

CHAPTER 1

BEYOND NUNN-LUGAR: CURBING THE NEXT WAVE OF WEAPONS PROLIFERATION THREATS FROM RUSSIA

Working Group on U.S.-Russian Nonproliferation Cooperation

Foreword.

With so many analyses already available of U.S.-Russian cooperative threat reduction efforts, it is not obvious why one should bother with yet another. There are, however, three good reasons for doing so. First, with the recent warming in U.S.-Russian relations, it makes sense to review what is clearly the current mainstay of existing U.S.-Russian cooperation—the one billion dollars per year worth of government-funded Nunn-Lugar programs—to see what can be done better. Certainly, if the Cooperative Threat Reduction Program’s worthy objectives can be better achieved, this, in turn, should enhance the prospects for increased U.S.-Russian security cooperation generally. Of course, the reverse is also true.

Second, although there is broad support to continue these programs, there is a growing divide between the programs’ backers and their critics as how best to proceed. Among the programs’ supporters, the key recommendation is to spend substantially more on existing projects. Critics of the programs’ defense conversion efforts, however, insist

that these projects be made self-sustaining as soon as possible.

Finally, since September 11, 2001, the inventory of threats that the United States and Russia need to cooperate on reducing has clearly grown.

Overview.

The current centerpiece of U.S.-Russian security collaboration is the Nunn-Lugar Cooperative Threat Reduction Program. Costing nearly a billion dollars annually, this effort and the projects it supports have run for nearly a decade now and gained the kind of political, bureaucratic, and budgetary support that has all but institutionalized them. Indeed, not only are they likely to continue for many more years, their success or failure has become identified with the future of U.S.-Russian cooperation generally.

Looking at the current state of these programs, it is easy to see why. On the one hand, they have succeeded in helping Russia pay for the dismantlement and securing of a significant number of deployed strategic weapons systems and related research, production, and storage facilities. What they have yet to extend to, however, are the most worrisome of Russia's strategic weapons activities—Moscow's continued proliferation of missile and nuclear technology exports to those nations still at odds with the United States, e.g., Iran, Iraq, and China.

Thus, at the very time Nunn-Lugar supporters were trying to secure \$316 million more in funding, Russian President Vladimir Putin signed a major security treaty of friendship with China and a \$300 million arms deal with Iran. Russian nuclear and missile cooperation with Tehran, moreover, continues. Indeed, some now believe that Iran is so far along in its nuclear missile efforts that, even if Russia cut off all further assistance, Tehran could deploy a long-range nuclear system in the next 5 to 8 years. As for

Iraq, Putin recently sent an official delegation to meet with Iraqi President Saddam Hussein to assure Baghdad of Moscow's continued interest in resuming arms sales and military cooperation just as soon as the United Nations sanctions are lifted.

As U.S.-Russian cooperative threat reduction efforts succeed or fail in demilitarizing and controlling the further spread of U.S. and Russian strategic weapons capabilities, then, so too does the fate of U.S.-Russian security cooperation generally rise or fall. Beyond Russia and the United States backing the goals of Nunn-Lugar and acting in good faith, though, success in these efforts also requires sound cooperative programs and proper implementation. In this regard, congressional hearings, General Accounting Office studies, and several official reviews have highlighted a number of concerns. Among these are:

- U.S. assistance to demilitarize Russia's strategic weapons production and research institutes has been so poorly monitored that, in some cases, it could have actually helped to maintain Russia's weapons capabilities;
- The metrics for these programs' success and failure are egregiously vague;
- Despite years of spending to encourage defense conversion, there is little to show in the way of commercial Russian venture enterprises;
- The costs to the U.S. taxpayer for many of the defense conversion programs are growing despite congressional calls for the executive branch to devise ways to defederalize their support.

