The Way Forward for US-Russian Nonproliferation Cooperation

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The US-Russian cooperative programs for nuclear nonproliferation, including the Department of Energy's Material Protection, Control, and Accounting (MPC&A) Program and the Cooperative Threat Reduction (CTR) Program managed by the Department of Defense (DOD), have made unprecedented efforts to enhance the security of a significant amount of fissile material in Russia. The programs now face the challenge of building the institutional cooperation and partnerships needed to protect this material on a long-term basis in an environment of political uncertainty. Criticism has been leveled at the programs from both the US and Russian sides, and some of the most direct criticism has come from within the Bush administration.(2) The administration's initial proposal to cut over $100 million from nonproliferation programs in 2002 resulted at least in part from a critical review of the programs overseen by the National Security Council.(3) While the bipartisan Russia Task Force of the Secretary of Energy Advisory Board(4) was much more supportive of the overall effort (and recommended increases in the programs' budgets), a report by the General Accounting Office offered a mixed assessment.(5) All these reports called for a thorough review of all the nonproliferation programs and for the development of a comprehensive strategy to coordinate them.

Supporters of cooperative programs responded quickly,(6) but many responses to the proposed changes have been political rather than analytical, concentrating on the budget debate rather than on a careful examination of program costs and benefits. Support for the previous administration's budget is typically equated with support for the programs' objectives, or of nonproliferation in general. But with a new President in the White House and a new Atomic Energy Minister in Russia—Alexander Rumyantsev, who comes to Minatom from the Kurchatov Institute, an independent laboratory with a good record of cooperation with international nonproliferation efforts(7)—this is an opportune time to rethink the cooperative programs. Recent announcements regarding budget cuts to the programs cause concern and endanger their success only if the cuts are done for political purposes, rather than as a result of a thoughtful study of benefits achieved and lessons learned. Moving forward will require thinking outside the budgetary box and promoting best practices across agencies and programs. The many programs that are working well should be expanded, while those less successful require rethinking, or restructuring.

Toward this goal, this paper offers assessments of the successes and shortcomings of cooperative programs for nonproliferation, considering not only qualitative metrics such as the amount of fissile material protected, but also qualitative achievements such as setting precedents for further cooperation and building institutional foundations for the sustainable security of Russia's vast supplies of nuclear material. While we begin by dividing programs into two categories—those working well, and those that need rethinking—it should be said at the outset that many programs that have achieved impressive results also have limitations or shortcomings that need to be addressed, while other programs that may have been less successful have had important positive results for the overall nonproliferation picture.

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Programs Working Well

Mayak Fissile Material Storage Facility

The construction of the Mayak Fissile Material Storage Facility (FMSF) has not proceeded smoothly and has not adequately addressed transparency issues, but on balance offers a strong positive example of cooperation. The facility is meant to provide centralized, safe, secure, and ecologically sound long-term storage for fissile material removed from Russian weapons. When completed, FMSF will provide secure storage for 50 metric tons (MT) of plutonium from approximately 6,250 dismantled weapons. The facility is scheduled to load its 25,000-container storage wing in 2002. The United States will seek funding for another storage wing if Russia declares additional amounts of excess weapons-origin plutonium.(8)

The Mayak FMSF has been criticized for its cost, which may ultimately reach $1.3 billion, because of last-minute design changes mandated by the Russian side, and for lack of access and transparency.(9) These concerns are valid, but they are balanced by the superior security the site will offer, on a technologically sustainable basis (assuming that Russia will fund the facility's estimated $10 million annual operating costs) for a very large quantity of high-grade material. Access and assurances will remain an issue, but as the facility will not undertake any research or production operations, the obstacles to resolution of these problems are political rather than technical or operational.

In managing the construction of the facility, the Defense Threat Reduction Agency (DTRA) has set two important principles that should be emulated as best practices. The first of these is material consolidation. Storing material at a central, highly secure location relieves a large number of Russian facilities from the continued expense and risk of protecting weapons-grade material. Second, the FMSF illustrates the advantages of constructing a dedicated facility from the ground up. Designed for high security from the outset, the Mayak facility offers far fewer operational, bureaucratic, and national security-related impediments to the primary goal of secure storage of excess material when compared to storage at weapons research or production sites. Additionally, construction of a new facility offers economic opportunities in a region of Russia where conversion of military industry and development of new civilian business have been sporadic at best. Concerns over cost and transparency notwithstanding, the Mayak FMSF offers much for other cooperative programs to emulate.

