

WORKING P A P E R S

ENHANCING NUCLEAR SECURITY IN THE COUNTER- TERRORISM STRUGGLE

**India and
Pakistan as
a New Region
for Cooperation**

*Rose Gottemoeller with
Rebecca Longworth*

**Non-Proliferation
Project**

**GLOBAL POLICY
PROGRAM**

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THIS PAPER REPORTS THE RESULTS OF A STUDY of the potential to apply the principles and practice of threat reduction cooperation to countries beyond the territory of the former Soviet Union.¹ The study, which was funded by the MacArthur Foundation, focused on the application of concepts and tools used in the former Soviet Union to the region of South Asia. The research was designed to explore what might be done cooperatively to enhance the security of the nuclear assets of India and Pakistan, lest they fall into the hands of terrorists or leaders of rogue states who would use them to threaten other states or peoples.

One might argue, however, that any country should become accustomed to viewing the responsible protection and control of weapons of mass destruction (WMD) as a matter in which the whole international community has a supreme interest. In this era of terrorists threatening to use WMD against civilized societies, all countries with WMD assets should be willing to take the responsibility to ensure that they do not fall into the wrong hands. Moreover, they should be willing to join in international partnerships to seek better ways to protect and control the assets. In this context, the results of the study may also serve as a guide and template for extending cooperation on nuclear security to other countries and regions of the world where the danger of WMD proliferation is strong.²

This project focused on enhancing the physical protection of nuclear and radiological materials and, where they exist, nuclear weapons. This paper will therefore not discuss biological and chemical agents that might be used in WMD programs. However, many of the issues to consider and the suggestions for cooperation discussed here might be applied in chemical and biological settings.

The study was carried out through a series of in-depth interviews and consultations. They involved experts both in and out of the U.S. government on the various existing U.S. cooperative programs as well as on regional security, especially experts on South Asia. Interviews and consultations were also conducted with selected foreign interlocutors, including several government representatives from Russia, China, and Kazakhstan. The International Atomic Energy Agency (IAEA) was also engaged directly, through a seminar conducted at its Vienna headquarters and through interviews with responsible IAEA managers and experts.

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- 1 In this paper, the term *threat reduction cooperation* refers to all programs of the U.S. government in the former Soviet Union devoted to reducing the threat of weapons of mass destruction and furthering nonproliferation goals, whether they are located in the Department of Defense, Department of Energy, Department of State, or elsewhere.
 - 2 Senator Richard Lugar (R-Ind.) has suggested that threat reduction cooperation be extended to any country of the world in which protecting and controlling weapons of mass destruction is an issue. See his press release on “The Lugar Doctrine,” December 6, 2001; see <http://www.senate.gov/~lugar>. More recently, Senator Lugar and Senator Sam Nunn (D-GA) have proposed a “Global Coalition Against Catastrophic Terrorism.” See Lugar’s speech on the topic on the Lugar site, May 27, 2002.

Those interviewed for the study commented not only on the utility and substance of possible joint cooperation but also on how the other countries, in the first instance India and Pakistan, might be engaged. In other words, the engagement strategy for cooperation was an important aspect of this study.

The study participants also commented on who might be involved in joint cooperation. From the outset, the study examined a series of basic questions: Should any new cooperation to enhance nuclear security primarily be a U.S.-led enterprise or should other international partners be involved? In particular, should the Russian Federation, Kazakhstan, and the other countries that have thus far been the focus of such programs join in efforts to extend them to South Asia? Should other countries that have been working on threat reduction projects, such as the European countries and Japan, be involved? Should additional countries with long-standing ties to the region, for example, China, be engaged? And how should multilateral organizations such as the IAEA be involved? This study examined the wide variety of international partners who might join in such efforts.

BACKGROUND

Threat reduction cooperation with Russia and the other newly independent states of the former Soviet Union is nearly ten years old and has matured immeasurably in that time. In recent years, the goals of the cooperation as it relates to protection and control of nuclear assets have been highlighted by efforts such as the Baker-Cutler Task Force on Department of Energy nonproliferation programs.³ In that and other efforts, a consensus has emerged about the necessity of accelerating work in the former Soviet Union to lessen the threat that WMD, including nuclear weapons and materials, would fall into the wrong hands.

The goals cited generally focus in the following areas: (1) accelerating protection, control, and accounting of weapons-usable nuclear materials; (2) accelerating the disposition of those materials; and (3) addressing brain drain from the former Soviet weapons complex to countries and entities of concern. For the last goal, we now have the opportunity to move beyond the original brain drain concept of keeping scientists at work in their weapons facilities, to an emphasis on moving scientists out of those facilities and accelerating the shutdown of those facilities or their restructuring away from weapons work. This modified brain drain goal can serve wider U.S. strategic interests, particularly shrinking Russian warhead production potential.

The maturity of the existing programs can be seen in the range of facilities, especially highly sensitive ones, where they operate in Russia and the other newly independent states. It can also be seen in the variety of procedures that has been developed to implement and even, in latter years, to accelerate the programs. Finally, it can be seen in the solidity of the working relationships that have developed among the program managers from both the United States and the states involved.