This listing of worries brings us to the last reason that a reassessment of the cooperative threat reduction programs is warranted. After September 11 and a decade of implementing the current crop of Nunn-Lugar programs, the list of threats U.S.-Russian threat reduction

cooperation must now address has grown. In 1991, the immediate proliferation concern was the likely spread of Russia's existing nuclear weapons materials and long-range missile expertise to Iran or Iraq. Now, U.S.-Russian cooperative threat reduction efforts need to address at least three other longer-term worries:

- As the number of infectious diseases and their ability to spread quickly increases, insufficient effort will be made to detect their outbreak early and precisely enough in the United States and Russia to ascertain whether the epidemic was natural or the result of terrorist or state action, and to limit the harm that might otherwise be done to the general populations.

- Several factors will only increase the risks of nuclear theft and terrorism: the huge and growing stockpiles of nuclear weapons materials in the United States and Russia from dismantled weapons; the significant remaining uncertainties regarding these and civilian holdings (particularly in Russia); and the proposed conversion of surplus weapons plutonium into reactor fuel.

- Lacking the ability or interest to create private sector employment opportunities, Russia will again find its best and brightest drawn to the security and prestige of working in Russia's weapons-related facilities and government, thereby becoming further estranged from the West and indifferent or hostile to U.S. and allied proliferation concerns.

None of these longer-term concerns is yet a major focus of existing U.S.-Russian cooperative threat reduction programs. Nor has much been done to explain how currently supported programs will be able to meet the growing list of congressional effectiveness criteria, including these programs' ultimate defederalization.

The report that follows, which is the result of over 2 years of planning, some 13 commissioned studies, and the

participation of over 30 Russian experts, attempts to address each of these issues.

What makes this report different from other studies of U.S.-Russian nonproliferation cooperation is its use of competitive strategies analysis. Rather than focusing merely on current events, this methodology encouraged the study's participants to concentrate on the security challenges and opportunities the United States and Russia would face over the next 10 to 20 years. Use of competitive strategies analysis also forced the study's working groups to consider how **differences** in U.S. and Russian security aims and strategies might help guide future nonproliferation cooperation. Finally, rather than focusing on ways to shore up the weaknesses in existing cooperative threat reduction efforts, the use of competitive strategies helped the working groups to determine how U.S. and Russian strengths might be pitted against enduring weaknesses to suggest new, sounder paths of nonproliferation cooperation. An additional objective of this study was to suggest leveraged cooperative efforts that could be paid for within existing or significantly **reduced** levels of funding.

The study's participants and commentators suggested four specific undertakings:

- **First, the United States and Russia should work immediately toward the joint deployment of a health monitoring system to detect outbreaks of infectious disease.** The deployment of such a system would serve two purposes. First, it would permit timely protective actions to be taken in the event of biological agent attacks against civil or military populations. In this regard, establishing such a system would help support the objectives of the Biological Weapons Convention (BWC). Also, expanding such a monitoring system to include other nations is a task that former Russian biological weapons-related experts might undertake as a peaceful alternative enterprise. Second, joint deployment could help the United States and

Russia determine how best to address Russia's own growing health concerns, which if not properly addressed could jeopardize not only Russia's future vitality, but the health of nations that have routine contact with Russia.

- **Second, the United States and Russia should coordinate plans to have Russia receive U.S.-origin spent reactor fuel from other nations for a fee, for getting a more accurate inventory of Russia's nuclear weapons and nuclear weapons-usable materials holdings, and for jointly forswearing the chemical separation of plutonium for commercial or nuclear weapons purposes.** U.S. and Russian officials have already discussed how lucrative commerce in spent fuel storage (worth as much as 15 billion dollars over the next decade) could be used to help pay for critical Nunn-Lugar programs. This business, however, would require Washington's approval since it would mainly involve nuclear fuel of U.S. origin. Before granting such permission, the United States should secure Russia's cooperation to get a more accurate inventory of Russia's existing civil and military nuclear holdings. Securing and sharing such inventory data are essential: without it, neither Russia nor the United States will be able to learn how well their other nuclear cooperative threat reduction efforts are reducing the risk of illicit proliferation and nuclear theft. In addition, the United States should condition such commerce on Russia's willingness to reduce the flows of nuclear weapons-usable materials (as the United States has already done) by forswearing chemical separation of plutonium for civilian or nuclear weapons purposes.