HEU Purchase Agreement

The HEU Purchase Agreement and its Transparency Implementation Program will remove 500 MT of highly enriched uranium (HEU) from dismantled Russian nuclear weapons and convert it to low-enriched uranium (LEU) for use in US commercial power reactors. As of May 2001, over 115 MT of HEU had been blended down for sale to the United States. The estimated total value of the agreement is $12 billion, to be paid to Tekhsnabeksport (Tenex), the Russian executive agent for the agreement, over 20 years to 2013.(10)

This program has experienced difficulties as well, particularly in its commercial implementation on the US side. Some Russian commentators contend that the prices paid for downblended uranium are far too low, though many of these critiques stem from an unrealistic analysis of the global uranium market.(11)

The success of the HEU deal as a commercial venture is questionable, but its success as a nonproliferation program is unmistakable. In addition to converting a quantity of HEU sufficient to make 25,000 nuclear weapons into low-enriched form, the agreement gives financial incentives to the Russian facilities, surrounding communities, and agencies involved. All of these parties thereby become stakeholders in the success of the project, promoting its implementation and expanding the constituency for nonproliferation cooperation. In addition, while the transparency measures for the HEU agreement have not been fully implemented, (12) the Blend Down Monitoring System (BDMS) installed at the Urals Electrochemical Combine (UEIP) in Novouralsk and operated by the US Permanent Presence Office has set important technical and operational precedents for continuous onsite monitoring. These precedents could become particularly important if an expanded HEU purchase program becomes part of the nonproliferation agenda. Unfortunately, because a posting to the Permanent Presence Office is not considered a desirable or career-building assignment for national laboratory staff, the difficult, path-breaking work accomplished there by US monitoring teams is not receiving the recognition it deserves.

Naval Fuel Program

Cooperative programs now improve the security of a significant amount of both fresh and spent fuel for Russia's nuclear navy. Tens of tons of submarine fuel have been consolidated

COUNTRIES
China
Iran
North Korea
Russia

at Northern and Pacific fleet sites, and security systems have been installed. The Spent Naval Fuel (SNF) Disposition program removes irradiated HEU fuel from ballistic missile submarines (SSBNs) dismantled through the CTR program to reprocess or place into interim dry storage. The program designs, tests, and certifies transport containers and designs and constructs interim dry storage facilities. Spent fuel from up to 15 SSBNs has been reprocessed at the RT-1 complex at Mayak, under security upgraded through cooperation with the MPC&A program. Spent fuel from 14 SSBNs is in dry storage.(13) The success of naval fuel programs prompted the Russian Navy to request cooperation for the security of its stored nuclear weapons, and as of 2001, installation of security systems was underway at 41 of 42 naval weapons storage sites containing a total of 260 MT of nuclear material.(14)

The naval programs stand out among the Department of Energy (DOE) cooperative programs for their unique organization on the US side and a high level of official cooperation on the Russian side—particularly remarkable given the high sensitivity of nuclear weapons storage. After an initial period of confidence-building, Russian naval officers in charge of naval fuel supplies exercised their authority to direct fuel and weapons storage sites to extend a high level of cooperation to DOE teams. Because navy sites typically have less operational autonomy (and possibly less interference from Russian internal security services) than Minatom facilities, local misgivings over cooperation were overcome relatively easily once sites began working with US teams. At the same time, US personnel were given long-term assignments to naval programs, rather than rotated annually as is the case with most MPC&A program site teams. This enabled US technical experts and managers to build long-term working relationships with their Russian counterparts, yielding impressive improvements in the security of sensitive high-grade material. The principle of material consolidation was also applied to good effect, though here again the ability and willingness of naval officers to overcome (or overrule) individual sites' reluctance to give up control over material may have been decisive.