Now the question arises, is the maturity of the cooperation such that it can be extended to solving other policy problems confronting the international community? After all, the circumstances surrounding the breakup of the Soviet Union in 1991 were unique. One of two major nuclear superpowers was coming apart at the seams, with no clear view at the time as to what would replace it:

3 "A Report Card on the Department of Energy's Nonproliferation Programs with Russia," Howard Baker and Lloyd Cutler, Co-Chairs, Russia Task Force, January 10, 2001, The Secretary of Energy Advisory Board, United States Department of Energy.

a red-brown Communist-Fascist alliance deeply at odds with the United States? a rapid dissolution of the Soviet Union's republics into warlord-run particle states? a total breakdown of law and order? In December 1991, anything seemed possible in a country deploying 12,000 strategic nuclear warheads and owning tens of thousands more, along with almost 2,000 tons of weapons-usable nuclear material.

It was in these unprecedented circumstances that Senators Nunn and Lugar engineered the original legislation to establish the Nunn-Lugar Cooperative Threat Reduction (CTR) program in 1992. With no other regions presenting this combination of crisis and dissolution, however, the extension of similar cooperative techniques to other settings seemed problematic. Would any other country, absent an urgent crisis, want another country deeply involved in its nuclear weapons complex? Indeed would Russia and the other former Soviet states, as their circumstances improved, want to continue the threat reduction relationship?

In the immediate aftermath of the September 11 tragedy, answers to these questions began to emerge. First, it seemed increasingly likely that at least one other region of the world, South Asia, would face a crisis that might ease the acquisition of WMD among terrorists or rogues. Second, the keen and public interest of Osama Bin Laden in acquiring nuclear and biological weapons by any means enhanced the necessity of speeding threat reduction work on his doorstep in the countries of the former Soviet Union.

In short, it became possible that countries such as Pakistan or India would become interested in cooperation to enhance the security of their nuclear assets, and it became likely that Russia and its neighbors would want to redouble their cooperative efforts with the United States. This likelihood became policy reality when Russian President Vladimir Putin decided to join U.S. President George W. Bush in the counter-terrorism struggle, and the two counted nonproliferation of WMD among their top priorities. Now we seemingly need only to implement this policy.

Thus, there are two directions to consider in looking at new opportunities for the program: First, what immediate use can the experience of the past decade be in other regions of the world, for example, in South Asia? Second, what new priorities should be pursued with the original program partners, Russia and the newly independent states? Understanding that it may be difficult immediately to generate new appropriations for a South Asia program, this study assumes that an expansion of cooperation to the region to enhance nuclear security is nevertheless possible in this season of crisis. It also assumes that expanding into new priorities in Russia and the newly independent states is not only possible but also desirable in the current circumstances. However, given the emphasis of this study on South Asia, the question of new priorities for Russia and the newly independent states is not discussed further in this paper.

NONPROLIFERATION TREATY AND REGIME

Many questions arise concerning threat reduction cooperation with India and Pakistan, but some of the most important are associated with the Nonproliferation Treaty (NPT) regime. Because neither India nor Pakistan is a member of the regime, political barriers exist in their own systems to undertaking such cooperation. For the United States and other members of the regime, the nonmembership of India and Pakistan creates serious complications in both law and policy.

The NPT itself is the most important legal document relevant to this issue. Article I states that nuclear weapons states will not encourage or assist nonweapons states in the manufacture or acquisition of nuclear weaponry. The development of a joint effort to enhance security for military nuclear materials may lead India and Pakistan to believe that they are being encouraged to continue their weapons programs. In a worst case, U.S participation in a threat reduction program might be seen as the moral top cover for a major nuclear buildup in South Asia. In that circumstance, certain nonnuclear weapons states under the NPT might be encouraged to start up their own nuclear weapons programs, thereby threatening the survival of the treaty.

Article III of the NPT addresses the issue of safeguards and presents yet another challenge for the initiation of a program with India and Pakistan. Because both countries have several unsafeguarded civil nuclear power facilities, no technologies or fuel that would make those facilities more efficient can be transferred. Paragraph 2 of Article III states:

Each State Party to the Treaty undertakes not to provide: (a) source or special fissionable material, and (b) equipment or material especially designed or prepared for the processing, use or production of special fissionable material, to any non-nuclear-weapon State for peaceful purposes, unless the source or special fissionable material shall be subject to the safeguards required by the article.

Building fences around facilities and otherwise enhancing their physical security may not fall subject to such constraints. However, such projects are likely to be subject to legal and policy determinations that will delay and complicate their implementation. In some cases, congressional action may be necessary. For example, current U.S. legislation prevents all technical interactions between the United States and India on nuclear energy, except those related to nuclear safety.

In addition to the NPT, India and Pakistan are not members of the Nuclear Suppliers Group, which outlines five conditions for supplying nuclear materials to countries in the process of developing nuclear export control programs:

1. Countries developing nuclear export control programs should adopt the Zangger Committee's definitional criteria and trigger list as they apply to nuclear technology and hardware.
2. Certain materials not defined in the IAEA statute as "special fissionable materials," such as heavy water and the means of producing it, should also trigger safeguards.
3. Restraint is recommended for the export of sensitive technology and materials, such as those usable for enrichment, reprocessing, and heavy water production (applies to nonnuclear states party to the NPT, that is, those going beyond the extent of the Zangger Committee).
4. Recipients' assurances of nonexplosive use should be required prior to export.
5. Suppliers' governments have to be satisfied with the arrangements for the physical protection of nuclear materials and facilities against unauthorized use before they would issue an export license.

There may be aspects of each of these regime measures that India and Pakistan would be willing to adopt as their own policy. It may be possible, therefore, to encourage these countries to develop new cooperation with the regime and at the same time establish joint projects to enhance physical protection of nuclear materials. Certainly any steps that are taken to cooperate on nuclear material protection should not weaken regime measures. Indeed, the emphasis should be on enhancing the nonproliferation regime in the course of material protection efforts.