- **Third, the United States, the European Union, and Russia need to cooperate much more extensively to increase the quality and number of student exchanges.** If U.S.-Russian cooperative threat reduction efforts are to lead to true lasting defense conversion, it is essential that Russia's most talented youth not be drawn to

work in Russia's military-industrial-research sectors simply because no better alternatives exist. A recent poll of Russian university students indicates that over a third would consider working in closed nuclear cities, while over 60 percent of the very best students would choose to work in one of Russia's state enterprises. This must change. To accomplish this, however, requires awareness among Russia's youth of civilian private sector alternatives not yet present in Russia. This can most easily be secured through exchanges with the United States and Europe where such alternatives are common. Unfortunately, to date the numbers of such exchanges have been far, far too low.

• **Finally, to the extent possible, those cooperative nonproliferation programs that cannot be privatized should be paired with transparent cooperative defense conversion programs that can.** The idea here is initially to help pay for cooperative programs that cannot be privatized with profits from those that can. In time, this approach would also give Russians and Americans a profit motive to pressure their governments to complete those cooperative threat reduction programs that cannot make money. Finally, this approach might help reduce concerns that monies invested in or raised by cooperative defense conversion projects might indirectly end up supporting those Russian weapon-related activities that the projects are supposed to replace.

Each of these recommendations, along with the analysis they were based upon, is presented below.

Key Assumptions.

In assessing what should guide U.S.-Russian nonproliferation cooperation efforts over the next 2 decades, the study's working groups tried first to understand in what relevant ways Russia's foreign policy and military views might differ from those of the United States. This analysis produced three major findings:

• **Russia's foreign policy agenda and non-proliferation concerns in the mid- and short-term are likely to be very different from those of the United States.** Whereas the United States will continue to want to maintain global order, Russia will see its ability to influence events in its near abroad (i.e., Central Asia, the Balkans, and the Baltic states) as being critical to maintaining national authority over its own diverse populations and territories. Thus Russia (particularly its military) is very likely to remain sensitive to expansion of the North Atlantic Treaty Organization (NATO). In addition, Moscow will see strategic cooperation and good relations with Iran, Iraq, India, and China as being in its short- and mid-term interest to help it maintain influence over Russia's relatively unstable periphery.

• **Russia's long-term foreign policy and non-proliferation concerns, though, are less likely to clash with those of the United States.** There are two reasons why. First, over the next 2 decades, Russia by itself will be unable to compete economically (and thus militarily) with China. It could subordinate itself in some loose alliance with China against the United States and its European and Asian allies. Or Russia could cooperate more closely with the West to gain the economic skills and capital to become a more vital nation in its own right. Second, Moscow will naturally have a good deal to lose if states on its periphery (e.g., Iraq and Iran) increase their military might to a point where the United States or its allies are compelled to intervene.

• **Russia only partially shares Washington's views regarding nuclear weapons and nuclear power.** While the Russian military is willing to reduce the number of strategic weapons Russia deploys, it sees continued deployment and enhancement of its theater nuclear weapons systems as being critical to shore up inadequacies in Russia's conventional forces. With regard to civilian nuclear power, Russia is eager to save (and expand)

as much of its current nuclear infrastructure as possible and believes it can do so through nuclear exports to such nations as India and Iran (nations to which the United States has blocked U.S. nuclear exports on nonproliferation grounds). Russia also hopes to make money providing spent fuel storage and reprocessing services to other nations even though the United States has been uneasy about both the further expansion of civil reprocessing and increased international commerce in nuclear weapons-usable fuels.

