Controlling Weapons of Mass Destruction

Findings from USIP-Sponsored Projects

Edited by **Deepa M. Ollapally**

Peaceworks

United States Institute of Peace

Contents

Introduction

More than thirty years after the passage of the Nuclear Nonproliferation Treaty (NPT), the record is mixed on the effectiveness of the nonproliferation regime. The end of the Cold War gave rise to a flurry of nonproliferation and arms control initiatives in the 1990s, including the Chemical Weapons Convention of 1994, the indefinite and unconditional extension of the Nuclear Nonproliferation Treaty in 1995, the Comprehensive Test Ban Treaty of 1996, and the ongoing negotiations for the Fissile Material Cutoff Treaty. Along with the declared U.S.-Russian commitments to deep cuts in their nuclear arsenals, these moves may be seen as contributing to the creation of a less dangerous world.

At the same time, however, there are both persistent and new threats to peace, particularly the proliferation of weapons of mass destruction through covert and overt means in potentially serious theaters of regional conflict. There are also uncertainties regarding the possible proliferation repercussions of the national missile defense system under consideration in the United States, the U.S. failure to ratify the Comprehensive Test Ban Treaty (CTBT), and Russia's mixed signals on nuclear weapons under the leadership of Vladimir Putin.

The United States Institute of Peace has attempted to make a limited but important contribution to furthering the understanding of some of the most critical global and regional issues surrounding weapons of mass destruction and arms control, primarily through its grant program. Since its inception, the Institute has spent $2,190,372 on related topics, aimed at shaping intellectual debate and informing policymaking. This *Peaceworks* report highlights some of the recent key Institute-supported work in this connection, with a view to offering the most significant findings and policy-relevant conclusions.

The possible direct or indirect links between nuclear weapons and conflict, particularly as manifested by dangerous arms racing, unsustainable levels of militarization at the cost of social and economic development, nuclearization by unstable or failing states, illicit trafficking in nuclear technology and materials, and safety lapses in nuclear weapons control, all have to be taken seriously whether deterrence is believed to work or not. In addition, emerging challenges from chemical and biological weapons pose other dangers, particularly as they relate to terrorism.

The centerpiece of the nonproliferation regime, the NPT, continues to face a serious challenge in the wake of the 1998 nuclear tests by India and Pakistan. While the precise impact of India's and Pakistan's nuclear tests on the effectiveness of the NPT is open to interpretation since neither of the two countries is a signatory, the treaty's inability to respond to the new status of these countries in any meaningful way could call into question its relevance under changing conditions. Israel's undeclared nuclear status continues to pose a dilemma for the NPT as well. Critics of the NPT argue that the treaty not only is discriminatory but also has been overtaken by events. Its advocates counter that, although the NPT may be an imperfect instrument, it is the only instrument available.

by
Deepa M.
Ollapally

While this particular debate, which is at once legal and political, is not likely to be settled anytime soon, the thrust of U.S.-led global nonproliferation efforts has diversified in recent years beyond the NPT, ranging from the military sanctions response in the case of Iraq to the more economic incentive–based approach taken toward North Korea. There is also an array of informal and formal arrangements fashioned by the nuclear weapon states that seek to dampen proliferation through technology denial regimes and export controls such as the Missile Technology Control Regime and the Waassanaar Agreement, which superseded the Cold War–oriented Coordinating Committee for Multilateral Export Controls (COCOM). With the end of the Cold War, the main targets of these measures are the so-called states of concern (formerly dubbed "rogue states"). Despite these efforts, there is a lingering feeling that current regimes are not fully addressing some of the most critical issues such as the NPT holdouts, states of concern that are NPT signatories, and the double-edged sword of technology diffusion. The need for new thinking may be greater than ever.

In an effort to encourage innovative thinking, the United States Institute of Peace has supported projects that relate to the functional aspects of nonproliferation, as well as those that are more regionally focused. The eleven projects featured in this report have been partially or fully funded by the United States Institute of Peace, but by no means do they constitute the entirety of the Institute's activity in this area, which comprises eighty-two grants over the past fourteen years. (A list of Institute-funded projects on arms control and deterrence from 1986 through 2000 can be found online at www.usip.org/grants /Funded_Projects/FP-Arms_Control.html.) These eleven projects have been selected chiefly on the basis of their timeliness and/or salience to current concerns, with the intent of contributing to ongoing debates in the field. The selection has also sought to achieve a regional balance. In addition, because the projects showcased here are drawn from successful grant awards, the spectrum of topics covered is inevitably limited. For example, although the debate over the national missile defense system is on the rise at the moment, there is at present no grant project that looks directly at this issue and its implications for arms control. This is likely to change in the future, particularly as projects that focus on security in East Asia and Russia consider the impact of U.S. missile defenses. Generally, this publication has attempted to be as widely representative of the broader pool of grants as possible. It should also be recognized that the project summaries by the project directors in this *Peaceworks* report provide only a glimpse into the larger body of research being undertaken by them, much of which is likely to result in published articles and books or has already done so.

This report begins with a consideration of the varied approaches and tools that have been developed to meet the challenges posed by weapons of mass destruction. David Albright, president of the Institute for Science and International Security, and Kevin O'Neill, deputy director, take stock of the overall achievements of nonproliferation efforts and pronounce it a relative success story. They note that despite President John F. Kennedy's prediction that more than twenty countries would have the nuclear bomb by the 1970s, the reality is that only eight countries are currently known to possess nuclear weapons. Yet Albright and O'Neill caution against undue complacency, especially in the face of potential developments that could well throw off course, if not reverse, the apparent momen-

tum for arms reductions. As they see it, two critical problems are looming in the background: Russia's ongoing economic crisis and its implications for Russia's security stance, and the national missile defense system being pondered in the United States that could stimulate other countries to add to their arsenals or to develop countermeasures.

John Simpson, head of the Programme to Promote Nuclear Nonproliferation (PPNN) at the University of Southampton in the United Kingdom, concentrates on the NPT, viewed by many as the linchpin of nonproliferation efforts to date. Simpson highlights several key weaknesses of the NPT structure, which he sees as deriving mostly from the lack of any permanent institutions for monitoring and verification and for providing secretariat and information services to member-states. In place of such institutions, a conference of the parties meets every five years for assessment and review. Simpson describes how PPNN attempts to bridge this institutional gap through its publications and seminars. The author suggests that the work of the NPT Review Conference in May 2000, which held particular significance as the first Review Conference since the 1995 indefinite extension of the NPT, was especially aided by the preparatory work of PPNN.

Denial of technology to would-be proliferators is an approach that has been used extensively, but it poses a continuing dilemma for all sides given the "dual-use" (i.e., civilian and/or military) nature of advanced technologies. Richard Speier, formerly with the Office of the Under Secretary of Defense for Policy in the U.S. Defense Department, was directly involved in the various phases of the multilateral talks that led to the Missile Technology Control Regime (MTCR). He takes a close-up look at the negotiations behind the MTCR, an informal agreement among key suppliers of missile technology that appears increasingly to be taking on the force of a treaty. Speier first focuses on the struggles within the U.S. government to hammer out an acceptable position before getting others to sign on and then distills a set of lessons for the development of new regimes in the future.

On technology transfers, Jean Pascal Zanders of the Stockholm International Peace Research Institute (SIPRI) in Sweden extends the discussion to biological weapons of mass destruction, specifically the structure of the future protocol to the 1972 Biological and Toxin Weapons Convention. This protocol will have to strike a balance between ensuring that states are not impeded from access to important technologies, on the one hand, and creating effective safeguards against illicit transfers, on the other hand. Zanders describes the difficulty of maintaining this fine balance under the twin imperatives of globalization and the biotechnology revolution in the contemporary period and suggests how new mechanisms of control may be designed.

Jean Krasno and James S. Sutterlin of United Nations Studies at Yale, Yale University, provide an account of the United Nations' unprecedented foray into physically eliminating a member-state's capacity to produce weapons of mass destruction through the United Nations Special Commission (UNSCOM) in Iraq. The authors look carefully at UNSCOM's information gathering and intelligence functions, which came under increasing scrutiny over time. They evaluate UNSCOM's experience and consider its utility as a new model for future nonproliferation action. They conclude that while UNSCOM was largely successful in achieving its objectives, it is highly doubtful that the constellation of forces that allowed UNSCOM to be created will be replicated anytime soon.

While weapons of mass destruction are a cause for concern in any context, their actual or potential presence in regions that are already plagued by volatility, undemocratic governance, and extremist tendencies creates a sense of added urgency. The second part of this *Peaceworks* report presents research and analysis conducted by grantees with regional expertise, who at times offer findings that do not necessarily accord with conventional wisdom.

The question of strategic stability in a nuclearized South Asia is closely analyzed by Shaun Gregory of the University of Bradford in the United Kingdom, with particular attention given to the question of whether a sufficiently robust command and control system that meets the requirements of stable deterrence can be put into place in India and Pakistan. Gregory finds that the simplicity of the two countries' nuclear posture greatly reduces the demands on their command and control arrangements. For example, without the need for NATO-style complex targeting and precise escalation control inherent in a flexible response approach, India and Pakistan can fashion a limited system within their means. Nevertheless, Gregory puts forth a number of propositions from his research that suggest that neither Delhi nor Islamabad should be especially sanguine or relaxed about their respective nuclear arsenals.

The possibility of nuclear weapons in the Persian Gulf region continues to create a good deal of anxiety, and Geoffrey Kemp, director of the Regional Strategic Program at the Nixon Center, constructs several scenarios for the future of Iran's nuclear weapons capability, with an eye toward how the regional and international environments might interplay with Iranian domestic politics in determining the direction of policy. Kemp points out that Iran's regional threat perceptions, particularly its fears about U.S., Israeli, and Iraqi military potential, which are critical in driving its nuclear policy, are likely to continue no matter who is in power in Tehran. One of Kemp's main conclusions is that a political rapprochement between the United States and Iran is likely to provide the "breathing space" for any regime in Iran to seriously reconsider the benefits of exercising a nuclear option.

Russia has been a key conduit of nuclear and missile technology to the developing world, including regions of instability, and the issue of Russia's evolving export policies on sensitive technologies is taken up by Vladimir A. Orlov, founder and director of the Moscow-based Center for Policy Studies in Russia (PIR Center). Orlov assesses Russia's declaratory export policies against actual practice, with the aim of finding ways to narrow the gaps that exist. A major obstacle, Orlov believes, is that in the transition from a command economy to a competitive market system, Russia is viewing the defense technology export market as one of its few comparative economic advantages. He suggests that weak enforcement of the law, shortages of technical equipment, and a lack of a nonproliferation culture at most enterprises together work against the effectiveness of export restrictions that do exist. In addition, Orlov notes that at the broader level one of the most difficult problems to tackle is the brain drain from Russia.

As a member of the nuclear club, China has tended to send mixed signals about its participation in regional and global nuclear arms control, as exemplified by its ambivalent behavior during the CTBT negotiations. Alastair Iain Johnston, professor of government at Harvard University, explains China's shift from resistance to ultimate acceptance of the

CTBT by applying a sociological approach rather than the conventional realist model. Johnston portrays Chinese strategies vis-à-vis the CTBT as being consistent with China's sensitivity to social pressures affecting issues of reputation, status, honor, and prestige; had China been driven purely by strategic arguments, it would not have accepted the CTBT, which is likely to freeze Chinese warhead modernization at a stage that could impinge on its future refinement. Socialization into the international community then may be seen as having greater import than believed, even when ostensibly vital security interests are at stake.

One critical but uncertain challenge that tends to concern the public and policymakers alike is the possibility of weapons of mass destruction (WMD) falling into the hands of terrorists. A less public but no less acute problem relates to the security and control of the stockpile and flow of weapons-grade fissile material in the aftermath of the collapse of the Soviet Union. The third part of this *Peaceworks* report considers the prospects of these emerging but ambiguous threats.

Gary Bertsch and Igor Khripunov at the University of Georgia paint a grim picture of current Russian safeguards of surplus nuclear material, noting that in the past the system had relied heavily on "guards, gates, and guns," as well as on the high prestige accorded to workers, in order to ensure that material was not illegally diverted. The economic upheavals beginning in the 1990s, together with the shrinking of the country's social safety net, have created an entirely different environment, one marked by low morale and social unrest at nuclear facilities. Bertsch and Khripunov trace the path stolen material might take in Russia, from nuclear complexes to customs services and overseas, and find little room for confidence in the ability of legal and physical safeguards to halt the theft of nuclear material. The authors argue that the challenge of controlling Russia's surplus fissile material should be a global concern and call for greater foreign assistance, especially from the United States, in meeting that challenge.

Jessica Eve Stern's research on terrorism and weapons of mass destruction suggests that the debate on this issue needs to move away from the two extreme ends of the spectrum: the optimism that terrorists will never use such weapons and the pessimism that large-scale attacks are inevitable. Stern, based at Harvard University, considers several criteria that groups that are candidates for using unconventional weapons must possess and finds that the motivational, organizational, and technical constraints against the use of WMD are eroding. Yet WMD attacks have been rare, and Stern offers a number of possible explanations. She concludes that terrorists are most likely to rely on low-tech operations and assassinations rather than on the catastrophic attacks that we worry most about.

This overview is only indicative of the broad backing that the United States Institute of Peace has provided to scholars and policy analysts across the world who grapple with the seemingly intractable but vital problem of weapons of mass destruction. The Institute believes that a realistic and dispassionate understanding of the issue, which tends to stoke deep fears and passions, is a prerequisite for developing effective policies and countermeasures. Despite the enormity of the challenge, it seems imperative that such responses be both consistent with changing realities and acceptable to the larger international community. The primary objective of this *Peaceworks* is to report on some of the ways in which the Institute is playing a part in shaping the outcomes of this debate.

Part I: Approaches to Nonproliferation

One

Striving for Nuclear Nonproliferation

David Albright is the president of the Institute for Science and International Security (ISIS), and Kevin O'Neill is the deputy director of ISIS. Located in Washington, D.C., ISIS is a nonpartisan, nonprofit organization that provides technical, scientific, and policy analysis related to national and international security. The project funded by the United States Institute of Peace seeks to identify and evaluate previously successful nonproliferation strategies and to suggest new approaches to prevent proliferation and reduce the threat of nuclear-armed groups. The project engages an international group of scientists and policy specialists in order to draw from a variety of sources. Albright and O'Neill's discussion here provides an overview of the problem of nonproliferation and sets the stage for the more focused chapters that follow.