In the end, the United States and the international community might have to create a “space” in the legal and policy environment in which cooperation to enhance the physical protection of nuclear materials can occur. Although it would be premature to speculate on what the boundaries of such a space might be, it should clearly take account of the constraints of the NPT as well as internationally accepted standards for export control laws and procedures. A key goal must be to continue to strengthen the nonproliferation regime.

Although issues related to the NPT regime are clearly of great importance, they will not be developed further in this study. The relationship between the NPT regime and new efforts to develop cooperation on the physical protection of nuclear materials deserves additional analysis, but it is beyond the scope of this research. We turn now to considering the concrete and practical steps that may be required to engage the interests of countries in nuclear security cooperation.

VENUES FOR COOPERATION

This background discussion has provided a sense of the opportunities and issues that emerge when one considers the future of nuclear security cooperation. On the opportunity side of the ledger, the study highlights a wide range of venues for the cooperation. Up to this point, the great majority of threat reduction projects conducted in the former Soviet Union has been on a *bilateral government-to-government* basis, with the United States usually leading on the donor side. Exceptions have been the several projects in which Japan or individual European countries (Norway, Germany, the United Kingdom) have had the donor lead.

In other cases, *groups of countries or international consortia* have served as the organizing mechanism. The International Science and Technology Center (ISTC), for example, has long been a major organizing body for brain drain projects in Russia. In latter years, the European Union (EU) has also begun to apply more resources to cooperation in this arena. Whether on a bilateral or multilateral basis, however, the government-to-government quality of cooperation has been dominant.

Other venues for cooperation have also been used, however, and in many cases might be preferable to government-to-government efforts. For example, there is a wide variety of *nongovernmental organizations* that could provide launch points for nuclear security cooperation in other countries and regions. Some have well-established second-track activities that might be used to introduce the concepts of such cooperation to a new audience. Others, such as the Nuclear Threat Initiative, may have sufficient funds available to take on some experimental or pilot project activities. These in turn could serve as an *entrée*, perhaps, to further government-to-government interactions.

An interesting nongovernmental approach might be one involving *commercial entities or associations*. For example, the World Association of Nuclear Operators (WANO) for many years has had a successful peer review system in place. These peer reviews focus on nuclear safety issues and make use of international expert teams drawn from companies operating commercial nuclear power reactors. Nuclear utilities apply to join WANO and, in that context, elect to have a peer review, which provides them with suggestions to improve their safety performance and bring their reactors up to world standards. The Indian and Pakistani nuclear utilities are already members of WANO and are undergoing peer review.

A *laboratory-to-laboratory program* occupies ground between the governmental and nongovernmental approaches. This approach, which involved the nuclear complex laboratories, was successfully used for several years in the early days of the effort with Russia, when the United States and Russia were feeling their way as to what was possible in the sensitive arena of nuclear threat reduction cooperation. This type of program has the advantage of building confidence quickly between the two sides, as the scientists find a common language and agenda, but it may be difficult to implement in cases where the two communities are widely separated and have not had cause to interact in the past. The United States and Soviet Union had long interacted in the nuclear arms control arena and therefore had considerable joint experience of communication and cooperation before the Soviet breakup occurred.

Without this same history of cooperation, it may be necessary for the United States to find alternatives to the classic laboratory-to-laboratory approach. One alternative, for example, might be to ask Russian or Chinese scientists with long-standing ties in these countries to serve a “door-opening” function for the United States. Another might be to use an existing mechanism, the U.S. sister laboratory program, to engage the interests of these countries. Although not a classic laboratory-to-laboratory approach in the U.S.-Russian sense, this concept provides an established template for engaging new foreign partners. This option will be discussed further below.

Finally, a *multilateral organization* approach might have considerable benefits in particular contexts. For example, the IAEA is the international organization that verifies compliance with states’ peaceful use undertakings under the NPT. It welcomes members from throughout the world, whether or not they are signatories of the NPT, if they have an interest in safe and secure uses for peaceful nuclear technology. Pakistan, in this way, has been working with the IAEA on nuclear power plant safety issues. Because the IAEA works with many countries, it may in some cases serve as a more acceptable umbrella for nuclear security cooperation than a country such as the United States, the single remaining superpower and nuclear weapons state under the NPT. It should be noted, however, that the IAEA does not engage in projects involving weapons facilities or assets.

INTERNATIONAL PARTNERSHIPS

Beyond the international consortia and multilateral groups of countries that have already been mentioned, there are unusual partnerships that have not been tried before but which might be especially effective in new regions. For example, the United States and Russia have long worked together on threat reduction projects in the Russian Federation and have an enormous amount of joint experience that may be applied in other settings. The same is true of other countries among the newly independent states, especially Kazakhstan and Ukraine, which also have the distinction of being countries that denuclearized following the dissolution of the Soviet Union. Both countries have become nonnuclear weapons states under the NPT and are responsible players in the international nonproliferation policy arena.

In addition, China may be an important player, although it has not had a long-term experience of working cooperatively with the United States or any other country on nuclear security projects. China has been involved in some early demonstrations of material protection, control, and accounting technologies with the United States, and it is a nuclear weapons state under the NPT. It has also played the major role as nuclear supplier to certain countries, particularly Pakistan. Because

of these long-standing relationships, China could be vital to the success of threat reduction cooperation in regions such as South Asia. Indeed, in South Asia, the relationships of Russia to India and China to Pakistan in the nuclear power arena may enable earlier entrée by the international community for threat reduction purposes than might otherwise have been possible.