In addition to identifying these differences, the study's working groups used competitive strategies analysis to pinpoint U.S. and Russian strengths and weaknesses relevant to devising and guiding future cooperative nonproliferation initiatives. This gave rise to the following determinations:

- **The United States should continue to tie U.S. cooperation with Russia to the latter's ending its missile and nuclear assistance to Iran but recognize that doing so may no longer be as rewarding as it once might have been.** As already noted, Iran has received so much nuclear and missile assistance over the last decade that some analysts believe that cutting off all further Russian assistance now may have only a negligible impact on Iran's ability to deploy long-range nuclear systems. This doesn't mean that the United States should stop calling on Moscow to end all assistance. The United States should indeed continue to help slow these programs down. What Washington must recognize, however, is that the days when demanding this might keep Iran from achieving ballistic or nuclear capability may be past. Indeed, Iran is now so close to development of these capabilities it may be difficult for the United States and its allies to know for sure whether Russia had cut off all further assistance **even if it had**. In any case, Russia's good behavior now would be unlikely to prevent the current regime in Iran from developing long-range nuclear systems. Thus it is important that if the United States or Russia

proposes any major new forms of nonproliferation cooperation, they be tied to some more ambitious mutual nonproliferation goal than preventing Iran from acquiring the means to deploy long-range nuclear arms.

- **The most promising areas for future non-proliferation cooperation are most likely to be in the health and nuclear waste management fields.** In these two areas, U.S. and Russian strengths and weaknesses complement one another. In the United States, high quality medical services are readily available but America's public health institutions have fallen into disuse. In contrast, the health and vitality of Russia's population are shaky and projected to get worse. Russia, on the other hand, still has an extensive public health system left over from the Soviet era, but it is poorly equipped. As for Russia's most advanced medical and pharmaceutical research institutions, too many in the past have been connected with biological and chemical weapons work. When one turns to nuclear power, the U.S. Government is more interested in maintaining its nuclear infrastructure than expanding it. Russia, on the other hand, believes it must expand its nuclear exports simply to keep its nuclear industry alive. With Russia selling its reactors to a shrinking market for a fraction of the prices charged by its Western competition, though, it is unclear how profitable such business will be. This explains Russia's interest in getting into the nuclear waste management business, which is potentially worth many billions of dollars and for which there clearly is a market. Indeed, Western demand for spent fuel storage services is quite high. What Russia lacks, however, is the enabling authority needed to receive a good portion of the world's spent fuel, which, because of its U.S. origin, cannot be moved without Washington's consent.

- **Future efforts to convert Russian strategic weapons expertise and assets into profitable civilian enterprises will have to rely less on U.S. taxpayer largesse and reflect less optimism concerning the**

Russians' near-term drive or ability to create private businesses. Although Nunn-Lugar programs remain popular, draft legislation this fall made it clear that the U.S. House of Representatives expects the program's defense conversion projects to be defederalized within 4 years. Implicit in this demand is the expectation that after 4 years of support, defense conversion projects should be self-sustaining private enterprises. The problem here is the U.S.-Russian track record: the United States has too often pushed projects the Russians have not fully supported, while U.S. and Russian government officials have too frequently promoted projects that lacked serious business plans or sound management. The moral of this experience is basic: if entrepreneurial forces are to be harnessed in Russia to spur defense conversion, it will not be the result of U.S. Government decisions or management. Instead, it will require major reform of Russia's tax, legal, and financial systems to make them far friendlier to the creation of small and medium private enterprises than they are today. In addition, it will require the creation of many more able Russian entrepreneurial managers (particularly in the high technology sectors) to draw Russians (and Russia) away from their historical attraction to large, command-style enterprises run by the state. As a practical matter, such structural changes will take time and will require selective mutual exposure between the right Russians and the appropriate Americans and Europeans.

Additional Analysis and Recommendations.

In keeping with this guidance and the previously noted findings, the study's working groups made the following recommendations:

First, the United States and Russia should work immediately toward the joint deployment of a health monitoring system to detect outbreaks of infectious disease. The objects of deploying such a system would be to enhance enforcement of the BWC, improve the health of

Russia's citizens, and assure early detection in the United States and Russia of the **natural** spread of deadly infectious diseases and of bioterrorist attacks.