The Relative Success of Nonproliferation Initiatives

by
David Albright
and
Kevin O'Neill

Since the beginning of the nuclear age, more than twenty-five countries have had nuclear weapons programs, but only about nine or ten countries ever obtained nuclear weapons through an indigenous program. Another three states inherited nuclear weapons following the breakup of the Soviet Union, but all of these countries gave up these weapons and joined the Nuclear Nonproliferation Treaty (NPT) as nonnuclear weapon states. Another five or so countries may have had plans of obtaining nuclear weapons.

Currently, eight countries are known to have nuclear weapons—Britain, China, France, India, Israel, Pakistan, Russia, and the United States. South Africa dismantled its nuclear arsenal during the early 1990s in what remains a unique step. Despite having signed the NPT, North Korea may have one or two nuclear weapons. Iran and Iraq are suspected of seeking the wherewithal to build nuclear weapons, even though they are signatories to the NPT. A few other countries, such as Algeria, Libya, South Korea, and Taiwan, are not viewed as having active nuclear weapons programs, but their domestic or regional security circumstances raise concerns about whether they will seek nuclear weapons in the future.

The present situation is alarming, although the number of countries that have obtained nuclear weapons is far smaller than originally expected. During the early 1960s, for example, President John F. Kennedy said that more than twenty nations might have the bomb by the 1970s.

Why were the numbers so much smaller than expected? Part of the answer lies in the fact that countries have experienced unexpected technical difficulties in creating the industrial infrastructure to make nuclear weapons. The most important reason,however, why so few countries have obtained nuclear weapons is the continuing development of national and international efforts to stop the spread of nuclear weapons and to achieve nuclear disarmament. These efforts have increased the political and economic costs of proliferation and made countries think twice about seeking nuclear weapons. Thus,many countries that started nuclear weapons programs have subsequently abandoned them.

Nonproliferation initiatives include the NPT, the International Atomic Energy Agency (IAEA) and its recent strengthening of its international inspection, or "safeguards," system, the Nuclear Suppliers Group (NSG), bilateral and multilateral arms control agreements,diplomatic efforts to reduce regional rivalries,national regulations, bilateral discussions, and government policies. Collectively, these efforts are often called the international nonproliferation regime.

Persisting Gaps and Pitfalls

Success should not obscure how tough the fight has been or how many problems remain. In fact, nuclear proliferation continues to present one of the most significant threats to international peace. Complacency about the spread of nuclear weapons must be avoided. Several developments bode ill for the nuclear nonproliferation regime.

Iraq remains an acute proliferation risk. Its success in concealing important parts of its nuclear weapons and other weapons-of-mass-destruction programs from UN Security Council–mandated inspections has worn down international support for intrusive inspections in Iraq. In essence,statements by inspectors about the "lack of evidence of banned Iraqi programs" are increasingly being misunderstood as "evidence of no banned activities."

In December 1999 the UN Security Council adopted (in Resolution 1284) a new inspection plan for Iraq that would return inspectors to Iraq after more than a year's absence. However, concerns exist that political support for these inspections is lacking in key countries,particularly France and Russia, that wish to end economic sanctions against Iraq and renew lucrative commercial contracts with Iraq as quickly as possible. Iraq has not allowed inspectors to return to Iraq under the December 1999 resolution, and thus the chances are growing that it will secretly reconstitute its nuclear weapons program, something that Iraq has the knowledge, expertise, and determination to do quickly. Moreover, there is also the concern that Iran has intensified its nuclear weapons efforts in response. The result could be a dangerous nuclear arms race that could seriously threaten U.S. policies in the Persian Gulf region and the rest of the Middle East.

Although the U.S.–North Korean Agreed Framework "froze" North Korea's nuclear weapons program, it has been difficult to implement the other conditions in the agreement, in particular the providing of North Korea with two light-water reactors that would substitute for its frozen reactors. Progress on the agreement continues to require high-level political intervention, but erratic attention by the Clinton administration, persistent criticism by some members of Congress, and North Korean provocations seriously delayed

the implementation of the agreement and periodically cast doubt on its future. The newly installed Bush administration has yet to tip its hand on how it will address the situation.

Israel, Pakistan, and India remain outside the NPT framework; thus there are currently few prospects to reduce their nuclear arsenals, let alone eliminate them. The nuclear tests by India and Pakistan in May 1998 vividly demonstrated that not everyone is interested in taking part in the existing nonproliferation regime. Other countries, including members of the NPT, may even decide to follow the examples of India and Pakistan. Moreover, the "on-again, off-again" military clashes between India and Pakistan over the status of the Kashmir region show that the possession of nuclear weapons does not prevent conventional conflict. Indeed, these clashes have the potential to escalate into a full-scale war, in which one or both sides may decide to use nuclear weapons.

More recently, the October 1999 rejection by the U.S. Senate of the Comprehensive Test Ban Treaty (CTBT) undermines a key objective of the NPT's enhanced review process, namely, the implementation of the CTBT. The CTBT's defeat dramatically alters the nonproliferation landscape, particularly by calling into question the NPT's central bargain, whereby the nuclear weapon states agree to reduce their reliance on nuclear weapons for their security. Some experts and close U.S. allies have already suggested that confidence in the NPT regime has been shaken by the Senate's vote. Some of these officials worry that the price for withdrawing from the treaty is declining, which may encourage one or more states to leave the treaty because they envision few serious consequences.

Other recent developments have also undermined nuclear nonproliferation efforts. India, Iran, North Korea, and Pakistan have pursued medium- and long-range missile programs in tandem with their nuclear weapons programs. In the wake of NATO's military victory in Yugoslavia in early 1999, some foreign leaders remarked that the only way to deter U.S. conventional forces is by acquiring nuclear weapons or other weapons of mass destruction.

Counterstrategies by Potential Proliferators

Strategies used by those who seek nuclear weapons are also evolving, and would-be proliferators have learned to respond creatively to efforts to halt proliferation. With the disintegration of the Soviet Union, the possibility of a frightening shortcut to nuclear weapons has become all too real. States or terrorist groups could try to obtain poorly protected Russian nuclear weapons, stocks of plutonium, or highly enriched uranium.

Countries continue to seek ways of evading export controls. Some countries devote great effort to searching for weak links in the international control regime. For example, an Iraqi document from 1986 advertised a lecture sponsored by the Iraqi Atomic Energy Commission at Al Tuwaitha Nuclear Research Center on "deceptive technological policies" to further illicit procurement efforts carried out overseas. Although export controls cannot prevent proliferation, they buy time for other remedies to work. Export controls remain effective only if they are constantly improved. Otherwise, they will, in fact, become weaker.

Russia's ongoing economic crisis has worsened fears that its weak enforcement of export controls on sensitive nuclear or nuclear dual-use items will create new possibilities for proliferators, particularly Iraq or Iran, to clandestinely and cheaply obtain know-how or equipment for nuclear weapons programs. Irresponsible or desperate companies or individuals may seek to capitalize on these opportunities.

Over the horizon, the picture remains uncertain. At some point soon the United States will have to decide whether or not to deploy a limited national missile defense (NMD) system to defend against a small attack launched by North Korea, Iran, or other so-called rogue regimes. That the United States is even considering an NMD system has already come under criticism by Russia, China, and France, three countries the United States must work with on a broad spectrum of nonproliferation efforts. In addition, an NMD may greatly diminish the chance that the nuclear weapon states will achieve deep nuclear reductions or disarmament, further weakening the NPT. Should a missile defense be deployed, proliferators are likely to intensify their efforts to build nuclear weapons and either to develop effective countermeasures against missile defenses or to find other ways than missiles of delivering weapons of mass destruction.

Conclusion

As we enter the twenty-first century, many proliferation challenges remain. Efforts to strengthen the nonproliferation regime have not eliminated opportunities for countries seeking nuclear weapons. However, the international community is better informed about the risks of nuclear proliferation, and nonproliferation efforts are more sophisticated than ever before. Nations, particularly the United States, can build on half a century of crafting solutions to these difficult challenges. As the past has taught us, however, success will not come easily.

Redressing Deficiencies in the Nuclear Nonproliferation Treaty

John Simpson is the program director of the Programme to Promote Nuclear Nonproliferation (PPNN). PPNN is an international networking organization with its administrative base at the Mountbatten Centre for International Studies, the University of Southampton, in the United Kingdom. It seeks to generate new ideas for strengthening the NPT and to introduce these ideas to international forums. PPNN has used funding from the United States Institute of Peace to mount major international seminars to brief senior national officials from around the world and to provide them with relevant information and documentation. These seminars took place shortly before the meetings of the Preparatory Committee for the 2000 NPT Review Conference in 1998 and 1999 as well as the 2000 conference itself. The following discussion points to the role of PPNN in broader nonproliferation efforts.

The NPT's Institutional Weaknesses

by
John Simpson

Most recent international arms control treaties have formal mechanisms for monitoring and verifying their implementation and for providing secretariat and information services to states parties. The Nuclear Nonproliferation Treaty (NPT), which was signed in 1968 and remains the cornerstone of the nuclear nonproliferation regime, has no such permanent institutions. Rather, it relies on the inadequate functional substitute of a conference of the parties, which meets every fifth year to review its operations, and it uses verification services provided by the independent International Atomic Energy Agency (IAEA) to monitor states parties' peaceful use of the fissile materials within their territories.

This absence of any permanent treaty mechanisms has two major implications for the viability of the NPT. First, the IAEA has only limited verification responsibilities in respect of this treaty. Although the agency is charged with verifying the fulfillment of a state's obligations under the NPT with a view to "preventing diversion of nuclear energy from peaceful uses to nuclear weapons or other nuclear explosive devices," it is not responsible for monitoring whether other aspects of a state's obligations under the treaty are being fulfilled. These obligations include nonnuclear weapon states (NNWS) not acquiring nuclear weapons or other nuclear explosive devices from nuclear weapon states (NWS) or engaging in the process known as weaponization (i.e., developing the nonnuclear components of nuclear weapons indigenously). Thus, while the 1995 NPT Review and Extension Conference confirmed that the IAEA is the competent authority to verify that the NPT's safeguards agreements with states parties are not being breached, it remains unclear who should verify compliance with other aspects of the treaty.

The second major implication is that there is no intergovernmental body either to monitor the health of the treaty and its related regime or to provide focused information to states on events connected with the multiple facets of nuclear nonproliferation. These include areas such as nuclear disarmament, peaceful uses of nuclear energy, nuclear supplier regimes, nuclear weapon–free zones, and security assurances. Developments in all of these areas impinge on the viability of the NPT. Also, the NPT has no technical groups of experts to provide information that could improve the transparency of the regime, or a state's ability to demonstrate compliance with it. In some cases, this lack of access to objective political and technical information could threaten to undermine confidence in the regime by denying to a state party the tools to evaluate the compliance of others with the treaty. In such circumstances, misunderstandings could arise concerning the actions of such states, and lead to inappropriate actions with regard to the treaty itself.

Two obvious questions are why do states parties themselves not create an organization to perform these tasks for NPT members, and why do they not ask the United Nations or the IAEA to undertake these tasks? There are three main answers for the first question: the treaty is very difficult to amend; complete consensus on the nature, powers, and composition of such a treaty organization would be needed among the 187 states parties before it could be created; and many states are reluctant to agree to the creation of a body that might be used to make judgments on their own compliance with the treaty. Thus the necessary support to create such a treaty organization is unlikely to be forthcoming. As for the United Nations and the IAEA undertaking these tasks, both contain nonparties to the NPT and thus are seen as inappropriate to provide a secretariat for those who are. However, both organizations have a role to play in NPT conferences, with the United Nations being contracted by the parties to provide the venue and support staff for them at an agreed price.

Bridging the Gap: PPNN's Role

Nongovernmental organizations are unlikely to have the resources to fill the gaps that exist in the scope of the verification mechanisms associated with the NPT. They could, however, tackle the challenges that exist with respect to monitoring the regime, providing information to the states parties, facilitating meetings of NPT parties, and generating new ideas for implementing the treaty. It is these needs that PPNN has been seeking to fulfill for NPT states parties for over a decade.

To undertake these tasks, PPNN has access to a group of experts on the NPT and the nuclear nonproliferation regime who represent the geographical spread of NPT parties; who have the knowledge, experience, and ability to develop new ideas to implement the treaty; and who have the authority to brief senior national officials on past and current NPT review activities and issues. This group of experts is known as the PPNN Core Group. It currently comprises individuals from eighteen countries.

The role of monitoring the regime and providing information on developments within it has been mainly performed by PPNN's publication program, comprising its quarterly *Newsbrief, Briefing Books,* and *Issue Reviews.* The *Newsbrief* seeks to keep the international community informed of events affecting all aspects of the nuclear nonproliferation regime, while each edition of the annual *Briefing Books* provides information on

developments within the regime and reproduces pertinent documentation relating to it. *Issue Reviews* provides information and analyses regarding specific issues confronting the regime, and in particular the NPT Review Conferences and their Preparatory Committees (PrepComs). All of these materials are important and useful to those developing states that lack library and other research facilities.

The role of facilitating NPT meetings is performed in part through PPNN's information program, but more particularly through its provision of forums at which potential national delegates can meet informally to discuss issues and seek solutions to problems. This work centers on its international meeting program, which has sought to assist NPT states parties in recognizing their common interests in maintaining support for the treaty. Given that there are 187 states parties with a very wide range of views and perspectives, PPNN does not, and could not, attempt to advocate particular ways of addressing issues. Its work is premised on the belief that broad and informed participation of states parties in the NPT review process bolsters the legitimacy of decisions made within that process; that a variety of approaches to problems can usefully be discussed ahead of the formal meetings, before negotiating instructions and diplomatic protocol preclude effective debate; and that personal relationships between diplomats can encourage deeper understandings of other states' positions and assist in making compromises in the tense and sometimes highly charged atmosphere of a Review Conference itself.

PPNN's meeting program has consisted of international briefing seminars, Core Group meetings, and workshops. The briefing seminars have involved members of PPNN's Core Group and other relevant experts informing those senior national officials likely to head delegations to NPT meetings about the issues that might arise there and providing them with analyses to help them address problems. At the same time, these forums allow these officials to discuss the issues that most concern them. Such discussions take place not only in the more formal sessions but also, and perhaps more important, in informal contexts. In such discussions, officials can talk frankly and openly with their opposite numbers in different delegations and form personal relationships that can increase the flexibility of their state in formal NPT meetings.

At its Core Group meetings and workshops PPNN draws together diplomats and researchers to analyze particular issues and seek ideas for solutions that can later be presented to the wider international community. In addition, members of PPNN's Core Group have a role at PPNN seminars and in NPT meetings as an institutional memory for those diplomats who are new to the field of nonproliferation. More particularly, PPNN has sought since 1995 to encourage analysis and debate on how the "strengthened" review process, agreed on at the same time the treaty was made permanent, could be most effectively implemented.

