral approach risks damaging U.S. credibility and threatens its ability to create an effective strategy in defending against WMD proliferation.

The U.S. BW nonproliferation program is directed at the former Soviet Union's expansive BW program and is now in its thirteenth year. The program is in keeping with the President's goals for the U.S. strategy to combat WMD, but has significant challenges. In the FSU, the mission risks strangulation by resource constraints, restricted access to facilities, and the vastness of the FSU's military and civilian biological research infrastructure. The U.S. contributes to these challenges with no clear, overarching BW CTR governance and the lack of published U.S. policy and plan for the BW CTR. The demise of the program could signal an upsurge in the proliferation of BW by state and non-state actors. Thus, review and changes to the program are warranted in order to increase cooperation and effectiveness in BW counterproliferation efforts. A successful U.S. strategy leverages the former Soviet BW program to make substantial contributions to the region's public health and global security.

WORD COUNT= 4905

ENDNOTES

¹ Kenneth N. Luongo, "Building a Forward Line of Defense Securing Former Soviet Biological Weapons," *Arms Control Today* 34, no. 6 (2004): 18.

² Jonathan B. Tucker, "Chemical and Biological Weapons," in *Repairing the Regime*, ed. Joseph Cirincione (New York: Routledge, 2000), 217-18.

³ George W. Bush, *The National Strategy to Combat Weapons of Mass Destruction* (Washington, D.C.: The White House, December 2002), 3-4.

⁴ For the purposes of this paper, definitions for counterproliferation and nonproliferation are taken from Joint Publication 3-40, *Joint Doctrine for Combating Weapons of Mass Destruction*, dated 8 July 2004. *Counterproliferation* applies to those actions taken to prevent proliferation, stop or roll back current WMD programs, defeat delivery systems, and protect U.S. interests from the threat of or use of WMD. Counterproliferation activities are principally applied after adversaries develop WMD, but they can also be applied early on in the WMD development and acquisition stages. *Nonproliferation* refers to using the full range of diplomatic, economic, informational and military instruments of national power to prevent the development and proliferation of WMD. It is principally applied to prevent the acquisition or development of WMD by state or non-state actors during the early WMD development stages.

⁵ Bush, *The National Strategy to Combat Weapons of Mass Destruction*, 4-5.

⁶ Richard G. Lugar, "Nunn-Lugar Cooperative Threat Reduction Program," 11 August 2004; available from <<http://www.lugar.senate.gov/nunnlugar.html>>; Internet; accessed 26 August 2004.

⁷ General Accounting Office, "Testimony 03-526T, Weapons of Mass Destruction: Observations on U.S. Threat Reduction and Nonproliferation Programs in Russia," 5 March 2003; available from <<http://www.gao.gov/atext/d03526t.txt>>; Internet; accessed 26 August 2004.

⁸ General Accounting Office, *Report 03-482, Weapons of Mass Destruction: Additional Russian Cooperation Needed to Facilitate U.S. Efforts to Improve Security at Russian Sites* (Washington, D.C.: U.S. General Accounting Office, March 2003), 3.

⁹ General Accounting Office, *Report 00-138, Biological Weapons: Effort to Reduce Former Soviet Threat Offers Benefits, Poses New Risks* (Washington, D.C.: U.S. General Accounting Office, April 2000), 5-6.

¹⁰ *Ibid.*

¹¹ Duncan Hunter, "Representative Hunter Charges Waste in U.S. Threat Reduction Aid to Russia," 4 March 2003; available from <<http://usinfo.state.gov/xarchives/display.html>>; Internet; accessed 26 August 2004.

¹² Justin Bernier, "The Death of Disarmament in Russia?" *Parameters* 34, no.2 (Summer 2004): 85.

¹³ Department of State Fact Sheet, "U.S. Assistance to Uzbekistan—Fiscal Year 2004," 17 August 2004; available from <<http://www.state.gov/p/eur/rls/fs/35992.htm>>; Internet; accessed 12/13/2004.

¹⁴ Kathleen C. Bailey, "Why the United States Rejected the Protocol to the Biological and Toxin Weapons Convention," October 2002; available from <<http://www.nipp.org/>>; Internet; accessed 26 August 2004.

¹⁵ General Accounting Office, *Testimony 03-526T*.

¹⁶ Ibid.

¹⁷ Bernier, 86.

¹⁸ Luongo, 19.

¹⁹ General Accounting Office, *Report 00-138*, 9-14.

²⁰ Ibid.

²¹ Luongo, 19.

²² Ibid.

²³ Bernier, 86-7.

²⁴ Ibid.

²⁵ Luongo, 19.

²⁶ Ibid.

²⁷ General Accounting Office, *Report 01-582, Weapons of Mass Destruction: State Department Oversight of Science Centers Program* (Washington, D.C.: U.S. General Accounting Office, May 2001), 3.

²⁸ Department of State Fact Sheet, "U.S. Assistance to Kazakhstan—Fiscal Year 2004," 17 August 2004; available from <<http://www.state.gov/p/eur/rls/fs/35987htm>>; Internet; accessed 13 December 2004.

²⁹ Lugar.

³⁰ General Accounting Office, *Report 01-582*, 5.

³¹ General Accounting Office, *Report 00-138*, 8-9.

³² General Accounting Office, *Report 03-482*, 49, 53-55.

³³ Ibid.

³⁴ Bernier, 86.

³⁵ Michael Roston, "Accomplishments of Selected Threat Reduction and Nonproliferation Programs in Russia, By Agency," May 2002; available from <<http://www.ransac.org>>; Internet; accessed 13 December 2004.