The George W. Bush administration recently requested that the members of the BWC support the World Health Organization's health surveillance program. The World Health Organization has been working to promote international monitoring of infectious disease for years. The problem is that, so far, it has only been able to get its membership to monitor and report on three sicknesses—yellow fever, plague, and cholera. The reporting, moreover, is generally limited to information regarding **confirmed** outbreaks, rather than the type of preliminary data needed to contain such outbreaks in a timely fashion.

This sort of reporting conservatism may make sense to an underdeveloped nation fearful of losing tourism dollars, but it makes no sense if you need early warning of the possible outbreak of a **vast array** of infectious diseases **before** they spread out of control.

The U.S. Government understands this. That is why following the anthrax letter attacks of the fall of 2001, it supported the expansion of an inexpensive and proven reporting system already working in New Mexico known as the Rapid Syndrome Validation Project (RSVP). RSVP uses computers, touch-screen entry, and the Internet to enable doctors to make speedy reports to public health authorities when they encounter patients who have a particular set of symptoms. A report can be filed in less than a minute. The system assumes no prior knowledge of exotic diseases and covers over 90 percent of the diseases a biological weapons attack might inflict. The program is also cheap. A basic U.S. national system of 1,000 stations could be set up for approximately \$5 million; a crude global system of 10,000 reporting stations for approximately \$20 million.

The immediate benefit of deploying this system beyond U.S. borders would be to improve public health reporting internationally. Certainly, anything the United States or

others do in this respect could support the health surveillance efforts of the World Health Organization. The long-term payoff would be to establish a baseline from which to detect unusual events, such as bioterrorist attacks or epidemics. These could then be identified early enough to allow actions to be taken to prevent harm from coming to any nation's general population.

In Russia's case, the benefits of deploying such a system, though, would be more substantial. Russia's population is not healthy, and it is projected to get much, much sicker. Indeed, Putin highlighted this point last year when he cited Russia's declining population (a decrease of 750,000 people per year) as one of the nation's most serious problems. Analysis commissioned by this study forecasts a Russian population decline by approximately 50 million (i.e., over 30 percent) over the next half-century. The most important cause for this demographic decline is the deteriorating health of Russia's population. The incidence of HIV/AIDS, tuberculosis, hepatitis C and B, and syphilis are all on the rise. This has had and will continue to have a major impact on the health of all sectors of Russia's population.

To reverse these trends, it is critical that Russia's public health authorities be able to detect and monitor new outbreaks of infectious diseases early and precisely enough to locate their sources and take appropriate measures before they further harm Russia's population. This conclusion is one now becoming apparent to both U.S. and Russian officials. In fact, late in the summer of 2001, after this study's working groups recommended joint deployment of RSVP, several working group participants contacted senior U.S. and Russian officials who evinced interest in backing such an undertaking. One idea currently being considered is using Russian biological research institute scientists to help deploy the system in Russia. Assuming they gain the experience they need, these experts could then provide their services in deploying RSVP to other nations for a fee. The profits from this activity eventually could be

used to help support the operation of RSVP within Russia itself.

Second, the United States and Russia should coordinate plans to have Russia receive U.S.-origin spent reactor fuel from other nations for a fee, while getting a more accurate inventory of Russia's nuclear weapons and nuclear weapons-usable materials holdings and jointly forswearing the chemical separation of plutonium for commercial or military purposes.

In the late 1990s, a private group of U.S. representatives from the environmental, business, and national security communities known as the Nonproliferation Trust, Inc., proposed to store foreign (i.e., non-U.S., non-Russian) spent fuel in Russia and use the revenues thus raised for a variety of cooperative threat reduction programs and other causes.

Russia's Duma and Russia's nuclear industrial organization, Minatom, have both shown considerable interest in this proposal. So have German and U.S. officials. Under the scheme, the United States would have to give Russia permission to receive U.S.-origin spent reactor fuel from Europe, Taiwan, and South Korea. These countries' utilities would then pay Minatom a fee for storing the spent fuel in dry storage casks for 40 years.