Long-standing relationships in the nuclear power industry are not the only source for possible international partnerships, however. Other partnerships may be established based on particular functional interests or areas of expertise that a country develops. For example, following a 2000 incident at a nuclear power plant in Japan, the Japanese government has spent a great deal of time and attention on improving its response capabilities to nuclear accidents. This emphasis on emergency response and incident mitigation may be a particularly important area for new threat reduction cooperation. A country such as Ukraine, with its experience of responding to Chernobyl, may also have an important, indeed compelling, contribution to make in this area.

Juxtaposing Japan and Ukraine brings up an important issue with regard to international partnerships: resources. In the cooperative projects to this point, the United States, along with a few other countries such as Japan, has made considerable investments of funds from its national budget. The recipient countries—Russia, Ukraine, Kazakhstan—have contributed in-kind resources, such as labor, but have not had to call on their national budgets for large sums of money. As new international arrangements are considered for carrying nuclear security cooperation into other regions, these funding issues should be carefully considered. Will the United States continue to be the primary source of funds for such projects? Will other countries in Europe, Asia, and elsewhere in the world participate with funding? Can Russia and the other newly independent states find ways to make contributions? These alone are important matters, but one major question dwarfs them all: Will efforts to fund projects in other regions compete with still-urgent work to be done in the former Soviet Union?

If this question proves to be serious, then the international community might wish to consider a division of labor in which the United States, Russia, and the other newly independent states continue to place a priority on work in the former Soviet nuclear arsenal. Other international actors could then take on the establishment of new nuclear security cooperation in other regions of the world. One example of such a division might involve the IAEA. Clearly, the United States and Russia would want to remain involved, and their contributions to IAEA work would be vital. However, the agency could take the lead in developing new projects in South Asia.

Another more controversial approach would be to involve international groupings, such as the Shanghai Cooperation Organization, that do not include the United States in their number but have declared nonproliferation to be a policy priority. This approach would “free up” the United States to continue concentrating on the former Soviet arsenal. It would also have the advantage of engaging a community of states that has never faced the necessity of stepping up to challenging threat reduction and nonproliferation projects. It would, however, have the enormous disadvantage of distancing the United States—the most experienced donor country for such work and one of the most committed international leaders in nonproliferation policy—from this new sphere of cooperation.

Probably a more useful model is that which the EU has pursued thus far. The EU is developing its own priorities for nonproliferation cooperation in the former Soviet Union, but it is doing so in coordination with the United States. The EU and the United States, along with non-EU European countries and Russia, have met repeatedly to ensure that their agendas and budgets are coordinated. This division of labor, though still in an early stage, may eventually work well.

Another important question that will have to be confronted is the level of nonproliferation commitment among the various partners. Russia and China, for example, have long been sources of concern to the United States as suppliers of nuclear weapons, missile, and dual-use technologies to countries of proliferation concern—including Pakistan and India. If the international community decides that the threat of terrorism involving WMD is serious enough to warrant a “crisis response,” then getting beyond past proliferation behaviors and problems will perhaps be justified. However, it will be important that international partners add value to cooperative projects and not exacerbate proliferation threats.

Among those in the U.S. government community who were interviewed for this project, this point elicited the greatest range of opinion. Some believed that partnering with Russia or China in South Asia would prove too risky and leave the United States with inadequate control over projects. Others believed, by contrast, that such partnering might provide a useful environment for developing a new, more positive relationship with these countries on nonproliferation policy and might even contribute to addressing some of the older proliferation issues.

POINTS OF ENTRY

Having considered *who* might participate in enhancing nuclear security in South Asia and other new regions of the world, it is also important to consider *how*. Countries such as Pakistan or India are unlikely to embrace such cooperation easily. It did not come easily to the former Soviet states, despite the uncertainty and air of crisis that surrounded the dissolution of the Soviet Union. It took nearly five years after the Nunn-Lugar program was launched in 1992 to gain momentum in important parts of the agenda, especially material protection, control, and accounting inside the nuclear weapons complex. Patience was required.

With this in mind, there are already indications that those responsible for managing the nuclear complexes in South Asia are concerned with the level of international discourse on the security of nuclear weapons and materials in their respective countries. As the South Asia area specialists interviewed for this project cautioned, this underscores the need to proceed with caution and patience when developing an approach to initiating cooperative programs in that region.

Beginning with projects that engage the interests of such countries early will therefore be important. The countries that enter the cooperation will have to be convinced that the projects are in their national interests, with some combination of economic, political, and security interests engaged. The nuclear assets of India and Pakistan are such a source of national pride and so highly secret that the leaders of those countries will have to sell both their elites and their publics on the importance of the cooperation.

That is why the tactics of entry into the cooperation must be carefully considered. First, the diplomacy of engaging with India and Pakistan will have to be crafted to appeal to national interests. Important players in New Delhi or Islamabad will have to be able to point to the cooperation as benefiting key economic, political, or security interests. Second, the public presentation of the cooperation will have to be coordinated in all the countries that are involved in it. If, for example, the media in the United States were making elaborate claims about U.S. reach into sensitive Indian or Pakistani facilities, that message would be picked up by media in the subcontinent, and the effect on the continuation of cooperation could be devastating.