Strategic Offensive Arms Elimination

As of February 2001, the CTR program has deactivated 5,336 Russian nuclear warheads slated for dismantlement under arms control agreements. By 2007, a total of 9,881 warheads out of a CTR baseline of 13,300 are scheduled for deactivation, and the DTRA expects that target to be met.(15) These numbers were not attained without difficulty, and agreement on goals and timetables was one of many issues that were resolved through arduous but ultimately fruitful negotiations.(16) Russian demands for replacement of the social infrastructure (including housing) lost when missile bases were closed created an especially contentious issue, but the United States refused to amend the Nunn-Lugar legislation to allow DOD funds to be spent on social programs. Dismantlement of weapons nevertheless went forward, though Russian commentators (including the chief of staff of Russia's Strategic Rocket Forces) continue to call for the programs to take social needs into account.(17)

The best practice established by these DOD programs was the assignment of responsibility for implementing the programs to a new agency (DTRA) with effective leadership, sufficient institutional autonomy, a mission reasonably congruent with that of its parent department, and an organizational culture built around arms control and nonproliferation. Policy guidance is provided by DOD's CTR Office, which remains in the Pentagon. Clearly, the new administration should apply these lessons to the staffing and development of the National Nuclear Security Agency (NNSA), which is charged with implementing cooperative programs for DOE.

Education and Training Programs

The national education and training programs developed for material security specialists, including the master's degree program in MPC&A at the Moscow Engineering Physics Institute (MEPhI) and the Russian Methodological and Training Center (RMTC) at the Institute for Physics and Power Engineering (IPPE) in Obninsk, effectively combine education on proliferation threats and nonproliferation objectives with training on MC&A and physical protection procedures. Most personnel trained at these programs return to their facilities with significantly greater professional skills and greater awareness of their responsibilities as nuclear material custodians. Additionally, the national programs enable enhanced contacts with European, American, Japanese, and Korean counterparts through international conferences and joint training programs. These programs are essential for building Russia's sustainable capacity to protect its nuclear material.(18) These programs were developed within the framework of Russia's educational system and provide a basis for expanding nonproliferation education through regional training centers, an objective worth pursuing despite the delays experienced in establishing the Urals Methodological and Training Center and an MPC&A graduate program at Tomsk Polytechnic University.(19)

Export Control Assistance

The US Commerce Department and the Center for Export Controls, a Russian non-governmental organization (NGO) established with US government and private support, provide on-site training on Russian export control legislation, the objectives and procedures for export control systems, and industry compliance with export control regulations.(20) Some alternative employment is also created for former weapons scientists, who now train others in export control techniques. This assistance contributes to the creation of a nonproliferation culture, educating Russian industry as well as redirecting scientists from the weapons field. The focus on indigenous development of export control training programs is a best practice of this program worthy of emulation by both government agencies and NGOs.

Material Consolidation

Material consolidation is a rarely noticed but extremely important component of the cooperative nonproliferation effort. Through the pilot Material Conversion and Consolidation (MCC) Program initiated in 1999, HEU from NPO Luch in Podolsk and the Scientific Research Institute for Instruments in Lytkarino was blended down at Luch into 17.5 to 19% enriched LEU and transferred to more secure storage. DOE and Minatom subsequently agreed to expand the program to blend down and consolidate 24 tons of weapons-useable HEU by 2002.(21)

The MCC program has had its share of difficulties in implementation, not the least of which is the reluctance of many sites with small amounts of HEU to transfer their material to secure, consolidated storage. This reluctance is understandable, as in most cases giving up the material would require cessation of scientifically interesting and financially lucrative research and related activities. However, the right combination of incentives (including but not limited to financial ones) could persuade many smaller sites, particularly those outside Russia, with small amounts of high-enriched material to transfer this material to more secure facilities.

International Science and Technology Center

The International Science and Technology Center (ISTC) in Moscow has funded 1,250 projects through March 2001, involving over 30,000 Russian and other former Soviet experts working in military-related research facilities.(22) This program establishes scientific cooperation rather than commercialization, providing individual scientists and technicians with non-weapons work rather than converting entire facilities. ISTC's success stems from promoting reciprocal collaboration whereby Russian experts work as peers and colleagues with international partners on projects of mutual scientific interest. Critics have charged that ISTC-supported scientists could still participate in weapons-related projects, but ISTC officials contend that few scientists return to weapons projects after participating in ISTC-funded civilian research.(23) ISTC also offers a successful example of multinational cooperation for nonproliferation, with the United States, the European Union, Norway, Japan, and Korea contributing to fund projects in Russia and other former Soviet states.