Assuming a proper customer base, this business should generate as much as 15 billion dollars in revenue. Of this figure, approximately 3 to 4 billion dollars would be needed to transport and store the spent fuel. This would leave over 11 billion dollars that could be used to support a variety of Nunn-Lugar programs and other causes. The Nonproliferation Trust has already proposed to use this money to provide for Russian fissile material security (1.5 billion dollars), construction of a Russian spent fuel repository (2 billion dollars), environmental clean-up (3 billion dollars), salaries for Minatom workers (1.8 billion dollars), and humanitarian causes and pensions (2 billion

dollars). Each of these activities and their funding would be overseen and audited by a corporate board that would include prominent U.S. national security and environmental experts as well as Russians.

Clearly, implementing this proposal could go a long way toward paying for some of the more expensive critical cooperative threat reduction efforts. In addition, these monies could keep a significant portion of Minatom's staff employed and do so **without** raising proliferation risks.

This last point, however, is not assured. Minatom would like to get into the business of chemically separating plutonium from spent reactor fuel and using it to make mixed oxide uranium-plutonium fuels for power reactor use. Such a business is so unprofitable, though, that no private investor has offered to fund it. More important, such fuel services would initiate the transit of thousands of nuclear weapons' worth of nuclear weapons-usable materials all over Russia and much of the world. Certainly, if the United States and Russia are serious about reducing the threat of nuclear terrorism and theft, this is not a business their cooperative threat reduction efforts should promote. At a minimum, none of the monies that might be raised through implementation of the Nonproliferation Trust idea should help finance such activities.

But there is more cause for concern. Russia is still producing nuclear weapons-usable materials. Compounding this nuclear threat is the dearth of knowledge regarding Russia's current nuclear weapons material holdings. Although Russia has declared 50 tons of weapons-grade plutonium to be in surplus, very little is known about Russia's total military inventory of nuclear weapons materials. Thus, in 1999, senior U.S. Department of Energy officials privately conceded that the United States knew only to within 30 percent (plus or minus) what this figure might be. That's a big number, one equivalent to approximately 23,000 advanced thermonuclear weapons' worth of material, i.e., nearly four times the amount of

material contained in all of the strategic nuclear warheads the United States has deployed.

Again, if the United States and Russia are serious about reducing the threat of nuclear terrorism, nuclear theft, and nuclear proliferation generally, these uncertainties about Russia's nuclear holdings are unacceptable. Certainly, it makes no sense to pay for and focus so much on the storage and disposition of 50 tons of surplus nuclear weapons material if well over ten times as much may exist unaccounted for. Just as implementation of the Nonproliferation Trust proposal should be conditioned upon Russia's offering a pledge to forgo nuclear weapons or civilian reprocessing, implementation should not proceed unless the United States and Russia first reach some understanding about what their nuclear weapons materials holdings actually are.

This understanding ought to be more than an oral agreement. Specifically, implementation of the Nonproliferation Trust proposal should be tied to clarifying and reducing existing uncertainties. This means that both the United States and Russia will have to be more forthcoming about sharing nuclear inventory information and opening up facilities to mutual or international inspection than they have been to date. These conditions are a price worth paying. Indeed, the potential financial and nonproliferation benefits of proceeding with the Nonproliferation Trust proposal are too great not to insist that these conditions be met.

Third, the United States, the European Union, and Russia need to cooperate much more extensively to increase the quality and number of student exchanges.

As already noted, many of Russia's best and brightest university students find the prospect of working in the government's military research industrial complex more attractive than facing the obstacles and risks associated with seeking private employment or starting private

civilian businesses of their own. Clearly, no lasting defense conversion can occur so long as this is the case. These Russian students' current attraction to working for state enterprises is partly due to the impressive number of legal and financial obstacles erected by the state against private entrepreneurs. They also are aware of the risks and costs imposed on such ventures by state-supported corruption that preys upon the profitable. By contrast, employment in state enterprises seems to offer a far more certain and attractive future. Wages may be low, but the social benefits of such employment—e.g., free housing, access to quality health care and education, daycare, and subsidized food, etc.—are still substantial.