If such cooperation is extended beyond India and Pakistan to other regions of the world, the question of points of entry might be easier to handle. If countries are not harboring a nuclear weapons program, then the appeal of international cooperation in this arena is likely to be more readily evident to their publics. International cooperation to improve the physical protection of civilian nuclear facilities is easy to understand and embrace, especially if international funds are provided for that purpose.

Common Responsibility and Commitment

The most important foundation stone for any effort to establish cooperation will be a sense of common responsibility and commitment among those at the negotiating table. They will have to share the resolve to prevent nuclear weapons and materials and other WMD from falling into the hands of those who would use them to attack countries around the world. A continuing sense that “we are all in this together” in the struggle against terrorism will be vital. It will also be important for countries to be committed to undertaking the political, legal, and structural changes that will be needed to establish, implement, and sustain the cooperation.

Assuming that this foundation is being developed, the United States can build the negotiations around points of entry that seem to best support the interests of the players in the region. This study has assumed throughout that India and Pakistan would be engaged simultaneously in the discussions, although probably on parallel tracks. The list of entry points below also assumes that the cooperation is being pursued on an urgent basis but not in the teeth of a major national crisis such as a regime change that would bring extremist elements to power in either country.

Overarching Strategy for Cooperation

Although this study focused on the narrow topic of enhancing the physical protection of nuclear and radiological materials, this pragmatic program will be implemented best if it is integrated with the existing strategy for U.S. cooperation with these countries. This overarching strategy should embrace the full universe of core issues, whether economic, political, military, social, or humanitarian, with the objective of creating a workable framework under which to engage with these countries on a broad front. To address the root cause of proliferation problems, we may need to include wider inducements—not only military but also economic, humanitarian, and education incentives.

A broader assistance strategy would open avenues for engagement in South Asia, which in turn would build the relationships needed to implement a wide-ranging, long-term program to enhance the physical protection of nuclear materials. This effort will take time, however, so it is worth encouraging early, practical steps to cooperate on material protection while building an overarching strategy for cooperation.

With these comments in mind, the following *points of entry* suggest how India and Pakistan might be successfully engaged to consider joining in new cooperation to enhance the security of their nuclear facilities. The points are not arranged in any priority order. Further analysis and dialogue with regional experts—and perhaps exploratory conversations with the countries themselves—would be needed to decide which projects would best appeal to national interests in the region as well as to elite and public opinion.

1. *Projects of general, worldwide interest in the counter-terrorism struggle.* Protection of critical infrastructures has come to the fore in many countries as their leaders grapple with how to address the threat of terrorist attack. Considering civilian nuclear power facilities within the country's energy infrastructure and military nuclear facilities within its overall defense infrastructure may be a way to set the problem of nuclear protection and control into a broader context. Participation of nonweapon states that have large industrial infrastructures, such as Japan and Germany, may be appealing in this context.
2. *Projects of specific interest to the relevant sectors of the national economy.* The civilian nuclear power industry in each country, for example, is likely to have a specific interest in cooperation on nuclear reactor safety and emergency response and mitigation. If being on the receiving end of a project is too sensitive even where there are specific interests at play, then the first stages of the cooperation could be couched as an exchange of information, where each side learns from the other. If necessary, such an exchange could be conducted initially as a track-two activity led by nongovernmental actors.
3. *Projects that draw on the indigenous capabilities of national industry.* Cooperative projects could, wherever possible, use local companies to manufacture the components needed to carry them out. Using local parts and equipment would have the advantage of quickly engaging the interests of the local business community, which is likely to be an important confidence builder for the larger national elite. Moreover, there is an advantage for project sustainability if parts and equipment are available locally for maintenance and further equipping of sites.
4. *Projects based on best practices.* To develop the notion of an information exchange, cooperation with India and Pakistan may begin through an exchange of information on best practices in specific areas (for example, reactor safety training, export control, emergency management and response). The information-sharing activities could be conducted on nonsensitive issues but would provide a forum for the United States to develop the relationships and trust needed to work on more sensitive issues. Nongovernmental organizations might also take the lead in the early stages of such an exchange.
5. *Projects with major appeal to particular political players.* Certain cooperative projects, such as situation and crisis centers (24-7 watch centers) and emergency communication networks, are high-visibility efforts that signify a certain level of sophistication for a program. For that reason, such projects tend to bolster the political position of those who establish them in addition to enhancing the crisis response capability of the organization where they are established. They can also be constructed quickly, using off-the-shelf, nonsensitive technology.
6. *Projects based on multilateral umbrella organizations and established programs.* As mentioned above, the IAEA is already working with Pakistan on nuclear reactor safety issues, and Pakistan has asked the IAEA for assistance on developing systems for physical protection of civil facilities. In addition, the International Physical Protection Advisory Service (IPASS) of the IAEA provides missions to countries around the world to assess, in a nonconfrontational way, the physical protection provided at their nuclear facilities. Experts from the United States and other countries participate in these missions.