³⁶ Lauren Arestie, "The Russian Biological Weapons Complex," March 2003; available from <<http://www.ransac.org>>; Internet; accessed 13 December 2004.

³⁷ Ibid.

³⁸ Michelle Stem Cook and Amy f. Woolf, *Order Code RL31368, Preventing Proliferation of Biological Weapons: U.S. Assistance to the Former Soviet States* (Washington, D.C.: Congressional Research Service, The Library of Congress, 10 April 2002), 6.

³⁹ General Accounting Office, *Report 03-482*, 49.

⁴⁰ General Accounting Office, *Report 04-330, Weapons of Mass Destruction: Defense Threat Reduction Agency Addresses Broad Range of Threats, But Performance Reporting Can Be Improved* (Washington, D.C.: U.S. General Accounting Office, 13 February 2004), 7.

⁴¹ Ibid., 8.

⁴² General Accounting Office, *Report 00-97, Weapons of Mass Destruction: DoD's Actions to Combat Weapons Use Should Be More Integrated and Focused* (Washington, D.C.: U.S. General Accounting Office, May 2000), 46-57.

⁴³ Department of Defense, *Department of Defense Counterproliferation Implementation, Department of Defense Directive 2060.2* (Washington, D.C.: U.S. Department of Defense, 9 July 1996).

⁴⁴ Counterproliferation Review Committee, *Report on Activities and Programs for Countering Proliferation and NBC Terrorism* (Washington, D.C.: U.S. Department of Defense, May 2002), 1.

⁴⁵ Counterproliferation Review Committee, *Report on Activities and Programs for Countering Proliferation and NBC Terrorism* (Washington, D.C.: U.S. Department of Defense, May 2004), 2-3.

⁴⁶ General Accounting Office, *Report 00-138*, 8.

⁴⁷ Department of State Fact Sheet, "U.S. Assistance to Kazakhstan—Fiscal Year 2004," 17 August 2004; available from <<http://www.state.gov/p/eur/rls/fs/35987htm>>; Internet; accessed 13 December 2004.

⁴⁸ Ibid.

⁴⁹ Center for Counterproliferation Research, *Toward a National Biodefense Strategy* (Washington, D.C.: National Defense University, April 2003), 21.

⁵⁰ Cook, 9-12.

⁵¹ Ibid.

⁵² General Accounting Office, *Report 01-582*, 5.

⁵³ Cook, 13.

⁵⁴ Center for Counterproliferation Research, 4.

⁵⁵ Michael Moodie, "Reducing the Biological Threat: New Thinking, New Approaches," in *Chemical and Biological Arms Control Institute Special Report 5* (Washington D.C.: Chemical and Biological Arms Control Institute, January 2003), 5.

⁵⁶ Center for Counterproliferation Research, 19.

⁵⁷ Ibid.

⁵⁸ Moodie, 15.

⁵⁹ General Accounting Office, *Report 03-482*, 9-10.

⁶⁰ Center for Counterproliferation Research, 20.

⁶¹ Tucker, 220-23.

⁶² Ibid.

⁶³ Luongo, 18.

⁶⁴ Center for Counterproliferation Research, 20.

⁶⁵ Tucker, 219.

⁶⁶ General Accounting Office, *Report 03-482*, 10.

⁶⁷ Center for Counterproliferation Research, 20.

⁶⁸ General Accounting Office, *Report 03-482*, 52.

⁶⁹ General Accounting Office, *Report 00-138*, 30.

⁷⁰ General Accounting Office, *Report 03-482*, 48.

⁷¹ Bernier, 88.

⁷² Bureau of International Information Programs, "Kazakhstan Signs Agreement to Prevent Spread of Bioweapons," 10 December 2004; available from <<http://www.globalsecurity.org/wmd/library/news/Kazakh/Kazakhstan-041210-usia01.htm>>; Internet; accessed 13 December 2004.

⁷³ Gulbarshyn Bozheyeva, *Former Soviet Biological Weapons Facilities in Kazakhstan: Past, Present and Future* (Monterey, CA: Center for Nonproliferation Studies, June 1999), 26.

⁷⁴ General Accounting Office, *Testimony 03-526T*.

⁷⁵ General Accounting Office, *Report 03-482*, 12.

⁷⁶ COL Erik Henchal, U.S. Army, telephone interview by author, 14 September 2004.

⁷⁷ Luongo, 20.

⁷⁸ Jonathan B. Tucker, "Preventing the Misuse of Pathogens: The Need for Global Biosecurity Standards," *Arms Control Today* 33, no. 5 (June 2003): 8.

⁷⁹ Kenneth N. Luongo, "Reform and Expansion of Cooperative Threat Reduction," *Arms Control Today* 33, no. 5 (June 2003): 13.

⁸⁰ *Ibid.*

⁸¹ Luongo, 19.

⁸² Kathryn Hohl, *EU Cooperative Threat Reduction Activities in Russia* (Paris: Institute for Security Studies, June 2003), 40-43.

⁸³ Mr. Edwin Taylor, Science Applications International Corporation, interview by author, 30 December 2004, Springfield, VA.

⁸⁴ General Accounting Office, *Report 00-138*, 10.

⁸⁵ Amy E. Smithson, "International Cooperation to Prevent Biological Weapons Research and Development," *Public Health Today* 116, Supplement 2 (2001): 24.

⁸⁶ General Accounting Office, *Report 03-482*, 53.

⁸⁷ *Ibid.*, 56.

⁸⁸ *Ibid.*

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