Initiatives for Proliferation Prevention

The Initiatives for Proliferation Prevention (IPP) Program was established to prevent "brain drain" and gainfully employ former weapons scientists in the development and production of commercially viable civilian technologies. IPP matches scientific and technical talent in Russia with potential industrial partners in the United States. through the US Industry Coalition (USIC). IPP now has over 120 projects underway, including 40 in the closed cities of Sarov, Snezhinsk, and Zheleznogorsk. These projects include geophysical diagnostic imaging for oil recovery, gamma-ray spectrometers for the IAEA, prosthetic limbs, and numerical simulators for the petroleum industry. So far, seven projects have been completely commercialized, creating 260 new jobs and $9.4 million in sales. Twenty-five more projects will be commercialized next year.(24)

A major contributor to the success of the program is its "matchmaking, mediating, and mentoring" management approach. A "Site Advocate" for each project monitors progress and maintains contact with Russian participants. The advocates are personnel at US national laboratories who provide technical guidance and project oversight. The advocates have helped develop close working relationships between scientists in the two countries.

At the 2000 annual meeting of the USIC, industry representatives outlined some of the challenges they face in Russia. The greatest obstacles include large percentages of funds going towards overhead and taxes in Russia, Russian concern over high turnover in DOE personnel, and questions about the level of US interest in IPP.(25) These concerns, however, have been raised regarding almost all the US-Russian cooperative programs and reflect the problems of forging working relationships between US and Russian government and semi-governmental agencies as well as the overarching difficulties involved in doing business in contemporary Russia. Additionally, US industry participants must have their own resources to invest well above DOE funds, a high level of personal commitment and oversight, and stamina

for dealing with government bureaucracy and travel. Patent rights are another major concern of industry partners, and currently there are no DOE funds for Russian organizations to file for patents. Balanced against these drawbacks are the leverage gained from using DOE funds and the low-cost work by capable Russian scientists and technicians.(26) DOE and USIC are continuing their work to streamline the bureaucratic process, and new leadership in Minatom may enable faster progress.

Programs to Rethink

Material Protection, Control & Accounting

Before discussing why the MPC&A program needs rethinking, it is important to note the program's many achievements. The security of about 32% of Russia's estimated 603 MT of weapons-useable nuclear material has been upgraded. While commendable progress has been achieved at some sites (such as NPO Luch and IPPE in Obninsk), projects at other sites (including VNIITF in Snezhinsk) are at or near a standstill. Many areas of concern, particularly regarding physical inventory capabilities and guard forces, still remain. Access issues in particular continue to hamper progress at many sites. The US requires access and/or assurances to confirm that material is being protected, and access issues continue to delay projects and undermine confidence.(27) These obstacles have affected the program throughout its history and continue to impede progress. Cold War attitudes are persistent on both sides, and the high proportion of funds spent in the US also raises concerns.

Sustainability is another essential part of any successful MPC&A program that has not been adequately addressed. The capability to continually upgrade safeguards equipment is an important concern. Many sites now lack both human and financial resources to maintain high-tech equipment. At some sites, key personnel neglect essential procedures, such as the two-person rule, and equipment is not operated at all times. (At some sites, for example, portal monitoring equipment is operated only during working hours.(28)) The capacity to manufacture and maintain equipment must be built in Russia, and the legal and regulatory framework for materials protection in Russia also requires further development.

In order to improve the effectiveness of this program, the United States and Russia must agree on access and assurances as soon as possible. Program objectives should be prioritized through joint US-Russian strategic planning. Agreements are needed on key issues such as access and assurances, taxation, material consolidation, technology, and funding responsibilities. Institutional ties between DOE, Minatom, and Gosatomnadzor (GAN) need further development, fostered through both formal discussions on key issues and informal professional contacts through organizations such as the Institute for Nuclear Materials Management (INMM).