7. *Projects that take a regional focus.* Countries are sometimes attracted to projects if the entire region in which they are located is coming to the table to engage. Thus, the IAEA has had significant success with regional seminars on strengthening the state system of accounting and control for nuclear materials. A recent regional seminar for Central Asia and the Caucasus that also involved China and Russia was especially positive. Another method is to use regional training centers (for example, the Kuzmich Center in Ukraine) to provide courses taught by the IAEA on relevant topics such as nuclear accounting methods. These centers draw experts from throughout the region. WANO also provides training on a regional basis and emphasizes that developing an esprit de corps among regional experts is key to enhancing safety at nuclear power plants. Once they are comfortable with one another, experts are more likely to consult with their regional colleagues for advice on technical matters.
8. *Projects developed as pilot efforts, based on priorities expressed by the countries themselves.* Pakistan, for example, has apparently expressed interest in improving the physical security of fuel at its civilian nuclear reactor sites with international participation. Given the pedigrees of Pakistan's various reactors, the United States, Canada, and China might be among those who could usefully participate in such an effort. Other countries bordering on the region, such as Russia and Kazakhstan, might also have a particular role to play. (This possibility is discussed further below.)
9. *Projects developed from a menu of "what worked for us," but allowing other countries to pick and choose without reference to specific issues within their nuclear complexes.* This approach worked particularly well in the early stages of cooperation with the Russian Federation. The United States offered briefings on technologies that had improved safety and protection of U.S. nuclear weapons but made no suggestions about what might be especially relevant in the Russian case. The Russians were able to set their own priorities and return at a future time with proposals for cooperation, such as armored blankets and railcar upgrades.
10. *Laboratory-to-laboratory projects that take advantage of natural affinities between and among scientists.* As mentioned above, this model was used to great advantage in the early years of threat reduction cooperation with Russia, "jump-starting" a number of activities that later grew into major government-to-government programs, particularly in the realm of preventing brain drain. Because of the superpower relationship, however, certain ties had long been established, particularly in the arms control arena. It was generally agreed that a similar fast start with the Indian and Pakistani scientific establishments might be difficult to accomplish. Nonetheless, Russian experts who were consulted noted that Russia has several decades of experience and relationships within the Indian scientific community and may be able to assist by opening doors and providing introductions for the United States, with the objective of creating a classical laboratory-to-laboratory program. Another approach would be to build a sister laboratory program. A sister laboratory is an established way for the United States to develop a relationship with the civilian nuclear sector in a country. Projects in the sister laboratory could be conducted in nonsensitive areas, which might include radioactive waste management, medical isotope production, or physical protection of radiological threats. Laboratory-to-laboratory projects can be paired with other approaches, such as using local manufacturers to provide parts and equipment.

11. *Projects that take advantage of debt for nonproliferation swaps.* Use of debt swaps as a way to finance large new threat reduction projects in Russia is currently under consideration in the U.S. government and is receiving some favorable reviews. Given Pakistan's large external debt, this approach may have an appeal to the Islamabad government. Pakistan's economic problems, however, may make it difficult for the government to generate the amount of domestic capital that would be needed to pay for projects in the swap arrangement. The concept, therefore, would have to be carefully examined as to whether its utility might extend to South Asia. Most experts interviewed agreed that we should wait and see how this concept develops with respect to the Russian threat reduction cooperation before attempting to expand its mandate to address issues in South Asia.
12. *Projects that utilize "private sector" experience and lessons learned.* As mentioned above, WANO already has contacts with India and Pakistan and might be able to provide a useful entrée to new bilateral or multilateral contacts. Some experts cautioned, however, that such a role for an organization such as WANO might detract from its primary mission, which is providing peer review of civilian nuclear power programs around the world. Another "private sector" approach to consider might be engaging companies such as Bechtel and Lockheed-Martin that have had extensive experience in implementing threat reduction projects in the former Soviet Union to implement pilot or demonstration projects in new countries. In this case, they would provide a "leading edge" and confidence building for more extensive cooperation involving government players.
13. *Projects that are based on a "special bilateral relationship."* In certain cases, it may be that projects are too sensitive for multiple partners to be involved at once. In these sensitive cases, a government-to-government bilateral program could be developed to limit the exposure of sensitive information to a small number of participants. Such a bilateral "special relationship" was developed between Kazakhstan and the United States to manage the packaging and removal of highly enriched uranium from Ust-Kamenogorsk. An important question to consider is whether the United States would always wish to be one partner in such a "special relationship" or could agree to let another country take the lead, keeping the United States informed of progress. This approach can work, although it is complicated. In the case of Ust-Kamenogorsk, for example, the United States and Kazakhstan worked together but kept the Russian Federation informed of progress. Over a long period, this approach would require a great deal of confidence among the parties and would be unlikely to be tenable in cases where the United States was providing financing.
14. *Projects that employ a "broader menu of inducements."* As noted in the introduction, a broader range of economic, humanitarian, scientific, and educational inducements may be needed to initiate engagement in South Asia. Looking back to the early days of the CTR program with the former Soviet Union, the United States first committed a substantial amount of money to Kazakhstan for economic and technical aid, not nuclear issues. An educational aid program might be especially welcome in Pakistan, where science education is weak and individual scientists are keen to engage in science education programs. Again, this broader assistance agenda could lead the way to and lay the groundwork for more wide-ranging, long-term material security programs.

PRINCIPLES FOR A NEW STAGE OF COOPERATION ON ENHANCING NUCLEAR SECURITY

Here we consider more of the substance—that is, *what types* of projects the two countries might undertake, and with what set of international partners. Rather than simply listing a menu of new projects, however, the discussion tries to link new projects with the principles that should guide them and any new U.S. government efforts in the threat reduction arena. The principles are listed in numbered order below, followed by some examples of projects that would be relevant to them.

1. Consider what threats will be particularly attractive or accessible to terrorists and decide whether and in what way they should receive a higher priority.
2. Develop situation- and country-specific partnerships with other countries that will enable the cooperation to develop more quickly and efficiently.
3. Incorporate new and especially co-developed technologies and capabilities that enable new areas of cooperation or enhance the efficiency and sustainability of existing projects.
4. Undertake cooperation in a way that will strengthen and reinforce arms control and nonproliferation regimes.
5. Endeavor to transform adversaries in nonproliferation policy into nonproliferation partners.