PPNN's latest briefing seminar was held in March 2000 in Princeton, New Jersey, and was targeted at diplomats stationed at the United Nations in New York and at the Conference on Disarmament in Geneva. The seminar emphasized the negative consequences of not agreeing on a consensus product from the conference, as this event would call into question the agreements reached in 1995 on the indefinite duration of the treaty and the strengthened review process. The seminar also addressed the substantive issues on which states parties would have to forge a consensus, such as how to bring nonparties into the

treaty, new nuclear disarmament initiatives, allegations of noncompliance with the treaty and how to deal with them, proposals for new nuclear weapon–free zones, strengthened security assurances for NNWS, initiatives to strengthen the IAEA safeguards system, peaceful-use issues such as agreements not to attack nuclear facilities, maritime transport of nuclear materials and waste, and controls over nuclear exports to nonparties.

The Impact of PPNN at the 2000 NPT Review Conference

The impact of those PPNN activities that can be seen to substitute to some extent for the NPT's lack of executive and secretarial mechanisms is hard to quantify. The main focus of PPNN's work before April 2000 was to encourage a successful outcome to the NPT Review Conference in that year. To this end, from 1997 to 2000 PPNN briefed more than 250 diplomats from over sixty countries on issues that were likely to be addressed by the NPT Review Conference and its PrepComs. It produced four editions of volumes I and II of its *Briefing Book,* which were distributed to all delegations of states parties; eight editions of its *Issue Reviews* pertinent to the NPT Review Conference; and fourteen editions of its *Newsbrief.* Copies of the latter two publications were distributed to approximately twenty-five hundred addressees on PPNN's mailing list.

At meetings of the NPT Review Conference and its Preparatory Committees the direct effects of PPNN's activities were fivefold. First, PPNN staff members distributed key PPNN publications at the meetings, giving all delegations factual information on which to base their policies in the very fluid and rapidly evolving context of an international conference. PPNN staff members at the conference provided further information and advice when requested. Second, eight members of its Core Group attended the conference as delegates and were thus able to play an influential role in its outcome. Third, a large number of key delegates already knew each other personally through their attendance at PPNN meetings, and this may have helped some delegations to adopt a more flexible stance. Fourth, PPNN's reputation as a knowledgeable and objective organization led the president and his committee chairmen to seek advice from PPNN staff members before and during the conference, which may have influenced their planning and conduct of it. Finally, and perhaps most important, those delegates who had attended the PPNN meetings came to it with an enhanced understanding of the significance of the NPT, the importance of the Review Conference for the nuclear nonproliferation regime, the difficulties that they were likely to face, and various ways in which those difficulties might be addressed. Its meetings may also have encouraged some states to seek agreement on major issues of contention before the conference, either independently or through the president, and thus smoothed the path to the first NPT Final Document since 1985.

Conclusion

Most delegates attending the 2000 NPT Review Conference deemed it successful primarily because it agreed by consensus on a forward-looking "Action Plan" for nuclear disarmament. It also minimized the impact of the procedural difficulties that had threatened to dominate the proceedings by either tackling them before the conference or successfully navigating around them. Agreement was also reached on how to handle a number of thorny substantive issues that had threatened to make a consensus outcome impossible,

such as those relating to the Middle East, Iraq, South Asia, and a U.S. national missile defense system. All were either resolved or put to one side for the sake of a successful conference.

PPNN thus believes that its work contributed to the successful outcome of the conference by helping states parties to overcome their inability to agree on the creation of a formal treaty organization. The likelihood that a permanent organization for the NPT will be established in the future is still remote, and the information needs PPNN has sought to address seem likely to persist. In the meantime, PPNN is seeking to continue its work by focusing its activities on how to implement the new NPT Action Plan on nuclear disarmament.

Technology and the Development of New Regimes

Lessons from the Missile Technology Control Regime

This project draws heavily from the author's decade-long work in the Office of the Under Secretary of Defense for Policy while the Missile Technology Control Regime (MTCR) was being negotiated. The project investigates the negotiations that led to the MTCR, focusing on the process and substance of the talks. Speier also relies on documents released to the author in 1995 under the Freedom of Information Act for the history of these negotiations.

The Dilemmas of Dual-Use Technology

Missile nonproliferation is different from most other "nonproliferations." While the vast majority of governments would like to see the world entirely free of chemical and biological weapons—and ultimately of nuclear weapons—there are "good" and "bad" missiles. Some are defensive, some are utilized for scientific or commercial purposes (and are called sounding rockets or space launch vehicles when they are used for the latter), and some—like U.S. cruise missiles—deliver conventional munitions with such precision that they can avoid hitting nonmilitary targets.

by
Richard Speier

Moreover, the equipment and technology used to make missiles often have important civilian applications. The Global Positioning System, a constellation of satellites and equipment that provide astonishingly precise location and time information, is used not only by missiles but also by airline pilots, surveyors, hikers, and drivers of luxury automobiles.

Therefore, missiles and the technology they embody are examples of dual-use items, items that cannot entirely be banned without losing valuable functions. The international export control policy (and associated practices) to control missile proliferation is the Missile Technology Control Regime. The nature of the regime and the negotiations that led to it offer lessons in how the proliferation of dual-use items may be controlled.

Negotiating the MTCR

The international negotiations leading to the MTCR were conducted in secrecy for four and a half years, from late 1982 to early 1987. On April 16, 1987, the Western Economic Summit (G-7) partners announced the policy—directed against the proliferation of "nuclear-capable" missiles. The regime had its origins in U.S. concerns, beginning in the 1960s, with the gradual spread of missiles and their technology to potential nuclear proliferators. Many of the issues involved the development of space launch vehicles (SLVs),

a perfect example of dual-use technology. With a change of payloads and guidance instructions, they can serve as long-range ballistic missiles.

In 1982 the Reagan administration promulgated National Security Decision Directive 50 (NSDD-50), which set forth nearly twenty objectives for keeping "peaceful" space cooperation peaceful. NSDD-50 with its relatively scattered policies offered no useful guidance for preventing missile proliferation. That came later in 1982 with NSDD-70. NSDD-70 had a single objective, that is, to "hinder" the proliferation of nuclear-capable missiles. It defined these to include ballistic and cruise missiles as well as "ostensibly civilian" versions of them. It directed relevant U.S. agencies to work with other supplier governments toward this objective.

The U.S. preparations for such talks featured a theme that persisted during much of the next four and a half years: a love-hate relationship between the State Department and the Department of Defense (DoD). (The author worked for DoD on these negotiations during this period.) The State Department wanted an agreement and was willing to make compromises on the policy. DoD wanted uncompromising nonproliferation, with or without a formal agreement with the other members of the G-7.

As an example, State began with a draft policy on missile export controls that allowed every decision to be made on a case-by-case basis, with multiple objectives for each decision. DoD responded with a "short list of denials" that enumerated a few items (including missiles, space launch vehicles, and their major components and production facilities) that would be subject to a total export embargo. Moreover, DoD set forth a technical definition of unmanned systems that would be subject to such draconian controls. This became the "Category I" list—unmanned systems, regardless of purpose, that are capable of delivering a 500-kilogram payload to a range of 300 kilometers.

Within months, DoD's Category I list was accepted by the seven supplier governments as the focus of the regime being negotiated. Other dual-use items were placed into a longer "Category II" list, a list of items subject to case-by-case export decision. There was a potential for weakness in the Category II controls, but this was minimized by the requirement that such exports not contribute to Category I systems.

Subsequently, the contentious issue became the rules that should apply to Category I exports. State and DoD locked horns, with State insisting that an embargo was nonnegotiable and DoD insisting that nothing less was worthwhile. For nearly a year during 1984 the other members of the G-7 waited in puzzlement while the United States apparently did nothing—except to wage intense interagency warfare. The issue ultimately moved into the international arena—not to be resolved until 1986. The solution was to place a total prohibition on exports of production facilities for Category I items and to establish a "strong presumption to deny" export of other Category I items—with strict rules for the conditions under which such "rare" exports could be made.

Another persisting question related to the perennial dual-use dilemma of SLVs. Once SLVs made the Category I list, some negotiating partners became uneasy about applying the same rules to them as to ballistic missiles. It took one and a half years before these governments admitted that the laws of physics offered no other approach.

In short, many of the most important MTCR negotiations took place within the U.S. government. The dual-use nature of some of the items, such as SLVs, forced an enormous

amount of attention to be given to the interplay of controls and the list of items to be controlled.

The MTCR's Approach to Dual-Use Controls

Some of the approaches embodied in the MTCR reflected the experience of the only other nonproliferation regime then in existence—that dealing with nuclear weapons. Just as the Nuclear Nonproliferation Treaty (NPT) proscribed the further spread of nuclear weapons, so the MTCR proscribed the further spread of missiles capable of delivering them. Just as the NPT set tight controls over "peaceful nuclear explosions"—the civilian equivalent of nuclear weapons—so the MTCR set tight controls over SLVs. And just as the nuclear regime (including the Nuclear Supplier Guidelines) set looser controls over dual-use exports, so did the MTCR.

But there were differences. The MTCR established a "no-undercut rule" under which a government that denied an export would so notify the other members of the regime, and each other member would issue similar denials unless it first consulted with the original denying party. This innovation was attractive because it reassured exporters that any sacrifices they made would not be neutralized by other regime members. The innovation made so much sense that the no-undercut rule was adopted in the Nuclear Supplier Guidelines when they were extended further into the dual-use area in the early 1990s. The no-undercut rule and the other MTCR restrictions were to be kept alive by frequent information exchanges among regime members in order to encourage a common appreciation of the prevailing elements of the missile proliferation threat.

The MTCR's Category I list and its corresponding controls set a standard for dealing with the most lethal commodities. But, perhaps because of the difficulty in negotiating them, they have not been reflected in subsequent nonproliferation efforts. Nevertheless, without such stringent Category I provisions, the MTCR could lose its focus and become little more than a gesture.

Following the Persian Gulf War, the MTCR coverage was broadened from nuclear-capable missiles to missiles capable of delivering nuclear, chemical, or biological weapons. The regime's membership grew from the original seven to the present thirty-three, with Israel unilaterally adhering to its guidelines and China issuing rather ambiguous formulations of its commitment to observe the MTCR's "guidelines and parameters." To date, of the major suppliers of missile technology, only North Korea has remained aloof from the MTCR's provisions.

Even without North Korea's participation, the MTCR can claim credit for curtailing several programs, such as the Argentine-Egyptian-Iraqi Condor II missile program (a clone of the Pershing II based on technology exported by Western European firms); the South African ballistic missile/SLV program; and the Central European Scud and SS-23 programs. In addition, as a result of a U.S. sanctions law enforcing MTCR objectives, many other missile programs have been contained. Recent years have seen some spectacular examples of missile proliferation, but without the MTCR in place, it would undoubtedly have been far worse.

A frequent criticism of the MTCR has been that, because it is not enshrined in a treaty, it can readily be ignored. However, a treaty or a policy (the MTCR is the latter) is as strong

as its enforcement. As long as governments back the regime commitments with information exchanges, démarches, and even sanctions, there is no reason why a policy cannot function as effectively as a treaty. Dual-use technology controls, with inherent flexibility in their application, would be extremely difficult to formulate as inflexible treaty commitments.

Lessons Learned for Future Negotiations

A few of the most outstanding features of the approaches to MTCR negotiations were the following:

- w**A clear objective.** The MTCR defined Category I items with engineering precision and focused its most powerful restrictions on their export. Even the dual-use Category II controls were keyed to the Category I objective. This gave teeth to the regime in a way that seventeen objectives and case-by-case decision making on all exports could never have done.

- w**Rules appropriate to the objective.** It would have been easy to put dual-use SLVs on the Category I list and then allow their export under minimal restrictions. But at the cost of prolonging the negotiations, this was resisted and a consistent regime created.

- w**A no-agreement option.** DoD provided strong backing to the U.S. position by insisting that it would be better to have no agreement—and to oppose missile proliferation by individual démarches not based on an international policy—than to have a weak agreement that somehow legitimized such exports as those of SLVs. It is essential to resist the urge to reach agreements "at any cost."

- w**U.S. leadership.** The United States is the eight-hundred-pound gorilla in international negotiations. Once it takes a position and advocates it strongly, other nations' "political constraints" tend to melt away.

- w**Eternal vigilance.** The details made a difference. By indefatigably attending to them over four and a half years, the negotiators of the MTCR created a worthwhile international standard.

Managing Technology Transfers in a Proliferation Environment

The Case of the Biological and Toxin Weapons Convention

Jean Pascal Zanders directs the Chemical and Biological Warfare Project of the Stockholm International Peace Research Institute (SIPRI) and he is the principal investigator for a joint project by the Federation of American Scientists (FAS) and SIPRI under which this research has been done. Zanders explores the existing regimes and mechanisms of technology transfers relevant to the Biological and Toxin Weapons Convention and investigates how they affect the possibility of offering gains to potential member-states. He also looks at possibilities to verify that the transactions are not misused for purposes prohibited under the convention.

Technology Transfers and Economic Development: Developed- versus Developing-Country Views

by
Jean Pascal
Zanders

The industrialized world has recast arms control and disarmament as not only ends in themselves, but as two mechanisms among several policy instruments for stemming the proliferation of unconventional weapons. This points in part to the increased importance of economic interactions (in the form of dual-use technology transfers). A similar shift of emphasis has occurred among industrializing countries. The 1972 Biological and Toxin Weapons Convention (BTWC) and the 1993 Chemical Weapons Convention (CWC) are true disarmament treaties in the sense that they eliminate an entire class of weaponry and possess mechanisms to prevent the use and acquisition of such weaponry. Yet the industrializing countries have increasingly judged the relevance and success of such agreements by the contribution they make to the development of their societies. The fact that in most cases these countries do not have any stockpiles to destroy or do not face an immediate threat with the weaponry under consideration only reinforces the viewpoint.

The insertion of an economic dimension (in the form of a promise of development) has a long history in the control of armaments. Peace and international cooperation are part of the core purposes and principles of the United Nations and are consequently reflected in the arms control agreements achieved under its auspices. Articles II and III of the Statute of the International Atomic Energy Agency (which entered into force on July 29, 1957) emphasize the acceleration and enlargement of the contribution of atomic energy to peace, health, and prosperity throughout the world. The wording of the provisions in Articles III and IV of the 1968 Nuclear Nonproliferation Treaty (NPT) to avoid hampering the economic and technological development of states parties and their right to

participate in scientific and technological exchanges is repeated almost verbatim in Article X of the BTWC and reflected in Article XI of the CWC. As the reach of these agreements is global, it is inevitable that the interests of states parties may differ depending on their geographical location.