As with all collaborative projects, US site teams, Russian staff, and managers on both sides must cultivate cooperative relationships. The most important thing the United States could do in this regard is to give all US personnel long-term assignments to site teams, emulating one of the best practices of the navy programs. On the Russian side, leadership makes a critical difference, and facilities departments, and agencies that actively promote cooperation should be rewarded with demonstration projects, increased international contacts, and other incentives, rather than penalized for the actions of less cooperative organizations. Russian leadership is also vital for creating a supportive environment for personnel in Russia, which is a significant concern of Russian participants.(29) Working relationships based on mutual trust and respect must be strengthened by reducing personnel turnover on US teams, increasing communications between US and Russian experts at all levels, and using publications, professional meetings, and the Internet to share information and promote transparency.(30)

Plutonium Disposition

The US and Russia have both agreed to the disposition of 34 MT of excess weapons-useable plutonium.(31) However, they disagree on the economic value and environmental risks of this material; the United States essentially treats plutonium as waste to be immobilized, while Russia considers it a valuable resource to be exploited by fabrication of mixed-oxide fuel (MOX). Any option for disposition of plutonium (both weapons-origin and civil) has associated risks and technical difficulties that extend beyond the scope of this paper.(32) Any mode for disposition of Russian plutonium especially MOX production, will require international financing, which gives the United States a great deal of leverage over the mode ultimately adopted.(33)

Plutonium disposition is a complex problem, and neither side should be judged too harshly for being slow to implement a cooperative solution. The net cost per MT of material protected should also be considered when comparing disposition with MOX as disposition options, and

it is not clear that adequate cost-benefit analysis has been performed. In any case, the United States and Russia must recognize that the various objectives of plutonium disposition programs—nonproliferation, environmental, economic, and political—necessarily involve tradeoffs, and must be prioritized in order to make real progress.

Reactor Core Conversion

Initial plans to convert Russia's plutonium production reactors at Seversk and Zheleznogorsk to enable them to operate without producing weapons-grade plutonium, agreed to in 1994 with much fanfare by the Gore-Chernomyrdin Commission, have proven technically infeasible.(34) This outcome is fortuitous, because the operating safety of the aging production reactors was a serious concern (GAN insisted, with little effect, that they be shut down)(35) and had the reactors been converted and allowed to continue operation, a Chernobyl-scale accident at a US-financed reactor would have been frighteningly possible. The well-intentioned Reduced Enrichment Research and Test Reactor (RERTR) program was likewise unable to overcome technical and bureaucratic obstacles to reactor core conversion.(36)

The time has come for the parties to write off their losses on this program, shut down the production reactors, and seek international financing for new fossil-fuel-fired plants to replace the energy currently produced by the reactors (which are currently the only sources of electric power for their surrounding communities). The main lesson learned from both the core conversion and RERTR programs is that successful cooperative projects must be technically feasible, financially affordable, and politically acceptable; a project possessing only two (or one) of these virtues will almost certainly fail.

Defense Conversion and Commercialization

Conversion of military industry to civilian production is very difficult even under ideal circumstances, and circumstances in Russia are hardly ideal. It should come as no surprise that the achievements of a variety of programs designed to convert and commercialize Russian defense industry and weapons-related research have ranged from disappointing to dismal. The CTR Program's Defense Enterprise Fund, an initiative to channel private investment into defense conversion, spent about $70 million with few positive results.(37) The conversion programs initiated as part of the Nuclear Cities Initiative (NCI), intended to direct scientific and manufacturing talent in the closed cities of Sarov, Snezhinsk, and Zheleznogorsk into non-weapons-related channels, have produced some positive results, including a range of new commercial products ranging from perforators for oil drilling rigs to prosthetic limbs. Nevertheless, the NCI program has clearly not lived up to high expectations on both sides.

The drawbacks and limited results of conversion programs have resulted in particularly strong criticism, and proposed budget cuts, from the new US administration.(38) The inability to measure the success of conversion programs continues to breed suspicion about their usefulness, and Russian frustration and disappointment with NCI is particularly acute. One Russian observer concluded that NCI and other commercialization programs have provided jobs "only for a limited number of redundant personnel"(39) while another paints a bleak picture of corruption, mismanagement, and "welfare checks for weaponeers."(40) Other Russian critiques of conversion programs cite the lack of US attention to the social needs of the scientists and contend the programs should not deal with only technical issues, but must also raise the quality of life of the scientists.(41)