PROJECTS TO FIT THE PRINCIPLES

The following are examples of projects that would fit these principles:

Projects should be set to match counter-terrorism priorities. Thus far in the U.S.-Russian cooperation, lower-level nuclear waste or radioactive source materials have not usually been covered in material protection, control, and accounting projects because of the much higher priority of protecting weapons-usable nuclear material. There is no question, however, that radiological or “dirty” bombs are an attractive weapon for terrorists and have been receiving much publicity as such. In this case, considering the continuing priority of protecting weapons material, along with the (in most cases) limited lethal effect of radiological weapons, perhaps it is most important to stress projects that would immediately address the particular problems that radiological weapons raise. These are primarily public panic and economic costs, including cleanup. Projects to address these problems would fall into the realm of emergency response and incident mitigation. They would have a technological component (for example, developing more cost-effective sensing and monitoring systems) and could certainly have an international component. The concept of international emergency response and incident mitigation teams could be built on existing cooperation with Russia, Japan, and the IAEA. Some countries, such as Japan, may be willing to contribute resources to such an effort. For example, a project in this area could focus on the sabotage threat to civilian spent nuclear fuel. Cooperation on these issues could provide an entrée for the international community to engage with India and Pakistan.

Projects should draw on international partnerships. The preceding example has already highlighted this principle, but it is worthwhile considering how an international partnership might work in

specific projects. Pakistan may be interested in assistance to improve the secure storage of its spent and fresh fuel at its civilian nuclear reactors. Kazakhstan, in cooperation with the United States, has just completed the repackaging and establishment of safeguarded storage for about three hundred tons of fresh and spent fuel remaining at the Aktau reactor on the Caspian Sea. Kazakhstan not only has the technical expertise to participate in such projects but also has some important in-country hardware assets, such as a factory capable of producing nuclear material storage containers for this type of work. Such regionally located assets may contribute considerably to lowering the costs of a project of this kind. Moreover, the presence of Kazakhstan on a team with the United States and Pakistan would be a powerful symbol. Kazakhstan is a country in the region that gave up the nuclear weapons left on its territory at the breakup of the Soviet Union and became a nonnuclear weapons state under the NPT. China may be another highly effective partner in cooperation with Pakistan, although the lack of an established threat reduction program with China would mean a longer developmental period for Chinese participation.

Projects should incorporate new cooperative technologies and capabilities for improved effectiveness in reducing threats. International cooperation on nuclear emergency response, while an attractive idea on the surface, would be difficult under current circumstances, whether conducted in Russia, South Asia, or elsewhere in the world. Because of the nature of the work—that is, finding nuclear weapons that have gone astray through accident or foul play—U.S. nuclear emergency response teams operate with the most sensitive information and equipment, and it is likely that their counterparts in other countries do as well. However, technological developments may facilitate cooperation in even this most sensitive of arenas. The advent of cooperatively developed information barrier technologies developed for the Mayak storage facility and related joint projects may enable future joint U.S.-Russian work in this sensitive area. Another possibility that is not so dependent on sensitive information or equipment would be to develop a cooperative training program based on the U.S. Radiological Assistance Program (RAP), which was developed as a result of the Three Mile Island accident. The RAP teams focus on radiological materials and conduct on-site, real-time detection, survey, modeling, and analysis activities using nonsensitive technologies. One possible project, therefore, would be to train those responsible in South Asia to be first responders in case of a radiological accident or loss of materials. Additional capabilities of this type in the international community might also benefit the United States. A future nuclear terrorism threat in a broad swath of this country may require more search assets than the United States could muster. It would be good for the United States, or any other country facing such a threat, to be able to call upon additional resources in this kind of emergency, in much the same way that foreign relief crews are brought to bear in large natural disasters such as earthquakes and forest fires.

Projects should reinforce international arms control and nonproliferation regimes. India and Pakistan are not signatories to the NPT, but they do participate in parts of the nonproliferation regime (for example, certain activities of the IAEA). Although these two countries may not wish to embrace an international team urged on them by the United States or Russian Federation, they may be willing to accept one under the aegis of the IAEA—with the very same international participants. The agency's International Physical Protection Advisory Service, as already mentioned, offers countries, even those not cooperating especially well in other nonproliferation efforts, the opportunity for consultations on improving the security of their civilian nuclear facilities. Use of this mechanism, in turn, reinforces the role of the IAEA and strengthens the overall nonproliferation regime.

An example of a project that could support this objective might be to develop a dialogue on export control systems. Both India and Pakistan have fairly good export control systems on paper, but very little is known about their implementation. The initiation of an exchange on best practices in export control might lead to an opportunity for these states to convey that their export control laws and practice correspond with the nonproliferation regime or parallel it. For example, it may be possible for these states to convey that they are in compliance with key tenets of the Nuclear Suppliers Group.