Finally, and perhaps most important, most Russians have developed a work ethic that is ill-suited for private enterprise. The top-down directive style of management, so common during the Soviet years, is still popular and all too effective in stifling the kind of initiative and responsibility private businesses require of their employees. Also, there is the matter of Russian tolerance of and cultural sympathy for cheating, which makes accountability and sound accounting—both essential to any private enterprise—nearly impossible.

These and other anti-business cultural traits, of course, are learned and can be undone. To do so, however, Russia's best and brightest youth need relevant, first-hand exposure to the West. Conversely, those American and European students most interested in Russia need to understand how Western business practices, the rule of law, management techniques, etc., can be introduced into Russia without being stymied by ingrained cultural norms. This dictates vigorous student and youth leadership exchanges.

The numbers of Russian students (high school students, undergraduates, and post-graduates) currently enrolled each year in the United States (over 5,000), the United Kingdom (approximately 2,500), Germany (approximately 900), and Australia (approximately 800) are not

insignificant. Still, they are paltry in comparison to the number of visiting Chinese students, who last year exceeded 100,000 in the United States alone. In fact, the per-capita rate of visiting Russian students is far below that of many lesser nations. Also, only a small percentage of advanced Russian students that attend U.S. schools and return to Russia get an opportunity to work in serious career-related jobs while they are in the United States. More important, roughly 85 percent of these visiting Russian students are 19 years or older, i.e., well beyond the age of adolescence when one's social habits are still very much being formed.

There are a variety of reasons why the number of Russian students enrolled in universities in Europe and the United States is so low, and why the number of Russian high school students enrolled in these countries is lower still. Russian students must first learn English (or German) to make their visits worthwhile. It has often been difficult for Russians to get Russian academic credit for the work they do overseas (particularly if they attend less rigorous American high schools). Outside Moscow, Russian students have less knowledge of the benefits of becoming an exchange student.

But perhaps the most important impediment to increasing the number of Russian high school students visiting the West is the appalling insufficiency of U.S.-Russian student exchange programs. In 1992 when the United States Congress passed the "Freedom Support Act" for Russia, it authorized 20 million dollars to fund what it hoped would be over 15,000 U.S.-Russian high school exchange students a year. In addition, it provided another 30 million dollars to fund a similar number of undergraduate and graduate exchanges. After nearly a decade of promoting these programs, though, the number of U.S.-Russian exchange students is still woefully shy of these targets.

In 1999, for example, there were only some 5,300 Russian exchange students (of all ages) enrolled in the United States, and fewer than 500 American exchange students (of all ages) enrolled in Russian schools and universities. Almost all of the American students and a large majority of the Russian students (85 percent or more) were over 19 years of age.

Clearly, the numbers here are far too small. Among the key obstacles to increasing the number of American students enrolled in Russian schools and universities is that not enough American students are sufficiently fluent in Russian, and that parents are rightfully concerned about their children's health and well-being while in Russia. As a result, there are likely to be more American undergraduate and graduate students interested and equipped to visit Russia than there will be high school students. If the number of American and European student visits to Russia were higher, the number of Russian visits to Europe and the United States would increase as a matter of course.

The question is how to make this happen. The study's participants had several ideas:

- Expanding current European Union and U.S.-funded student exchange programs to support Russian exchanges with the United States, European Union nations, and Australia. The idea here would be to encourage Russian exchanges with the United States and nations friendly to the United States rather than the United States alone.
- Creating a joint U.S.-European Union-Russian commission that would work to identify and eliminate as many of the current obstacles as possible to increasing Russian, European, and U.S. student exchanges.
- Treating American high school, undergraduate, and graduate exchange students as a single category so as to increase the numbers from which Russian high school exchange students might be paired.

- Creating more mentoring and internship programs for Russian exchange students visiting Europe and the United States so that their academic work in their chosen careers would be complemented by exposure to the Western work ethic prevalent in the appropriate professions. Such programs, in turn, could be created for U.S. and European exchange students visiting Russia as well. Certainly, these and other ideas need to be examined on a priority basis.