Moreover, arms control and disarmament treaties should not form a pretext to consolidate a monopoly over the possession of a particular technology by a single state or a group of states. This was part of the philosophy of the New International Economic Order (NIEO), as it was enshrined in the Charter of Economic Rights and Duties of States in December 1974. Although it was controversial and its implementation ultimately blocked by the political swing to the right in most industrialized nations at the end of the decade, it had a delayed impact on the BTWC. Members of the Non-Aligned Movement (NAM) invoked the NIEO principles at the periodic review conferences in the 1980s and thus contributed to deepening the understanding of Article X of the BTWC. Initially, however, the argument (with respect to the BTWC) appeared formalistic as the NAM countries raised the point only at the quinquennial review conferences and not during the periods in between.

Another argument that helped to shape the debate was the belief among the industrializing states, and the NAM members in particular, that the reversal of the costly arms races would free up money to invest in the development of poorer nations. The notion of general and complete disarmament was thus linked to social, economic, and technological development in the 1960s. Although disarmament has meanwhile proved to be expensive in monetary terms, an underlying expectancy of automatic financial or technology transfers as an integral part of a disarmament treaty is still present in the mind-set of many developing countries.

Not only are these elements relevant to the further development of the NPT and CWC regimes, but they also play a significant role in the current negotiation on a protocol additional to the BTWC. With the CWC, the debate on technology transfers, assistance, and development has become permanent and institutionalized. The experience of the concrete implementation of Article XI of the CWC is a major component of the debate on how to organize a meaningful implementation of Article X of the BTWC.

The Biotechnology Revolution and Its Impact on the Debate

One of the reasons why the BTWC was achieved was the widespread view in the early 1970s that biological warfare was impractical. Since then biology and biotechnology have made great leaps forward. The current debates on the emerging biological weapons (BW) threat interact with other issues, such as emerging and reemerging diseases or environmental degradation, that touch societies in all parts of the world. Because of the role biotechnology plays and will play in the development of a society, the future BTWC regime will also affect the sectors of economic, political, and societal security. The interest of many countries in participating in the future BTWC regime would then be determined not by threats from BW, but by, for example, the right to participate in international exchanges and to have access to the new biotechnologies that could help countries to

counter societal threats and to enhance their economic, environmental, and political security.

The goal of universality for the future protocol to the BTWC implies the accommodation of the various security interests (economic, environmental, military, political, or societal) states parties may deem important based on the nature of their interactions with other states, their geographic location, and their level of development. From this angle, meaningful implementation of Article X of the BTWC through Article VII of the protocol will be crucial. Article VII of the protocol corresponds to Article X of the BTWC. Article VII relates directly to "scientific and technological exchanges for peaceful purposes and technological cooperation." Moreover, the benefits must be real and, at a minimum, be able to offset the financial cost a state will incur by becoming a party to the protocol (e.g., to finance the future international organization).

Some of the measures under consideration for Article VII of the draft protocol include assistance with national implementation of the protocol, technology and scientific exchanges, regional seminars, the establishment of a biotechnology database and communications network, disease surveillance, and the creation of a Cooperation Committee within the future Organization for the Prohibition of Biological and Toxin Weapons to organize and oversee the implementation of these cooperative activities.

However, Article VII may have only a limited appeal to states to join the protocol: states can obtain many of the prospective benefits through other international organizations or arrangements, such as the World Health Organization, the World Trade Organization, and the Convention on Biological Diversity. Furthermore, many states argue that they already have programs running that can be considered as concrete implementation of Article X of the BTWC. Relevant technologies are also transferred on the level of companies rather than states through the establishment of subsidiaries, direct investment, licensing, or participation in a variety of local initiatives. Whatever the motives or the content of the transactions, the transfers are taking place. If the protocol is to achieve universality, the crucial question thus becomes what extra benefits states may obtain under Article VII. The CWC contains an additional incentive: nonstate parties are denied access to certain listed toxic chemicals, which may have important commercial or industrial applications (Article VI). A similar provision in the future protocol to the BTWC may be objectionable on ethical grounds, especially if it would relate to human health, food security, and so on.

The BTWC is a typical Cold War agreement. When it entered into force in 1975 the dynamics of the international system focused on the global ideological struggle between the Soviet Union and the United States. The disappearance of a principal organizing force on the global level resulting from the end of the bipolar rivalry has contributed to the regionalization of conflict management and resolution. A weakening of the commitment to global engagement by the larger powers, save in the case of strong and immediate national interests, has reinforced the trend. The steady diffusion of knowledge and technology enables regional state actors to enlarge their political, industrial, and military capabilities, which, in turn, will affect regional power balances. These developments have reinforced existing concerns about proliferation.

The response of many industrialized nations has been to strengthen nonproliferation measures. Evidence of the involvement of many Western companies in Iraq's and Libya's

chemical weapons programs prompted the introduction of export controls on certain key chemicals needed to manufacture the warfare agents. Some Western countries began meeting informally in the so-called Australia Group to coordinate their national export control policies. The common lists of controlled goods gradually expanded to cover equipment and technologies relevant to BW. The initial goal of the Australia Group was to slow down the proliferation process until the conclusion of the negotiation of the CWC. Today, the rationale has shifted and the arrangement has acquired a more permanent, if still informal, status. Its control lists contain technologies not covered by the export control mechanisms of the CWC as well as technologies of relevance to the manufacture of BW. The BTWC has no export control provisions at all.

Today, nobody denies the relevance of the nonproliferation clauses in the CWC and the BTWC. However, the existence of export control mechanisms outside the disarmament treaties directly challenges the assumptions that originally led to the inclusion of economic and development assistance into arms control and disarmament treaties. Developing countries have a strong sense that national export control regulations, whether or not coordinated among a number of states, introduce arbitrariness into their ability to have access to relevant technologies and that their commitment to disarmament is not rewarded. Progress toward resolution of the issue is not helped by the fact that the disarmament treaties grant states parties only the *right* of access to such technologies (and not an *obligation* of transfer) for nonprohibited purposes. Furthermore, while the treaties contain a nonproliferation clause, as of today they do not indicate how states parties must concretely implement the provision. They do not state that only treaty provisions can form the basis for nonproliferation measures, nor do they state that measures outside the treaty regime are prohibited. The question is therefore high in ideological content, a quality that considerably hinders the finding of an equitable solution.

Preliminary Findings

A key finding is that in the post–Cold War environment, with its increased attention on proliferation, the concept of verification needs to be expanded, if not reconsidered. Verification mechanisms in arms control and disarmament are traditionally tailored to certify—depending on the type of treaty—the absence or presence of treaty-controlled items and their destruction if so required. In addition, other verification mechanisms can be included to monitor the use or consumption of certain goods that may pose a threat to the treaty objectives. Under the future BTWC regime, an important part of the verification process will have to focus on keeping technology transfers as transparent as possible (and thereby contribute to the building of confidence). Because of the nature of biotechnology and the minute amounts of pathogens needed to start up research, development, and production, it is highly unlikely that a mechanism of accounting of material balances like the one used under the nuclear safeguards system can be adapted to monitor BTWC-relevant transfers. (The model already proves to be problematic under the CWC.)

Proliferation studies focus principally on the transfer patterns of tangible objects, such as agents and equipment, and the threat of the immediate realization of the dual-use potential of these objects, whereby the recipient countries (or substate actors) of concern acquire technology developed for civilian use and instantly apply it for the purpose of

acquiring BW. Yet at the core of the biotechnological revolution is information: data collection and processing, knowledge, techniques, and skills. Moreover, biotechnology produces enabling technologies for many civilian applications that contribute to future information accumulation and product and process improvements. This information core permeates the society in which the development takes place. However, with today's globalization and growing interdependence it inevitably diffuses across national borders. While lateral proliferation processes are undeniably taking place, the greatest challenge to the future BTWC regime may actually come from a sudden massive application of civilian biotechnology for the purpose of acquiring a biological warfare capability within a state party that faces a serious security threat.

If the protocol to the BTWC is to remain relevant for many decades to come, it will require new mechanisms to deal with this possibility of instant realization of the dual-use potential of biotechnology within a state party. In addition to the traditional verification and monitoring of the destruction and nonproduction of BW in states parties, it will have to incorporate an understanding of biotechnology and technology transfer processes that goes beyond mere products (agents, production equipment, etc.). The aim of this new set of tools is to render transparent technology transfers between economic units (e.g., individuals, laboratories, and companies) within a member-state and between economic units across national boundaries (including states and transnational companies and organizations). All economic units involved in a transaction will share the responsibility of ensuring that the dual-use potential of the technologies is not realized. The explicit commitment by the economic unit, whether a supplier or a recipient, to uphold this responsibility will then become a key component for granting the transfer license. The principle also applies to scientific and student exchanges as in-depth background knowledge will enhance the transparency of the institute's and the individual's activities. The national authorities and the international organization to be set up under the protocol will monitor the transparency of all relevant technology transfers. This mechanism of shared responsibilities between suppliers and recipients can facilitate assistance to countries such as Russia as confidence in the compliance with the BTWC grows, while making it much harder for future Iraqs or representatives of terrorist organizations to acquire the BW-relevant technologies.

This set of tools will nonetheless have to be supplemented with extensive positive security guarantees in order to reduce the disproportionate military advantage a state party might gain from defecting from the treaty. These guarantees do not only entail the right of access to assistance and protection (subject to the transparency conditions mentioned), but also involve dynamic decision-making procedures to allow states parties to respond swiftly and decisively in the case of a rapidly developing crisis. If adequately implemented, the mechanisms to enhance the transparency of technology transfers may be able to provide sufficient advance warning of an impending massive transfer of civilian technology for prohibited purposes.

A second key finding is that the concept of security can no longer be limited to "military security." It involves several layers such as personal security, economic security (for companies, states, etc.), societal security (including health issues, food, and water security), political security (regime survival), environmental security, and so on. One only has

to look at the AIDS disaster in some African countries to understand how these different levels are intertwined. The future BTWC regime will impact on each of these levels as a consequence of the dual-use potential of biotechnology, on the one hand, and the fast-growing impact of biotechnology on the quality of the human condition, on the other hand. This implies that the operation of the international organization for the prohibition of biological and toxin weapons to be created under the future protocol will have to be integrated in the broader set of international organizations active in the various dimensions of security, such as the World Health Organization, the World Trade Organization, and the United Nations Development Programme.

The United Nations Special Commission (UNSCOM) Experience

Jean Krasno is the associate director of United Nations Studies at Yale, Yale University, and James S. Sutterlin is distinguished fellow in the program. This project evaluates the experience of the United Nations Special Commission (UNSCOM) established to investigate and eliminate Iraq's weapons of mass destruction. The research is based on primary documents from the United Nations and elsewhere, as well as interviews with UNSCOM participants, International Atomic Energy Agency (IAEA) staff, and other involved parties.

The Security Council's Unprecedented Action

In adopting Resolution 687 on April 8, 1991, the United Nations Security Council embarked on an unprecedented program to deprive permanently, by force if necessary, a member-state of weapons of mass destruction. Following World Wars I and II, the victors eliminated or severely limited entire military establishments of the defeated powers without the latters' consent and without concern for their sovereignty or, in most cases, their borders. By contrast, in demanding the elimination of Iraq's weapons of mass destruction (WMD), the Security Council acted on behalf not only of the victors but also of all member-states, while at the same time affirming their common commitment "to the sovereignty, territorial integrity and political independence . . . of Iraq."

Under the coercion of disastrous defeat and the threat of renewed attack, Iraq was brought to accept the terms of the Security Council's resolution. The case can therefore be made that the conditions of peace were not "imposed" as in the case of the Treaty of Versailles. Yet the council made clear that, in adopting the punitive measures of Resolution 687, it was acting under Chapter VII of the UN Charter. Through this action, the council declared, in effect, that the possession of weapons of mass destruction by Iraq constituted, and would continue to constitute, a threat to international security. Furthermore, by implication, the council would be justified in taking forceful measures, in addition to the sanctions already in effect, should Iraq fail to comply with the provisions of the resolution. What the resolution did not do was to limit in any way the military force of Iraq other than its weapons of mass destruction.

Resolution 687, in its disarmament provisions, contains contradictions that were necessary for both its adoption and its effectiveness but were destined to cause problems if, as it turned out, all of the objectives of the resolution were not expeditiously accomplished. The permitted retention by Iraq of a strong conventional military force reflected the intent to allow Iraq to maintain its independence, but hardly its sovereignty as promised in the preamble to Resolution 687. Iraq's concurrence in the resolution's provisions gave the

by
Jean Krasno
and
James S.
Sutterlin

resolution something of the quality of a treaty agreement between two parties, but it was not, and is not, a treaty between equals.

These contradictions afforded Iraq endless opportunities to claim that various UN-authorized actions were in violation of its sovereignty that had been assured by the Security Council. Ultimately, the contradiction would engender destructive disagreement in the council when the United States and the United Kingdom applied military force without specific council endorsement in an effort to force Iraq to comply with disarmament provisions to which it had earlier agreed.

A Novel Disarmament Instrument

The various departments and agencies in Washington that took the lead in setting the terms for a formal cease-fire with Iraq were determined to accomplish the permanent elimination of Iraq's weapons of mass destruction and, in the process, to weaken Saddam Hussein's position to the greatest extent possible. There was little understanding, however, on how the United Nations could facilitate these purposes. The American who knew best how to go about the problem was the U.S. permanent representative to the United Nations, Tom Pickering. The task fell primarily on him to draft and, together with his British colleague, Sir David Hannay, obtain agreement on the disarmament provisions of Resolution 687 (Section C). It was a remarkably deft job given the lack of precedents and the spotty, and sometimes false, information available in Washington and other capitals on the extent of Iraq's WMD arsenal. There was wide knowledge that Iraq had a significant chemical weapons capacity and a supply of long-range Scud missiles since Iraq had employed them both against its enemies. The Desert Storm forces concluded—mistakenly—that they had destroyed most of the Scud missiles and rendered harmless the main chemical weapons installation. The United States and presumably its NATO partners had reason to suspect that Iraq was trying to acquire a nuclear capacity, but they were unaware of the progress that Saddam Hussein had made toward this goal. Nothing was known of Iraq's biological weapons program.