Adversaries in nonproliferation policy should be transformed into nonproliferation partners. India and Pakistan have for many years taken a combative stance with regard to the NPT, branding it a discriminatory document in international forums and resisting policies developed on its basis. In this context, the United States has often seen New Delhi or Islamabad as a kind of adversary in nonproliferation policy. In the crisis era that has emerged since September 11, when terrorists are threatening to use WMD against the United States and other countries around the world, every country has an interest in ensuring that such assets do not fall into terrorists' hands. This study has assumed that, despite past adversarial relations, it would be good to develop joint projects to reduce such threats in a cooperative manner. At a minimum, countries such as the United States, India, and Pakistan have each amassed individual experience over the years in protecting nuclear assets. Such experience can be shared in a way that could benefit others. Information sharing of this kind might be carried out on an ad hoc basis or under the aegis of an organization such as the IAEA, thus reinforcing the NPT regime. As noted above, the exchange of information on export control best practices is another example of cooperation that could have this effect. If the United States worked in parallel with India and Pakistan to share information on protection and control of nuclear assets, the United States would be taking the first step toward transforming these countries from adversaries into partners in the nonproliferation arena.

TOWARD A WIDER VISION OF COOPERATION: ISSUES TO CONSIDER

The interviews conducted in the course of this study have produced a wealth of insight about how best to begin working with India and Pakistan to enhance the security of nuclear materials. More broadly, the ideas developed here could be used to launch a new era of cooperation with countries around the world to reduce the threat of nuclear terrorism. At the same time, we must be cautious about losing our focus on the former Soviet Union, where the vast majority of nuclear materials and weapons still reside. Because of this competition between existing efforts and new cooperation, it will be vital to set priorities; resources will be limited, and many countries possess at least some nuclear or radiological assets. *But everyone interviewed for the study agreed that new international cooperation to enhance the protection of nuclear materials was a worthy effort to pursue.*

To conclude, the following list represents a synthesis of issues that project interlocutors believed would be important to discuss as we move forward in developing this cooperation. Not everyone agreed on their importance, so the list is in no particular order of priority. Each issue, however, deserves further consideration and discussion.

- The sense of crisis regarding the potential for WMD terrorism (that is, a sense of the urgency of the threat) may not be shared by all countries. Therefore, it will take time and effort to

develop commitment among countries to engage in this cooperation—commitment that will be vital to the success of the effort. Nuanced approaches, incentives, confidence building, and patience will all be needed.

- The cooperation may have to begin with civilian facilities and build up confidence slowly toward eventual joint work in military facilities. In that case, a staged approach might be a useful concept to consider. The IAEA, through its established relationships, may be a special and effective “accelerator” of cooperation at civilian facilities. Later, as confidence develops and cooperation moves to military facilities, the IAEA would not be involved. At that point, the cooperation may move to the stage of a “special bilateral relationship” for sensitive facilities.
- The idea of proceeding with civilian projects first and military later is defensible for a number of reasons, including the urgency of the terrorist radiological threat. However, this has not been the traditional priority in the cooperative threat reduction programs, where a special focus has been maintained on weapons-usable material, warheads, and strategic launch vehicles. Although a new era of cooperation need not slavishly maintain this traditional priority, a careful priority-setting effort must nevertheless be undertaken. Without it, focus on the urgent and critical work in Russia and the former Soviet Union might be lost.
- Approaches that involve multilateral, bilateral, nongovernmental, or commercial partnerships can work, but they will require a careful division of labor and coordination. This coordination, however, should be with a small “c” rather than a large “C”—pragmatic and informative, not constraining or overbearing. At least in its emerging form, the coordination relationship that is developing between the United States and the EU is a good example of pragmatic and informative coordination.
- Interest in this new era of cooperation is emerging at a time when the U.S. Department of Defense, the long-time implementing organization for cooperative threat reduction programs with the Russian Ministry of Defense, is deeply engaged in military operations to fight the war on terrorism. Few of the projects foreseen in the new international cooperation to enhance nuclear security would involve military contingencies. Therefore, it will be difficult for the new cooperation to attract attention and resources in the Department of the Defense; special leadership in the Defense Department will be required to do so.
- The new cooperation will be difficult to maintain in a pristine state, linked solely to a sense of mutual interests in and responsibility for a high standard of nuclear security. A state such as India, for example, is likely to seek resolution of its long-standing issues with the nonproliferation regime—perhaps to enable it to buy reactors for its civilian nuclear power program. Countries that might be partners in the new cooperation, such as Russia, would likely be interested in selling India some reactors. The United States, in such a case, would have to consider whether it would adjust its long-standing policies affecting civilian nuclear cooperation with India, and what it would require of India (and Russia) in return. In other words, the new cooperation will disturb the policy status quo in a complicated and not wholly predictable way. This issue is linked to the discussion at the outset of this paper of the need to sustain and strengthen the nonproliferation regime.

Each of these issues makes clear that a new era of international cooperation to enhance the security of nuclear assets will require some major rethinking of U.S. policy. In the case of India and

Pakistan, establishing such cooperation requires the United States to undertake demanding diplomatic efforts or adjust U.S. policies in ways that would take years under normal circumstances. We must thus ask ourselves: Will the crisis atmosphere that has surrounded the antiterrorism campaign remain in place long enough to effect these enormous, in some cases tectonic, policy changes? If not, then we perhaps would be better off to stick with the existing array of projects with Russia and the other former Soviet states, expanding their budgets and reach, sharpening their priorities, and eventually extending them into new regions or problem areas.

However, if the United States decides to tackle the WMD terrorism problem in a new way, then it is clear that the successes and failures of the past decade of cooperative threat reduction with the former Soviet states have created a wide experience base. This base is ripe for expansion to other countries such as India and Pakistan. If the United States, in cooperation with other countries such as the Russian Federation, is ready to take on this task, then the potential for nuclear security cooperation in the counter-terrorism struggle is serious and wide ranging. To accomplish this potential, however, will require U.S. leaders to exercise high-level attention, broad thinking, and willingness to take risks.

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