The reasons why commercialization has been so disappointing are not hard to fathom. In Russia as anywhere else, private investment, and particularly foreign direct investment, requires a business-friendly environment, but the environment in Russia's closed nuclear cities remains hostile to foreign investors. Russia's closed cities remain closed to foreigners (45 days' advance notice and a background check by the security services is required for any visit, and long-term residence for foreigners is essentially impossible), and their locations are remote from both international airports and domestic markets.(42) These conditions, of course, vary from city to city. Sarov, not terribly far from Moscow and benefiting from a civic leadership most favorably disposed to international contacts, has fewer disadvantages than the other closed areas. Overall, however, the intentional isolation of Russia's nuclear cities, and the palpable fear of both loss of military secrets and an increase in crime and other negative social trends if the fences come down, create barriers to commercialization that cooperative programs have not, and probably cannot, overcome.

However, this is not to say that the NCI has not done any good, or that properly structured cooperative programs could not improve economic conditions in the closed cities. Public investment should concentrate on public goods, including transportation, communication, health care, and education, that simultaneously facilitate economic development and improve citizens' quality of life. Encouraging successes in developing Russian high-tech industry, particularly in the software, aircraft manufacturing, and biotechnology sectors, outside the closed cities show that profitable utilization of Russia's scientific talent requires access to

world markets. With this in mind, access to the nuclear cities themselves can be improved while maintaining the security of military-related facilities. Visitors sponsored by local businesses and community organizations could be given long-term entry and residence permits similar to multiple-entry visas. The fences should stay up if citizens want them, but it should be made easier for commercial products and foreign visitors to pass through their gates. Educational programs such as the International Development Centers, established through the Foundation for Russian-American Economic Cooperation (FRAEC), should continue to provide training in business development, management, and marketing.(43) Given the potential economic, scientific, and political benefits of cooperative programs in the closed cities, the new administration's approach to NCI should be "mend it, don't end it."

Observations and Recommendations

> As Tolstoy wrote in *Anna Karenina*, "Happy families are all alike, but every unhappy family is unhappy in its own way." Although each program has its own set of strong points and shortcomings, it is possible to make some general observations on the factors that have promoted success and to offer recommendations on best practices across the spectrum of cooperative activities.

When the United States and Russia agree on specific objectives, programs work reasonably well. Strategic offensive arms elimination offers the best example of this principle. Once both sides agreed to goals and timetables, and reached an understanding on what US funds would and would not pay for, the program consistently reached its milestones.

Without agreement on objectives, programs work less well or create additional problems. There are many bad examples to choose from, but plutonium disposition, where the sides have divergent views of the value and risks associated with the material to be protected, may be the worst.

Working relationships between US and Russian nuclear custodians must be developed and maintained. These relationships take time to build, and must not be broken off just when they are beginning to bear fruit—but in many cases, this is exactly what has happened, as US personnel are rotated off MPC&A site teams after only one year of experience working with a specific facility. The navy programs offer the best example of how to build and maintain working partnerships, strengthened by consistent personnel assignment on the US side and leadership on the Russian side that has clearly "bought in" to the benefits of expanded cooperation while taking care to safeguard national security information.

Education and infrastructure programs are the least controversial and have the greatest long-term benefits. The national training programs (at MEPhI and RMTC) build Russia's sustainable capacity to protect nuclear material regardless of future changes in funding or political developments. These programs should be replicated at the regional level, and NCI and other conversion programs should place more emphasis on education, in both cases working with the strong educational systems in place in many of the closed cities. Improving market access through upgraded transportation and communication (including Internet and broadband connectivity) may not immediately provide jobs for weapons scientists, but will promote the closed cities' long-term economic prospects, offering a sustainable solution to the "brain drain" problem.

Both sides should shift emphasis from short-term problem-solving to long-term partnership. Because nuclear material security will continue to be a problem in Russia as long as the material exists, programs that centralize material for secure long-term storage, such as the Mayak FMSF and Material Conversion and Consolidation, will produce the greatest overall benefit. Cooperative ties between nuclear material custodians should be promoted at every level, from ministerial-level joint strategic planning to professional contacts between scientists, engineers, and technicians.