It is remarkable that under these circumstances Section C of Resolution 687 is so comprehensive and foresighted. The structure of UNSCOM is left vague and the relationship between the IAEA and UNSCOM would seem to invite friction (as for a while it did). However, three essential objectives were accomplished: (1) all weapons of mass destruction to be eliminated were clearly identified, whether their existence was known or only suspected; (2) UNSCOM, in the plan submitted by Secretary-General Javier Pérez de Cuéllar as called for in Resolution 687, was established with a chairman having executive powers, meaning he was free to make all essential decisions regarding UNSCOM's operations without consulting the other members of the commission; and (3) the resolution designates the director-general of the IAEA (not the IAEA as an organization) to carry out the inspections of Iraq's declared nuclear capabilities and any additional sites identified by UNSCOM. Thus the director-general was independent of the geographically representative IAEA Board of Governors and needed to work closely with UNSCOM since only UNSCOM was authorized to identify undeclared sites where nuclear equipment might be hidden.

UNSCOM as Model and Precedent

UNSCOM developed a number of innovative contributions to the process of arms control through technological means, recruitment of experts, and analytical methodology. For the inspection procedure, the IAEA, because of its nuclear expertise, was charged with uncovering and destroying Iraq's nuclear weapons capacity as declared by the Iraqi government and as identified by UNSCOM. Although it was primarily responsible for the elimination of long-range missiles and chemical and biological weapons, UNSCOM (and only UNSCOM) had the mandate to identify suspect undeclared sites for inspection. Thus the IAEA was to a significant extent dependent on, and subordinate to, UNSCOM in the search for nuclear weapons and equipment.Like the assignment of the nuclear mandate directly to the IAEA director-general, this was done so that the IAEA's Board of Governors would not be able to compromise the independence of the IAEA mission.

Because the missile delivery system technology often overlapped with nuclear research and development,inspection teams often included both IAEA and UNSCOM personnel. Cooperation was initially prejudiced by the low opinion widely held in UNSCOM of the effectiveness of IAEA inspection procedures, which had failed to detect the diversion of nuclear fuel for military purposes. The IAEA director-general quickly tightened procedures,however, and the two organizations subsequently worked effectively together.

UNSCOM developed its own independent Information Assessment Unit (IAU) at UN Headquarters in New York. There UNSCOM staff members were able to piece together fragments of information from myriad sources and fit them bit by bit into a picture puzzle of Iraq's arsenal of weapons of mass destruction and its methods of concealment and deception. The UNSCOM operational process can best be described as falling into three categories: (1) the reception and organization of information from its own inspectors plus contributing sources,including governments,industrial suppliers, and defectors; (2) the utilization of technical means of information gathering; and (3) the analysis carried out by UNSCOM's IAU. Knowledge of Iraq's WMD program improved as layers of information accumulated. UNSCOM invited the world's top experts on each aspect of weaponization to participate in the inspection process. This was the first time that such a pooling of expertise was brought together for arms control verification. The first inspections ever undertaken on biological weapons were carried out in Iraq under UNSCOM auspices. (The supply of experts in this field was very limited.)

UNSCOM developed a unique discovery and monitoring process. On the ground, UNSCOM had its international teams of inspectors, which included experts chosen for specific tasks, for example, missile and chemical or biological weapons inspections. Helicopters were used to back up the inspections with aerial photography, videotaping, and real-time over-site visibility to keep ground inspectors informed on movements around the site in the event that material was being removed. In addition to the technical means provided by the helicopters, UNSCOM obtained the services of U.S.-operated U2 planes with high-altitude photography, which offered greater geographic coverage and an element of unpredictability not provided by the low-flying helicopters (even though the U2 flights were declared in advance). The U2 photographs provided highly revealing information on WMD installations and on the movement of suspicious objects before and after a visit by the inspectors.

A fourth layer of information came from satellite imaging, which offered a very wide visual field as well as greater unpredictability and secrecy. It was difficult for the Iraqis to know when a satellite would be flying over and thus when they should hide their movements. U.S. support and cooperation were essential for the U2 photography as well as the satellite information and, in fact, the Americans were the only ones willing and able to provide this backup. While the United States always flew the U2 missions, the planes were designated as UN property. UNSCOM was able to set the tasks for the overflights. The United States would hand over the prints and later the rolls of film to UNSCOM for analysis by their experts, a process in which Israeli intelligence was eventually included, leading to substantial benefit. Satellite imagery was extremely useful and could be downloaded at the Bahrain "Gateway" center run by the United States, the United Kingdom, and Australia. Distribution was strictly limited,however, to the executive chairman, team leaders, and U.S.staff members. The satellite photographs were held under U.S. control and could not be carried into Iraq by inspection teams. If UNSCOM saw something odd in a satellite or U2 photo, it could send helicopters in for a closer look. All this was unique to UNSCOM.

UNSCOM built on-site laboratories to test chemical and biological substances and other materials in a timely manner. Some materials were sent to a laboratory in Bahrain for analysis and to highly sophisticated laboratories in Russia, the United States, and elsewhere for more sensitive testing. UNSCOM became the preeminent source of expertise on Iraq. Because of their accumulated knowledge and experience, the experts in New York knew what to look for in the photos and what questions to ask observers and defectors. Iraq had created an extraordinary mechanism of concealment, and UNSCOM had to innovate constantly in order to ferret out Iraq's secret materials and programs.

The Significance of Intelligence

Under Resolution 687, Iraq was required to declare the location, types, and amounts of all chemical and biological weapons;all stocks of agents; all related subsystems and components;all research development, support, and manufacturing facilities;all ballistic missiles with a range greater than 150 kilometers and related parts, repair, and production facilities; and all of its nuclear capabilities. It was widely expected that Iraq would make the necessary declarations in good faith, in order to be free of onerous economic sanctions, and the inspection and destruction tasks of UNSCOM and the IAEA could be expeditiously accomplished. Nonetheless, Ambassador Rolf Ekeus, the first executive chairman of UNSCOM, very early recognized that the validity of Iraq's statements would need to be confirmed. As one of his first acts he sent inquiries to more than one hundred member-states asking for any information they might have relating to the presence of weapons of mass destruction in Iraq. UNSCOM was to have an ever-increasing need for such "information," as it became apparent that Iraq was intent on deception and concealment with the evident intent of preserving a WMD capacity. For UNSCOM's purposes,"information" quickly became indistinguishable from "intelligence."

In addition to the intelligence sources mentioned earlier, UNSCOM had access to electronic intercepts. The mass of information from all these sources was pieced together to provide the leads for the UNSCOM teams to follow in pursuit of their missions. The

UNSCOM operation entailed three broad tasks. The first, which was dominant during most of UNSCOM's history, was to search out hidden weapons, supplies, and equipment; to destroy what had not already been destroyed; and to compute on the basis of these findings and available intelligence what remained unaccounted for. The second and more controversial mission was through intrusive and carefully aimed incursions to identify the concealment mechanism used by Saddam Hussein and to prove that concealment and deception continued. The third mission was to establish a monitoring system that would permanently prevent Iraq from developing or acquiring weapons of mass destruction. When the Iraqi representative asserted in the Security Council that in repeated raids led by Scott Ritter, nothing incriminating had been found, he was correct. The purpose, however, had often been not to capture material but to force the hasty removal of telltale equipment, like rabbits from a lair, in order to observe, often by helicopter, what was removed and by whom. Another objective was to find out, if possible, how the Iraqis may have learned about the raid in advance.

The use of intelligence from every available source in pursuit of the mandates defined for UNSCOM and the IAEA in Resolution 687 was so patently justified that it was rarely subject to criticism in the United Nations (except by the Iraqis). Claims that UNSCOM was being used by governments, particularly the United States, to gather intelligence for their national purposes posed a far more serious problem and contributed ultimately to a loss of confidence in UNSCOM that the authors believe was unjustified. Yet it was also probably inevitable.

A number of questions need to be answered:

- Did some UNSCOM technical experts come from U.S. or other intelligence agencies? The answer is yes. The executive chairman needed trained technicians in relatively exotic fields. These experts were available only from countries such as the United States, Russia, France, Sweden, and the United Kingdom that were technically advanced in these fields and (unlike some) willing to admit it. Such experts had almost inevitably spent some time in one or another intelligence or defense agency, although their main employment may have been in universities or research institutes.

- Were such experts specifically placed in UNSCOM to spy for their governments? According to our research, the answer is, with very few possible exceptions, no.

- Did the executive chairman of UNSCOM carefully evaluate each technical expert supplied to him to determine whether he or she had ever had an intelligence background? The answer again is no. Ambassador Rolf Ekeus, to the extent possible, chose persons with whom he was personally acquainted, of which there were many because of his background in disarmament. But as the operation became larger and the technical requirements more complex, this became less and less possible. He accepted persons of proven technical capacity and expected they would be loyal to UNSCOM, regardless of previous associations, in accordance with the undertaking they made on reporting for duty.

w Did the experts working with UNSCOM, in the course of their duties, acquire information that was extraneous to the UNSCOM mandate but of substantial interest to national governments? The answer is obviously yes. If, as was the case, it was determined that Saddam Hussein's Republican Guard was central to Saddam Hussein's concealment mechanism, it was clearly desirable to know where the Guard was at any given time, who was in charge of specific missions, and where its headquarters were located. Such information could be valuable for purposes other than the discovery of weapons of mass destruction. So could the content and layout of the so-called presidential palaces, for example. So could such an obvious thing as the amount of destruction that resulted from the bombing in Desert Storm. Such information was not included in the reports that UNSCOM submitted to the Security Council. A number of UNSCOM staff have stated that it was reported back to national authorities of several countries as a matter of course. We do not doubt it.

w Did the United States seek to utilize UNSCOM to obtain information to assassinate Saddam Hussein? The authors have found nothing credible to substantiate the claim that the United States sought information from Americans or other nationals in UNSCOM to use in targeting Saddam Hussein or to undermine, in other ways, his regime.

w Were national governments able to gain information from communication intercept devices planted as part of the UNSCOM operation? The United States reportedly tried but without much success.

UNSCOM's Heritage

The UNSCOM-IAEA mission was limited to the elimination of Iraq's capability to maintain, produce, or acquire weapons of mass destruction. To an impressive extent, this mission was accomplished. A full account of weapons and materiel destroyed may be found in the UNSCOM report of January 29, 1999, a report of 234 pages (S/1999/94). The following summary list gives an idea of UNSCOM's impact:

w **Missiles:** 48 operational long-range missiles; 14 conventional missile warheads; 6 operational mobile launchers; 28 operational fixed launch pads; 32 fixed launch pads; 30 chemical warheads; a variety of assembled and nonassembled "super-gun" components.

w **Chemical weapons:** 38,537 filled and empty chemical munitions; 690 tons of chemical weapons agents; more than 3,000 tons of precursors chemicals; 426 pieces of chemical weapons production equipment; 91 pieces of related analytical instruments. Iraq was forced to admit that it had produced as much as 4 tons of the deadly VX, one of the most toxic chemical weapons, and had placed a still unknown quantity in delivery systems.

w **Biological weapons:** the entire main biological weapons production facility plus a variety of biological weapons production equipment and materials.

w **Nuclear weapons:** the IAEA has concluded that the military nuclear capability of Iraq has been eliminated.

This list does not take into account the large quantity of weapons and equipment that Iraq destroyed to prevent it from falling into UNSCOM hands. The UNSCOM-IAEA operation, in brief, has left Iraq a vastly weakened military power with, *for the present,* insufficient access to weapons of mass destruction to pose a threat to international security.

Despite these accomplishments, serious concerns remain. Iraq claims to have independently destroyed a specific number of its long-range missiles. Proof has not been found that all were eliminated. A number remain unaccounted for. In addition, Iraq is believed to retain several tons of VX and VX ingredients and a capacity to produce other forms of chemical and biological weapons. The permanent monitoring system that UNSCOM put largely in place to ensure that Iraq does not again embark on a WMD program became inoperative once UN inspectors were prevented from entering Iraq. Thus, this one aspect of the arms control provisions of Resolution 687 is not being met, which could pose grave dangers for the future.

Conclusion

As a UN operation, UNSCOM demonstrated that, under proper leadership, an international staff with advanced technical expertise can be assembled expeditiously and that a subordinate organization established by the Security Council (Article 29 of the UN Charter) can operate with a high degree of independence. The appointment of an executive chairman to head such a subordinate body can be highly instructive for future operations. Furthermore, UNSCOM demonstrated that to accomplish an agreed-on objective, member-states will provide sensitive intelligence material and that a UN organization can handle such material with full discretion.

There were prerequisites for UNSCOM's success. First and foremost, its necessarily intrusive operations could be carried out only in a country with severely limited capacity to resist. Equally important, there must be sufficient unanimity among the permanent members of the Security Council to obviate the exercise by any one of them of their veto right. In addition, there must be broad, if not total, support for the undertaking among the nonpermanent members. Finally, the operation must be under strong, skillful leadership. If any one of these prerequisites weakens, the operation will be prejudiced. This is what happened to UNSCOM. The permanent members of the council ultimately disagreed on the application of enforcement measures and on the methodology of inspections. Support among other members faltered, in part because of the adverse humanitarian effect of economic sanctions, in part because of suspicions that one or more states were using UNSCOM for national purposes, and in part because of the military actions by the United States and the United Kingdom in support of UNSCOM. A change in UNSCOM leadership engendered controversy within and outside the operation. Taking advantage of these circumstances, Iraq found means to resist completion of measures to which it had agreed in accepting Resolution 687.

It is doubtful whether the prerequisites that permitted the establishment of UNSCOM and its impressive accomplishments can be restored. The organization established to succeed UNSCOM has not been able to begin operations in Iraq. Yet while UNSCOM could not complete its mission and may never be duplicated, its organization, operational procedures, and the techniques and technical means of arms control that it developed will remain significant and can provide useful lessons when future circumstances require.

Part II: Regional Contexts to Nonproliferation

Six

Nuclear Command and Control in South Asia

Shaun Gregory is senior lecturer in peace studies at the University of Bradford in the United Kingdom. This project considers the state of command and control capabilities in South Asia in a comprehensive fashion, drawing on interviews in India and Pakistan with military, political, technical, and academic personnel and on other primary sources.