Finally, to the extent possible, those cooperative nonproliferation programs that cannot be privatized should be paired with transparent cooperative defense conversion programs that can.

As already noted, Congress has increased its scrutiny over the defense conversion projects that the Nunn-Lugar program funds. As a result of this oversight, Congress has generated an impressive list of desirable attributes for these projects. Just a sampling drawn from the most prominent analyses demonstrates how detailed the list has become. These criteria include making sure that the projects:

- avoid enhancing Russian strategic weapons capabilities;
- avoid the reinvestment of project profits and startup capital in weapons institutes;
- offer work that draws Russian weapons workers as far away from the activities of their weapons or nuclear institutes as possible;
- operate with transparent management and accounting procedures;
- create jobs for weapon scientists rather than employment for others at the weapons sites (e.g., spending on day care centers at the weapons institutes);

- draw future generations away from work in the military complex;
- encourage private sector employment as much as possible over public sector employment;
- promote nonproliferation results, e.g., quantifiable weapons reductions, increased monitoring of adherence to existing nonproliferation agreements, reduction in the threat of strategic weapons capabilities leaking to others outside of Russia, reduction of the chances for terrorist seizures, etc.;
- are designed to eventually be sustainable without congressional funding; and,
- have clear objectives and deadlines for completion.

It would be desirable, of course, if all U.S.-Russian cooperative threat reduction efforts met all of these requirements. As a practical matter, however, it is unlikely that any project has or ever could. Still, failing to meet these criteria could defeat the purpose of the projects. Certainly, no one in Congress wants to fund defense conversion efforts that might help Russia to sustain its weapons capabilities. Nor should the United States and Russia cooperate on programs that can never get done or that produce negligible nonproliferation benefits.

These realizations rightly troubled several of this study's working group members who, after several weeks of additional consideration, hit upon the idea of pairing. They recognized that many of the Nunn-Lugar program projects could operate only if they receive congressional funding, while others could not be initiated without such money. They also recognized, however, that frequent U.S. and Russian government support and involvement in these projects reduce the likelihood that they will ever make it commercially on their own.

There are, of course, exceptions. One example of a defense conversion effort that became self-sustaining recently is a small software company that was set up in the early 1990s to capitalize on the mathematics expertise of seven scientists from the All-Russian Research Institute in Sarov. Since then, the firm has created permanent civilian employment for about 100 former weapon scientists. These scientists now make three times what they made in the weapons institutes.

As significant as this success might be, however, it has done nothing to support the other cooperative threat reduction efforts that cannot make money. Could such profitable endeavors that are capitalized with U.S. funding be paired with necessary but unprofitable cooperative threat projects? This was the question several working group members raised. What inspired their question was the Nonproliferation Trust's business concept whereby profits from one activity—the storage of spent reactor fuel—would go to support other cooperative threat reduction activities that are incapable of generating revenue. It was this proposal that also suggested this report's recommended approach to deploying RSVP—getting the Russians to be the purveyors of health monitoring to other nations and using the monies raised to help maintain RSVP within Russia.

Members of this study's working groups learned from inquiries in the fall of 2001 that although such pairing has not yet been used in U.S.-Russian cooperative threat reduction efforts, it was attractive to U.S. officials on at least three counts:

- First, it could help defray the costs to the United States taxpayer of supporting cooperative threat reduction efforts generally, i.e., help defederalize them;
- Second, it would give both Russian and American officials an even greater incentive to develop defense

conversion programs that could succeed commercially on their own;

- Third, it would give both Russian and American entrepreneurs a profit motive to ensure that their governments concluded (with a date certain) the unprofitable cooperative threat reduction programs that their business profits were being used to support.

The apparent advantages of this approach, of course, have to be tempered by reality: not all cooperative threat reduction programs will be profitable, nor will those that are be able to pay for all those that are not. That said, to the extent possible, this pairing approach should be tried and applied.