It is even more important that the two countries recognize material security as a permanent mutual interest that should be pursued regardless of temporary changes in the political wind. MPC&A and CTR cooperation should not be linked to progress on arms control, national missile defense, or other contentious political issues. In many cases, this will require executive branch leadership to resist legislative calls for budget cuts, restrictions on travel or other sanctions designed to show disapproval of actions which have little or no connection to material security. Entities that transfer nuclear technology with direct military applications to potential proliferators can and should be sanctioned, but the administration should not cut back nonproliferation cooperation simply because Russian companies refuse to halt conventional arms sales to third countries with which the US has less than friendly relations. (44)

The United States should promote best practices by expanding successful programs. Expanding naval programs, dismantling nuclear powered general-purpose submarines, negotiating an expanded HEU purchase agreement, establishing regional nonproliferation

education and training centers, and/or buying up HEU from the non-Russian NIS for consolidated storage in Russia would demonstrate how emulation of best practices can enhance the effectiveness of cooperative programs. Moreover, all of these expanded programs could yield political and economic benefits beyond the promotion of nonproliferation objectives.

Both sides must promote sustainability. The need to build a culture of sustainable cooperation in both countries can be met through a two-track approach. First, the US and Russian organizations involved should be given a clear institutional stake in cooperation. The organizational goals, financial and budgetary incentives, and career paths of US and Russian personnel should reflect the value both countries place on nonproliferation. Participation in the monitoring program at UEIP, for example, should be regarded as a mission-enhancing assignment for the individuals and organizations involved, and the same should apply to other transparency projects.

Second, institutional capacity should be built in both the US and Russia. The critical importance of leadership should be recognized, and programs should be directed by career managers and political appointees committed to the nonproliferation mission, not just to expanding budgets. In Russia, the legal and regulatory basis for participation in cooperative programs must be strengthened and streamlined to apply incentives consistently. Russia's regional communications, transportation, and financial infrastructure should also be strengthened, but these tasks should not necessarily be assigned to DOE and DOD. Finally, the need for expanded education and training, including policy as well as technical aspects of nonproliferation, cannot be overemphasized.

Nonproliferation Partnership from Rhetoric to Reality

To sum up, Russia and the United States talk the talk of partnership for nonproliferation, but they do not walk the walk. Partnership is based on agreement on common goals; while each partner possesses a unique set of interests and capabilities, and may disagree on specific approaches, they ultimately do different things in pursuit of a shared objective. The current state of US-Russian nonproliferation cooperation is precisely the reverse: the two parties do the same things in pursuit of different objectives. While they carry out cooperative programs with the ostensible goal of nonproliferation, many of the organizations involved view these programs primarily as means toward national security, maintenance or expansion of departmental budgets, or corporate and individual profit. These are more or less laudable goals, all of which attend the pursuit of any national policy, and none of which necessarily conflict with nonproliferation. Nevertheless, until key organizations in both the United States and Russia place a higher priority on nonproliferation in and of itself, continued friction between the parties and frustration with cooperative programs is inevitable.

To build a real partnership, both governments must make nonproliferation the highest priority of the key organizations responsible for nuclear material security. In the United States, NNSA has been given this mission, but does not yet possess the institutional autonomy and organizational culture it needs to carry it out. DTRA has the required organizational strength and culture, but has many other priorities apart from nuclear nonproliferation, and as strategic offensive arms elimination programs reach their objectives, the resources devoted to that part of DTRA's mission will necessarily diminish. In Russia, while many organizations and facilities take nonproliferation very seriously, no department within Minatom possesses sufficient commitment to nonproliferation for its own sake, and as a result, nonproliferation objectives are often given lower priority in an environment of continued political and budgetary uncertainty.(45) Meanwhile, both the US Congress and the Russian State Duma will make efforts to link nonproliferation to other aspects of US-Russian relations, and to parochial priorities. Only strong and patient executive leadership can resist this tendency.

The way forward is clear. Implementing the lessons the United States and Russia have both learned through cooperative security programs will require effective leadership. Selecting both political appointees and career managers with demonstrated commitment to nonproliferation, and assigning them the resources and authority they need to carry out cooperative programs, even when they conflict with other priorities, are the first steps the presidents of both countries must take to build a real partnership for nonproliferation and nuclear security.

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