Nuclearization in South Asia and the Question of Stability

by
Shaun Gregory

The level of international attention focused on South Asia in the wake of the 1998 Indian and Pakistan nuclear weapons tests provides evidence that the risks of the use of nuclear weapons or even nuclear war are widely perceived to be genuine. Much international anxiety has crystallized around a perception of India and Pakistan and their respective nuclear programs that seems tailor-made to underline the distinctions between the acknowledged nuclear powers (the N-5 — the United States, Russia, China, the United Kingdom, and France) and the South Asian nuclear "upstarts." Loosely sketched, this perception is one of economically, politically, and technologically limited states struggling to come to terms with the novelty of managing nuclear weapons technology in the context of rhetorical hostility, a history of bilateral warfare, and a degree of political instability on both sides, overshadowed by the tinderbox of the ongoing territorial and sovereignty conflict in the contested region of Kashmir. India is characterized as increasingly assertive and casually indifferent to the security of its subcontinental neighbors; Pakistan as unstable and risk taking. When India and Pakistan are viewed in this way, it is difficult to see how a stable bilateral deterrent relationship can emerge and comparatively easy to conjure up a multitude of superficially plausible scenarios by which South Asia could descend rapidly into nuclear chaos.

In many important respects this analysis oversimplifies the situation, pays insufficient attention to balancing factors, and smuggles in a number of unfounded assumptions. Leaving aside such questions as whether either state ought to divert precious resources to nuclear weapons given the needs of their respective peoples or the implications of Indo-Pakistani proliferation for the Nuclear Nonproliferation Treaty (NPT), the point at issue here is whether a stable nuclear relationship can be constructed in South Asia.

Much of the answer to this question rests on whether robust command and control (C2) arrangements can be put into place to meet the requirements of stable deterrence. These are primarily assured high-level (preferably political) control of nuclear forces; the prevention of accidental, irrational, or unauthorized use of nuclear weapons; the assurance of nuclear

weapons operations to meet the requirements of strategy; and arrangements for escalation control and nuclear war termination. Research on this is scanty and there is little published material to draw on, although interest is clearly rising.

Evidence from the region suggests that these requirements can be met and that most are presently in the process of being met on both sides. This does not mean there are no risks, gaps, or potential instabilities, but it does suggest that the nuclear situation is more stable and the problems more subtle (though no less demanding) than the foregoing simplifications allow.

Evolution of India's and Pakistan's Nuclear Postures

The idea that India and Pakistan are new nuclear states is misleading. Both have had civil nuclear programs since the 1950s, India detonated a nuclear device in 1974, and both India and Pakistan weaponized their nuclear devices in the late 1980s. The tests in 1998 therefore represent an important step in the evolution of the bilateral nuclear relationship but not the geopolitical transformation some have argued. Consequently both parties have already managed a functional bilateral nuclear relationship for more than a decade and have steered this relationship through the crises of the 1990s, including the serious conventional conflict around the Kashmiri town of Kargil between May and July 1999 that began when two thousand Pakistani militants crossed the Line of Control into Indian territory.

Second, while hostile rhetoric reflects bilateral tensions and also serves national political purposes, it may contribute to deterrence through threat and ambiguity and undoubtedly draws international political attention. More important, it also masks the true degree of political and military realism in the respective national elites and obscures the extent of bilateral political and military dialogue in place (albeit suspended temporarily in the wake of Kargil).

Third, it is evident that in addition to direct technical assistance both India and Pakistan have benefited greatly from reflection on the experiences of the N-5 powers as they emerged as stable nuclear states in circumstances that in almost all respects were technically inferior to those of late-twentieth-century India and Pakistan. This reflection encompasses a rich understanding of nuclear deterrence, nuclear doctrine, strategy, posture, command and control arrangements and the role of arms control and confidence-building measures. It suggests that while India and Pakistan may not escape all the emergent nuclear problems encountered by the N-5, neither are they doomed to repeat them.

Last, and perhaps most significant, both states have shown considerable skill in fashioning a nuclear posture and command and control arrangements in line with the limits of their national conditions. With relatively few nuclear weapons in their respective nuclear arsenals, the two states have eschewed elaborate doctrine and strategy and premised deterrence on assured retaliation and counter-city targeting. India has openly declared a no-first-use policy of more than rhetorical value and, while Pakistan keeps this option open, both states have rejected nuclear war-fighting options as provocative, escalatory, and beyond their deterrence needs.

The simplification of their nuclear postures in this manner has greatly reduced the demands on Indian and Pakistani command and control arrangements. Both states, facing thematic challenges similar to those of the N-5, are developing American-style hierarchical

C2 systems (though minus the political element in Pakistan's case). However, given that there is no need for the complex targeting and precise escalation control of, for example, NATO's flexible response; given that missile flight times to city targets are a matter of six minutes or less; and given that assured retaliation is underwritten in the medium term by dispersal, decoys, and redundant communication systems, many of the more demanding C2 challenges such as strategic and tactical warning, maintaining high levels of alert, and provisions for launch-on-warning or launch-under-attack are peripheral or simply irrelevant. Moreover, in these circumstances key C2 requirements such as the imposition of high-level control can be addressed by relatively low-tech procedural means such as the two-person rule (reinforced by command authority separation) and the expedient of keeping warheads and delivery systems separated until required.

Such measures also address many of the anxieties about accidental, irrational, and unauthorized use, relying, as does the United Kingdom, on the integrity and obedience of officers, the separation of procedures, checks to control those with access to nuclear weapons, and the requirement for the collaboration of multiple individuals to carry out nuclear activities. The oft-repeated regional demand for N-5 assistance with permissive action link or PAL-type technology to strengthen high-level control trades on international anxiety and derives largely from the legitimacy that would be transferred to India and Pakistan with such technology (assuming a way around the NPT could be found) rather than from a pressing technical need. Meeting the operational requirements of nuclear first-use makes few rigorous demands on command and control, nor does measured retaliation, since neither side can be confident of decapitating or even significantly degrading the other's nuclear infrastructure.

The Dynamics of Escalation

The claim that Kashmir or a crisis like Kargil could provide the spark for the use of nuclear weapons or even nuclear war is usually premised on many easy assumptions about the dynamics of escalation from a low-level conflict to a cross-border war and from a cross-border war to crossing the nuclear threshold. In fact the history of conflicts between India and Pakistan shows a high degree of intrawar escalation control, a repeated propensity to bilateral political and military dialogue to contain conflict, and an aversion to systematically attacking civilian targets (which both Indians and Pakistanis contrast with Western practice evidenced from Guernica in the 1930s via Dresden, Hiroshima, and Vietnam to Serbia in 1999). In the nuclearized context since the late 1980s the evidence suggests greater caution still in containing conflicts at the lower levels, a point often overlooked when Kargil is presented as evidence that nuclear weapons do not constrain conventional conflict.

At least three other factors have to be added to this analysis: (1) the notion that the assured mutual destruction of cities (in Pakistan there are but three targets: Islamabad/Rawalpindi, Lahore, and Karachi) is a powerful deterrent against nuclear risk taking; (2) the demographic realities that partition in 1947 divided families and peoples, and that there are more Muslims in India than in Pakistan, with all that this implies about the threat of either to the population of the other; and (3) the sentiment, widely expressed in the region, that a serious war with even a whiff of serious nuclear risk would bring the international community and particularly the United States swiftly into the situation. This third factor indeed may

be a core element of Pakistan's nuclear policy (much as it was of South Africa's in the 1980s), and may help to explain its refusal to rule out first-use.

This analysis does not mean that there is no risk of nuclear use or nuclear war in South Asia or that there is no risk of escalation from the conventional to the nuclear level. It does, however, suggest that research and the promotion of bilateral dialogue and stability in the region should seek to avoid the assumptions and simplifications that obscure many of the region's real nuclear uncertainties. From this project's preliminary work in the region there appear to be at least six issues that neither overstate the problems nor understate the risks.

1. **Bilateral perceptions.** A clear obstacle to achieving a stable nuclear relationship is the polarized perception of the other evident in each state. For India, the locus of nuclear risk lies in the Pakistani military. It is seen as undemocratic and thus unaccountable politically for its actions and insulated in important respects from the wider, and by implication more level-headed, elite discourse in Pakistan. It is seen also as risk taking in supporting Kashmir separatism and regional "terrorism" and in its past history of going to war with India despite the preponderance of Indian military power. The threat for India is thus that the Pakistani military may initiate an overambitious conventional conflict that it subsequently feels it has to defend by nuclear means.

   For Pakistan, the locus of nuclear risk lies in an increasingly hard-line and assertive India confident of growing U.S. support (not least in relation to China and the Muslim world) and thus prepared to exercise conventional and nuclear pressure on its neighbors in a process of regional "Finlandization." As the underlying fundamentals favor India, and as India's nuclear weapons program is less threatened by international sanctions than that of Pakistan, the fear of the latter is that it may be subject to conventional and nuclear blackmail and thus forced to defend its vital interests to the point of a nuclear exchange.

   The core issue here is that these perspectives point up the polarization of bilateral perceptions and thus provide insight into the rigidity of the respective internal debates that make creative thinking difficult and the implementation of novel ideas even harder.

2. **Perceptions of risk.** A related issue is that at present there appear to be only limited regional perceptions of the shared bilateral risks of nuclear war (notwithstanding some relevant bilateral agreements and elements of the presently suspended Lahore Declaration) and thus little recognition of the need to recalibrate other national strategic priorities—national defense and Kashmir in particular—in relation to the overriding strategic imperative of avoiding nuclear war. The issue is complicated further by the asymmetry between Pakistan's preoccupation with India in its security thinking and India's focus on a range of security questions, of which Pakistan is but one.

3. **Command and control challenges.** Despite learning from the experience of the N-5, both India and Pakistan still face the technical challenges of developing, deploying, and maintaining a robust nuclear command and control system in a novel environment. Such challenges include the costs of paying for adequate systems, phasing in the systems without creating instabilities or vulnerabilities, handling transitional failures and malfunctions before systems become reliably operational in situ, and system

implementation in the context of a degree of infrastructure fragility evidenced, for example, in both countries' intermittently functioning power and telecommunications systems.

4. **Civil-military relations.** A further tension between India and Pakistan is the opposing challenges each faces in moving toward an appropriate civil-military balance in the management of nuclear forces. For Pakistan the task in the context of the military dominance of nuclear weapons is one of "civilianization," that is, bringing political elements into nuclear decision making and implementation in a manner that properly reflects the public good and the will of the people. For India, the task is effectively the reverse: to "militarize" a nuclear posture that at present is dominated by the government and civil organizations to ensure that the military is fully integrated in nuclear decision making and fully functional operationally.

5. **Dyadic coupling.** There appears as yet to be little acceptance of the idea that in a conflictual context the nuclear weapons of two protagonists become in certain respects coupled with one another, not least through the interaction of their respective command and control systems. Consequently it is appropriate in relation to some issues to conceptualize the situation not as two national systems but as one coupled dyadic system. The acceptance of this idea has important implications for national systems and bilateral dialogue and management, while its neglect carries risks of unexpected and potentially destabilizing interaction.

6. **Escalation control.** Notwithstanding the arguments against rapid or inevitable escalation to the nuclear level in the event of conventional conflict, there remain escalation issues around the performance and vulnerability of command and control systems in the context of a serious conventional conflict as the control-readiness trade-off shifts toward the possibility of nuclear use. One important point is the risk that the deployment of nuclear weapons and the command and control systems to support them may erode the "distance" between low-level conflict and the possibility of nuclear use (such an erosion could occur, for example, if lucrative nuclear targets—such as storage facilities or critical C2 nodes—were vulnerable to preemptive conventional or nuclear strike). A second point is an evident lack of regional attention to de-escalation and war termination, both of which require preplanning and bilateral provisions if there is to be any confidence in their efficacy during a conflict or following nuclear use.

In sum, these issues add up to a formidable challenge for India and Pakistan, and for the international community hamstrung by the provisions of the NPT and by the need to avoid being seen to legitimize nuclear proliferation. Such issues nevertheless demand urgent attention. Many regional commentators on both sides now see a confluence of factors—including the release of Kashmiri leaders following the Air India hijacking around whom a more concerted push for Kashmiri independence may coalesce, a growing instability in Pakistan as the military government struggles to meet the country's economic and political needs, and a hardening of the Indian attitude in seeking, in the wake of Kargil, to impose higher costs on Pakistan for "adventurism"—posing the real risk of a dangerous confrontation between India and Pakistan in the near term.

Iran and Nuclear Weapons

The Road Ahead

Geoffrey Kemp is the director of the Regional Strategic Program at the Nixon Center. This project examines Iran's putative nuclear weapons program and the approaches to encouraging Iran's adherence to the provisions of the Nuclear Nonproliferation Treaty. The project taps into the Nixon Center's ongoing studies on U.S.-Iranian relations, which are establishing wide-ranging contacts with senior Iranians who support unofficial talks with the United States.

Iran's Nuclear Ambitions

It is widely accepted in most circles in the U.S. government and the analytic community that the Islamic Republic of Iran is supporting a number of programs, some overt, some covert, that will provide it with the option of developing and deploying a nuclear weapons capability. Concern about Iran's nuclear programs can be broken down into three components: the civilian research and power reactors that are operating, being built, or planned; efforts by Iran to clandestinely develop a centrifuge uranium enrichment program and possibly a facility for plutonium separation (reprocessing); and attempts by Iranian agents to illegally purchase fissile material and dual-use items that can be used for nuclear weapons development from foreign sources, primarily, but not exclusively, in Europe and the former Soviet Union.[1] The debate about Iran's nuclear weapons also relates to Iran's political-military intentions and the scope, magnitude, timing, financial cost, and strategic benefits and liabilities of a nuclear program.

A decision by Iran to procure and deploy nuclear weapons would have far-reaching and unsettling consequences for the security and stability of the greater Middle East. Its impact would be felt far beyond the Persian Gulf and would influence events in the Eastern Mediterranean, the Caucasus, and South and Central Asia. In extremis, fears that Iran will introduce nuclear weapons into its arsenal could lead to preemptive military action by countries such as Israel or even the United States. Iranian nuclear weapons mounted on medium-range surface-to-surface missiles would have much greater significance than the deployment of chemical or biological weapons because of their proven strategic value. Therefore, how to prevent an Iranian nuclear weapons program must be a high priority for the United States. Whether this objective is attainable and, if so, whether it is best achieved by conciliatory or confrontational policy or a mixture of both are important factors in the debate about U.S. policy toward Iran.

There are several realities that must be acknowledged when reviewing Iran's nuclear weapons options. First, without access to highly classified intelligence data, there are limits

by
Geoffrey Kemp

to how far analysts can speculate about the precise nature of Iran's activity. Second, there is an increasingly vigorous debate in the Iranian press and among Iranian policy analysts concerning the wisdom of Iran's current posture on nuclear weapons. Third, the substance of the debate is primarily about how nuclear weapons relate to the vicissitudes of Iranian foreign policy rather than to technical or military issues. Fourth, there is little public discussion in Iran concerning a number of reports and statements in the West stating that the Islamic Republic has initiated a number of covert initiatives to procure technology that has direct utility in the construction of a nuclear weapons device.

Iran's proclivity to consider a nuclear weapons option has been present since the 1960s when the pro-American regime of the shah had great expectations for Iran's role in the region and the world. However, it was the bloody war with Iraq from 1980 to 1988, including Iraq's use of chemical weapons and Iran's sense of isolation from the world community, that gave rise to the most intense discussions within the regime on the merits of a nuclear capability. The nuclear tests conducted in May 1998 by India and Pakistan have reinforced the arguments of those in Iran who consider nuclear weapons to be an essential ingredient for national defense. Furthermore, the existence of Israel's nuclear capability and long-range missiles adds to Iran's sense of vulnerability.

However, Iran faces major constraints if it wishes to follow in the steps of India and Pakistan or even Israel. Unlike these three countries, Iran is a state party to the Nuclear Nonproliferation Treaty (NPT) and, as such, is subject to International Atomic Energy Agency (IAEA) inspections of its existing nuclear facilities that are presently geared toward research but will include a major nuclear power reactor at Büshehr once its construction is completed. Any gross violation of its NPT agreements could trigger international sanctions, including an oil embargo—an event that would have devastating implications for the Iranian economy, which is already suffering from mismanagement, corruption, inflation, and unemployment. Legally, Iran could withdraw from the NPT after giving three months' notice and proceed with a program. However, once Iran had announced its intentions to withdraw from the treaty, it would be vulnerable to a number of punitive preemptive actions, including military force. Yet given the dangerous neighborhood Iran finds itself in—one that features tensions with Afghanistan, the continuing regime of Saddam Hussein in Iraq, and a hostile U.S. fleet deployed in the Persian Gulf and adjacent waters—prudent observers should assume that there are circumstances in which Iran would be prepared to pay the price necessary for what it perceives to be a vital national security interest.

Impact of an Iranian Withdrawal from the NPT

In anticipating the conditions of an Iranian withdrawal from the NPT as well as the costs and the benefits that might compel an Iranian regime to do so, we must distinguish between those conditions that may seem justified according to strategic logic and those that may be more related to Iran's sense of importance, its desire for international status, and its wish "to be taken seriously." How the external world, including Iran's regional neighbors, would react to an Iranian withdrawal would be significantly influenced by the state of relations between Iran and the rest of the world at the time such a decision was made. For instance, could it be argued that it would be easier for Iran's neighbors to accept an

overt nuclear force developed by a cooperative nationalist Iranian regime for prestige purposes than a force developed by a militant regime in the face of serious strategic threats? In this context, it is instructive to view the international responses to evidence that Iraq, North Korea, India, Pakistan, and Israel were developing nuclear weapons. The extremely hostile reaction to Iraq's and North Korea's behavior can be explained only in part by the fact that they violated their NPT commitments. The reaction was also conditioned by the belligerent behavior of these two regimes and the genuine fear that either regime was capable of using nuclear weapons against one or more of its neighbors.

A rather different international reaction has accompanied evidence that Israel, India, and Pakistan are nuclear powers. Although Israel has never formally acknowledged its nuclear capability, it has been known for many years that the country has the bomb, though there has been a debate about how many devices it possesses and where they are deployed, as well as their means of delivery. Nevertheless, although the Israeli bomb causes great political anxiety in several Arab capitals, notably Cairo, and is perhaps cause for genuine concern in Baghdad and Tehran, the rest of the world has been unprepared to sanction Israel in view of its security problems and the unresolved Arab-Israeli conflict.

There has been a more visceral and proactive reaction to the Indian and Pakistani bombs, but less than would have been anticipated a decade ago. When both countries detonated nuclear devices in May 1998, the law demanded that the United States and Japan apply sanctions, but this was seen in retrospect to be overly penalizing Pakistan, which is less able to withstand the impact. Furthermore, the sanctions removed much of the United States' bargaining power with Pakistan. It would have to be said that today, while there is great concern about the stability of the subcontinent, there is no desire or will to impose global sanctions on either country and this attitude is unlikely to change soon.

Given these examples, into which category would Iran fall? Had the Iranians announced a nuclear weapon at the height of the war with Iraq and the crisis with the United States when Ayatollah Khomeini was still talking about exporting revolution, the international response might have been extremely punitive even if Iran had announced its formal withdrawal from the NPT. In contrast, if the forces of moderation continue to gain more power in Tehran and show that they are willing to be cooperative with the West and to resolve their outstanding differences with the United States over terrorism and the Arab-Israeli peace process, then indeed it may be easier to tolerate some form of nuclearization of Iran, particularly if other aspects of the relationship are going well.

If Iran were to succeed in deploying nuclear weapons and was able to avoid preemptive attacks and sanctions, the geopolitical balance in the region would change. While there *could* be circumstances in which an Iranian nuclear weapons capability would not be destabilizing to the neighborhood—the emergence of a new moderate regime or the consolidation of power under the current president, Mohammad Khatami, would be positive steps in this direction—the downsides of a nuclear deployment are so serious that it is necessary to consider a range of options designed to deter Iran from moving in this direction.

Iran's Arms Control Considerations

Iran's putative weapons programs must be examined within the context of broader universal and regional arms control considerations. At the diplomatic level, Iran considers itself a leader of the Third World and argues that it is inherently unfair that countries in compliance with the NPT, that is, signatory countries that are regularly inspected by the IAEA and found to be fully in compliance, be denied civilian nuclear technology since this is explicitly permitted under Article IV of the NPT. Iran, however, has been systematically denied this by most of the suppliers, including China and, in some areas, Russia. There is an inherent contradiction in the language of the NPT and the unilateral actions taken by the nuclear supplier group to limit transfers. This has become a North-South issue with Iran leading the argument, as India has done for many years, that the northern countries are trying to deny technology to the southern countries.

Compounding Iranian anger over treatment on the nuclear issue is the so-called double standard that the United States applies. The United States reached an agreement with North Korea to provide it with light-water reactors in exchange for giving up its nuclear capabilities that could contribute to the manufacturing of nuclear weapons; however, the United States refuses to consider a similar deal for Iran. Most blatant, from the Iranian point of view, is the refusal of the United States to acknowledge or say anything about Israel's nuclear weapons program in view of the fact that it is universally accepted that Israel has nuclear weapons and Israel is not a signatory of the NPT.

Russia's importance to Iran is underlined by not only the former's supply of the latter's critical ingredients for its nuclear and missile program, but also the sale of advanced conventional weapons, including submarines and ship-borne surface-to-surface missiles. Russia and Iran also share common strategic interests in the Caspian region, especially at a time when it is U.S. policy to deny Iran access routes for energy pipelines through its territory and to marginalize Russia's ability to market Caspian energy. Nevertheless, over time there will be potential conflicts of interest between Russia and Iran. Since both countries are natural egress routes for Caspian Basin oil and gas, if Iran and the United States were to repair their relationship and Iran were permitted to become a key egress route, it would run into direct competition with Russia. Similarly, a buildup in Iranian military capabilities, particularly if it were to involve long-range missiles and weapons of mass destruction, could eventually pose a threat to Russia.

Hence, the question arises, why is Russia helping Iran in its military acquisitions? The answer is to be found in the confused and conflicting state of affairs in Moscow. As with other foreign policy issues, including relations with China, Russian policies seem to contradict one another. The Foreign Ministry and the Ministry of Defense are often at odds with aggressive lobbies pushing for arms sales and technology transfers. Russia's huge oil and gas companies (Lukoil and Gazprom) have great clout in Moscow and in many ways operate their own foreign policies. This issue comes up frequently in the context of individual Russians and small Russian companies that have been aiding Iran in the development of its missile program. On each occasion, when approached by U.S. officials, the Russians deny that there is any formal government policy in favor of such help; this would be a violation of the Missile Technology Control Regime (MTCR), which Russia has signed. However, since the Iranians want to build this missile systematically and are not in

a hurry, they will undoubtedly continue the program with or without Russian support. Understanding the Russian perspective on Iran remains a crucial component of any overall strategy of the Iranian nuclear weapons program.

Taking Iran's Security Needs Seriously

To consider practical steps that can be taken to help convince Iran that its adherence to the NPT remains in its interest means taking into account Iran's legitimate security needs, including its fears about U.S., Israeli, and Iraqi military potential; its sense of grievances over attempts to limit its development of nuclear power infrastructure for peaceful purposes; and its long-standing objections to the so-called double standard applied to its membership in the NPT.

Iran's regional threat perceptions are likely to continue no matter who is in power in Tehran. Today Iran's security is primarily focused on a defensive strategy—unlike in the early days of the revolution, when Khomeini talked about overrunning the Arabian peninsula and toppling the corrupt monarchs. Iran must deal with unrest and civil war in several of its neighboring states, most seriously in Afghanistan. Iraq is in danger of being fragmented, and until recently Iraqi Kurds operated in an autonomous safe haven in northern Iraq. The Caucasus is also a hotbed of civil strife, with the Armenian and Azerbaijan war over Nagorno-Karabakh, the conflict in Georgia over Abkhazia, and Russia's struggles within its own southern regions. Farther to the east, Iran has become diplomatically caught up in the chaos and fighting in Tajikistan, the one Central Asian country whose population is predominantly Persian speaking and of Shiite faith.

The region clearly contains numerous unresolved conflicts that have important military dimensions and are likely to encourage the further proliferation of weapons of mass destruction and their delivery systems. In view of the increased range and accuracy of the latter, the interregional linkages between theaters of conflict are becoming more apparent. For instance, longer-range missiles deployed in Israel and Saudi Arabia and possibly soon to be deployed in India and Iran extend each country's strategic reach far beyond its immediate neighborhood.

Iran has argued that in view of its experience with missile attacks during the Iran-Iraq war and the reality that many states around its borders deploy missiles and long-range strike aircraft, Iran naturally would want a similar capability. Unable to afford the most expensive long-range strike aircraft (and unable to buy Western models), Iran gets a modicum of deterrence from surface-to-surface missiles, whether armed with conventional or unconventional warheads. Since there is presently no assured defense against missile attacks even in the battlefield, such weapons also pose a threat to U.S. and allied forces based in the Persian Gulf.

Iran's conventional force structure suffers from significant weaknesses and is hampered by a lack of financial resources. Therefore, it is likely to pursue what has been called a "niche strategy." For instance, by procuring kilo-class submarines from the Russians and purchasing cruise missiles from China, the Iranian Navy has gained the attention of the U.S. Navy in the Persian Gulf. Iran is capable of using its maritime power to challenge the United States in the Gulf, rather than defeat it. Iran is also developing the capability to disrupt the Gulf with mines and shore-based missiles. According to U.S. Central Command

(CENTCOM) analysts, Iran has been getting "stealthier" in its mining capability and can use submarines as mobile mining devices for deep-water mining. However, since Iran's own oil exports must go to international market through the Strait of Hormuz, it is unlikely that Iran would ever attempt to close down the strait except in a dire emergency. Iran is more interested in the ability to control the strait.

Iran's Likely Strategy

Against this backdrop of insecurity Iran will most likely continue to pursue a nuclear insurance strategy. In other words, it will seek to develop the infrastructure and personnel to permit it to develop weapons-grade material if and when "extraordinary events" convince it that it has no option but to develop the bomb. Of course, how its leaders would decide to define or interpret "extraordinary events" is a key question. Would the desire to have the bomb outweigh the huge costs they would have to pay if they formally withdrew from the NPT? There is no doubt that a "legal" Iranian nuclear weapons program would be almost as serious as an "illegal" program and the pressure for sanctions equally harsh, though not as binding.

Because a decision by Iran to proceed with a major nuclear weapons program would put great strains on the Iranian economy and its relations with neighbors and the international community, it would probably be made only under the most dire circumstances. What could these circumstances be? Several are possible, listed in likely order of importance:

- the reemergence of a nuclear-armed Iraq free from international sanctions and UN weapons inspections;

- a sharp deterioration in relations with the United States and Israel accompanied by reciprocal and escalating military threats and rhetoric;

- a crisis with a nuclear-armed Pakistan triggered by conflict over Afghanistan or Sunni-Shiite rivalry;

- a new, belligerent, and anti-Iranian regime in Saudi Arabia;

- a prolonged crisis with Azerbaijan and Turkey over minority and energy-related issues; and

- a possible crisis with a more nationalist, anti-Islamic leadership in Moscow.

It is also necessary to consider some of Iran's alternative choices for implementing a nuclear weapons program:

- an announcement that Iran *might consider withdrawing* from the NPT if its security needs are ignored;

- an announcement that Iran would formally withdraw from the NPT after the prerequisite three-month waiting period and would then *consider* whether or not to proceed with a nuclear weapons program;

- an announcement that Iran would withdraw from the NPT in three months and *proceed* to deploy a nuclear weapons program;

w an ambiguous deployment of nuclear weapons, neither confirmed nor denied—equivalent to Israel's opaque nuclear weapons policy; and

w a surprise nuclear test, paralleled by a statement that Iran possessed a small arsenal of warheads and missiles.

Conclusion

A review of Iran's nuclear options suggests a number of preliminary conclusions:

w The political, economic, and strategic costs to Iran of violating its NPT commitments or formally withdrawing from the treaty could be considerable. *This would be a clear red line.* Absent a real and present danger from an adversary such as Iraq, the Iranian leadership would need to think long and hard about the risks of such a venture. This suggests that the most prudent policy would be to continue to develop the infrastructure for a weapons capability but to avoid crossing the red line in the hope that a more stable regional security environment emerges.

w If, nevertheless, Iran were to cross the red line it would then need to weigh carefully the costs and benefits of developing alternative forces. A small force will be easier and cheaper to develop than a medium-size force, but its utility against major adversaries would be more questionable. On the other hand, if the primary purpose of the force is status, it might suffice.

w Perhaps the more important variable in the equation is the nature of the Iranian regime. A moderate regime that has repaired relations with the United States would be more likely to be part of regional security discussions and might be less in need of a nuclear force. A hard-line regime, antagonistic to the United States and Israel, would likely continue to be isolated and feel a greater need for a deterrent. Yet the risks of countermeasures against the regime would be much greater were it to undertake such a project.

w A political rapprochement between the United States and Iran would probably provide a breathing space for any regime in Tehran to reevaluate the benefits of exercising a nuclear weapons option. Clearly, its decision on this issue would be influenced by improvements in the regional security environment and Iran's inclusion in Caspian energy projects.

Note

1. These issues are covered in great detail in Rodney W. Jones et al., *Tracking Nuclear Proliferation: A Guide in Maps and Charts, 1988* (Washington, D.C.: Carnegie Endowment for International Peace, 1998), 169–182.

Nuclear and Missile Export Controls in Russia

Policies and Practices

Vladimir A. Orlov is the founder and director of the Center for Policy Studies in Russia (PIR Center), based in Moscow. An independent, nonprofit institution founded in 1994, the PIR Center is considered by many to be the leading nongovernmental organization working on arms control and nonproliferation in Russia. The purpose of this project is, first, to describe Russia's declaratory export controls policies (particularly in the areas of nuclear and missile exports but also in other areas related to sensitive transfers of materials and technologies); second, to identify gaps between the policies and export controls practices; and third, to prepare policy recommendations on how to narrow this gap.

Implementation of Controls in a New Market Economy

by
Vladimir A.
Orlov

Since the early 1990s, export control problems have increasingly become one of the key issues in U.S.-Russian relations and have frequently surfaced during bilateral dialogue between Russia and a number of other developed countries. Beginning in the mid-1990s, issues related to export control violations have also appeared in the lists of domestic security concerns of the Russian political leadership. After the breakup of the Soviet Union in late 1991, Russia had to establish a new export control system, involving legislation, licensing procedures, customs regulations, law enforcement, and interagency coordination.

A combination of factors has led to an inevitable gap between the legislation and declaratory policy, on the one hand, and the actual implementation of export controls, on the other hand. In the transition from a command and control system to a market economy, the market has been understood by many as allowing the freedom to make money regardless of laws and, in particular, to export without any limits. Within this context there are export pressures from a large nuclear, chemical, biological, and missile industry that traditionally focused on defense and faced, in the 1990s, a profound crisis. A lack of will by the political leadership to enforce the legislation and to impose interagency coordination has compounded the problem, while other officials have been corrupted by criminalization of the society and of the economy (including the military-industrial sector). Weak enforcement of the law, shortages of technical equipment, and lack of a nonproliferation culture at most enterprises have also contributed to the gap between policy and practice.

Russian Declaratory Export Control Policy

Based on the study of many Russian political documents, we believe Russia's stated policy in the nonproliferation area lacks coherence. However, the Russian leadership generally proceeds from the assumption that Russia, as a nuclear weapon state (NWS), has a vital interest in contributing to a strong nuclear nonproliferation regime. Russia especially does not welcome the emergence of new states with modern long-range delivery systems, given the proximity of likely proliferators to Russia's borders.

On the one hand, a nuclear nonproliferation policy can hardly be called a Russian political priority. On the other hand, Russian politicians, military leaders, and diplomats strongly believe that circumvention of the international nuclear nonproliferation regime is dangerous for Russia. It will not only undermine Russia's prestige and cause more tension with the United States, but also set free a dangerous genie. It will be more difficult to rebottle this genie, and one day it may hit Russia from the territory of Iran or North Korea. Russian thinking is influenced by a "China syndrome"; Soviet assistance to China in developing the A-bomb enabled the latter to accomplish this task ten to fifteen years earlier than would have been possible with a purely indigenous program.

Among the political and military elite as well as among export-oriented ministries and state-owned companies, there are people who insist that Russian export policy should go beyond purely economic motives to advance a number of foreign policy missions. Along this line of reasoning, the primary task would be to preserve or to revive Russia's influence in vacuum zones—such as Iraq, Iran, Syria, North Korea, Sudan, and Cuba—by transferring sensitive materials and technology specified by international trigger lists. This reasoning could account for Russia's relationship with India and China as a means of complicating the U.S. foreign policy environment. This influential minority tries, though mostly unsuccessfully, to get Russia to use nonproliferation to pursue its "Cold Peace" confrontation with the United States. Overall, then, the majority remains supportive of export controls as a nonproliferation tool but is also suspicious of U.S. motives for emphasizing that issue.

The key document for national export controls is now the Law on Export Controls (which became effective in July 1999). The important elements of the Russian export controls established by this law are as follows.

w For the first time, a definition of "export controls" has been established and approved. This definition covers materials, information, works, services, and results of intellectual activities that may be used for WMD production, means of their delivery, and other types of arms and military equipment.

w The law declares the goals of export controls as (1) protection of Russian Federation interests; (2) compliance with international treaties signed by Russia in the area of nonproliferation and export controls; and (3) creation of conditions for integrating the Russian economy into the world economy.

w The export controls lists are signed by the president and should be developed with the joint participation of parliamentarians, industrialists, and research institutes.

w The law pays special attention to controlling the export of intellectual products, technology, and dual-use materials.

w Sanctions against companies and individuals that violate the export control rules are introduced.

w The law calls for harmonization of Russian export control lists and procedures with internationally recognized norms.

w Transparency of information on export controls and easy access to it are declared as a "principle of state policy of export controls."

w Establishment of an internal compliance program at Russian companies involved in production or research and development (R&D) in the defense area and having regular export operations is declared obligatory. State licensing of companies with established internal compliance programs is introduced.

w The law establishes a detailed plan of action against companies suspected of violating the export controls legislation, including financial auditing, any necessary checks of documentation, and so on.

w A catchall principle is established for the first time in primary Russian legislation.

Although it is clearly an important step forward, the Law on Export Controls should not be viewed as a critical success. The road to preventing export control violations is too long in Russia to expect that improvements will bear fruit overnight or even in a few months.

The question of whether the law will work or will be only a piece of paper is not an easy one to answer. On the one hand, even some U.S. diplomats who have traditionally been critical of Russian export controls have recognized that in a short period of time considerable success has been achieved by Russia in improving export control practices. On the other hand, a number of existing internal problems, which, practically speaking, cannot be solved in a short period of time but only in years, make any optimistic forecast premature.

The key problems include poor interagency coordination, government corruption and penetration by export interests, financial and technical problems, lack of an export control culture, weak punishment of violations, and loopholes created by regional factors.

Risks of Proliferation from Sensitive Russian Exports

We should recognize that some states continue to seek Russian materials and technology that can be used to create WMD or their delivery systems. We can also presume that the international criminal community and terrorist groups are interested in exploiting flaws in Russia's export control system in order to acquire sensitive materials and technology.

For the most part, the problem is not missile material export control violations. The problem of illicit export of fissile materials does endure, but it should be qualified as "very high risk, very low probability." The export of missile components remains more significant, but it should be categorized as "very high probability, relatively low risk." Materials should not be the primary concern anyway. The threat of unauthorized export of dual-use technology (particularly, biotechnology that can be used in development of biological

weapons),scientific knowledge, and bearers of this knowledge (scientists and engineers) should be considered much more grave.

The countries that display the greatest interest in sensitive Russian materials and technology are China, Iran, Iraq, India, North Korea, Syria, and South Korea. Russia's relationship with each of these states varies. China is a nuclear weapon state,and,therefore,its construction of a centrifuge plant for uranium enrichment raises no concerns about the violation of the nonproliferation regime. At the same time,leakage of some Russian dual-use technology to China would be a serious blow to Russian national security and to the international system of export control on the whole.

As for contacts with Iraq, Russia has imposed an embargo on the shipment of sensitive materials to this country. That said, we have already witnessed serious Iraqi initiatives to gain access to Russian missile equipment components, corresponding technology, and perhaps biotechnology. In our opinion, the building of the Russian nuclear power station in Büshehr, Iran, does not violate export control regulations. On the contrary, it meets the requirements of Article IV of the Nuclear Nonproliferation Treaty (NPT), which calls for assisting the development of peaceful nuclear technologies. At the same time, Iran's striving to acquire Russian missile technology to develop its ambitious missile program has become a serious problem in recent years.

Russian cooperation with India in the nuclear field is dubious from the legal standpoint, and it runs counter to the practice of strengthening the nonproliferation regime, because India is not an NPT signatory. One issue is the nuclear power station construction in Kudamkulam. A second issue is Russia's intention to supply India with nuclear-powered submarines (although this is not an illegal breach of international commitments or Russian national legislation).

The active involvement of "rogue state" secret services stands as a serious problem, because such agencies possess sophisticated methods of procuring secret technology and materials from defense industries and usually share this technology. For instance, for a few years, Iranian secret services were active in finding ways to purchase strategic components for the Iranian missile program at Russian enterprises. Such activities were finally prevented by the Russians and subsequently made public. The so-called missile chain proliferation has also become very intensive: for example, missile components, technologies, scientific information, and scientists and engineers themselves are being transferred from North Korea to Libya, and then to Syria, or from North Korea to Iran via Pakistan.

According to PIR Center's estimates, the problem of export control violation through illegal transfer of equipment remains the most serious.[1] U.S.assistance to Russia's State Customs Committee (GTK), which establishes the "second line of defense" for nuclear materials in Russia channeled through the Nunn-Lugar Program, is critical for minimizing the risk of smuggling sensitive materials from Russia to rogue states and to nonstate actors such as major international terrorist groups or the international organized criminal community.

Conclusion

A Russian export control system and national export control regime presently exist, so that Russia now has a full-scope legal basis for regulating export control issues. The Law on

Export Controls logically completed the process of creating such a legal basis. Thus, the most alarming matter is not the legal basis for or declaratory intent of the Russian export control policy, but its practical implementation. If we take into consideration the many problems connected to implementation, it would be naive or irresponsible to say that current legal documents can by themselves prevent the illegal transfer of goods and technology from Russia. Moreover, the foremost problems are leaks of knowledge and the brain drain.

However, it is possible to improve implementation. In particular, it is necessary to establish in Russia a multiphase system of punishment for export control violations as soon as possible. The sequence, warnings–fines–administrative sanctions–criminal prosecution, declared by the Law on Export Controls must be put into practice. The prosecutor's General Office and its subordinate units should conduct appropriate investigations and make their results known to the public.

Bringing practical export control policy into conformity with national legislation would enable Russia to accomplish its foreign policy tasks, and working to make export controls more effective both domestically and internationally would contribute directly to Russian national security while removing a contentious issue from its diplomatic relations with other key countries.

One cannot rule out the possibility that President Vladimir Putin's "pragmatic" approach to Russian foreign policy may in the future mean greater willingness to develop nuclear cooperation, even if there is a danger of violating or not complying fully with international commitments. However, such cooperation would be undertaken only with those states that are regarded as Russia's long-term strategic partners (e.g., India), not with those seen as potential sources of threats to Russian security.

Note

1. In the framework of the project, PIR Center staff managed to examine in detail the mechanism of illicit export of missile components from Russia to Iraq (1993–95). To summarize, a Russian defense and conversion enterprise known as NIIKhSM and located in Sergiev Posad (Moscow region) founded a dummy company (SPM-Sistema) in 1994 and signed a contract with an Iraqi representative, Wi'am Gharbiya. The deal concerned the shipment of strategic gyroscopes—a key element of guidance systems for Iraqi missiles and much desired by the regime of Saddam Hussein. To deal with the customs problems, the partners chose a Nigerian-led firm, Nisov Pie, incorporated in Moscow. It succeeded in passing all customs barriers (calling the commodity some kind of "electronic equipment"), and the gyroscopes successfully left Moscow Sheremetyevo-2 airport and arrived in Amman, Jordan. The gyroscopes were later confiscated in Jordan. Russian authorities had to launch an investigation of the gyro smuggling case, which identified who the buyers and sellers were, but which failed to lead to the prosecution of Russian smugglers.

Explaining Chinese Cooperation in International Security Institutions

Alastair Iain Johnston, professor of government at Harvard University, attempts to explain the variation in Chinese participation in global and regional arms control processes by developing and testing so-called sociological arguments. This project explores the microprocesses of socialization by examining China's policies toward regional security institutions, strategic nuclear arms control, and land mines. Johnston offers China's experience in the Comprehensive Test Ban Treaty (CTBT) as illustrating the broader set of cases studied in the project, which relies on interviews, institutional analysis, and primary materials.

Sociological Environments versus Economistic Boxes

There has been a growing interest in recent years in so-called sociological approaches as opposed to economic or material welfare–maximizing approaches to international relations. In the study of the effects of international institutions on interstate cooperation, this usually means juxtaposing normative, "socially constructed" motivations (e.g., social obligation) with economic or material motivations (the effects of behavior for an actor's ability to optimize some material welfare).

by
Alastair Iain
Johnston

In reality both the sociological and economistic approaches are fairly diverse and more complex than their stereotypical portrayal often suggests; there are, however, distinctive metaphors that may be used to capture the differences between the two broad perspectives. Economistic approaches (e.g., contractual institutionalism) generally view institutions via a "container" metaphor, that is, as collections of rules and norms that "box in" state actors through material sanctions or rewards. New information may alter beliefs about how to conduct strategic interaction but will not alter the underlying goals and desires of the actors. No theoretical reasons are given to expect that strategic interaction among optimizing actors will change their basic preferences. The functionalist nature of this approach means that there are "objectively" certain types of institutional designs that are optimal for certain kinds of cooperation problems. The issue is to ensure that actors have the information and resources to harmonize the cooperation problem with the institutional design. Otherwise, outcomes will be suboptimal.

Sociological approaches, on the other hand, view institutions as "environments" of social interaction, rather than as "boxes" of material constraints. This paradigm examines the nonmaterial factors (e.g., psychological, affective, ideological) generated by human interaction that produce pro-group behavior. In other words, it holds that social interaction can change an actor's desires, wants, and preferences or bring new ones into play.

The main problems with sociological approaches to date are twofold. First, there has been a relative neglect of the microprocesses by which social interaction inside international institutions actually leads to conformity with group norms. Second, the cases of socialization have tended to be relatively "easy" and the issues at stake have tended not to

relate to relative power capabilities. That is, there have been relatively few studies of the hard (or "least likely") case of security policy—where one might plausibly argue that socialization processes have led to compliance with group norms even when such compliance has constrained or promises to constrain relative power. Drawing from sociology and social psychology, here I apply one of the major microprocesses of socialization—social influence—and then examine the effects of social influence on Chinese cooperation on an issue that clearly implies some constraints on relative power, the CTBT.[1]

Social Influence: The Pull to Conform

Social influence refers to a class of microprocesses that elicit pro-normative behavior through the distribution of social rewards and punishments. The rewards and punishments are social because only groups can provide them, and only groups whose approval an actor values will have this influence. Thus social influence rests on the "influenced" actor having at least some prior identification with a relevant reference group. Social influence involves connecting extant interests, attitudes, and beliefs in one "attitude system" to those in some other attitude system; for example, attitudes toward cooperation get connected to seemingly separate attitudes toward social standing, status, and self-esteem in ways that had not previously occurred to the actor.

There is considerable evidence that identification with a group can generate a range of cognitive and social pressures to conform. But the microprocesses of social influence are multiple, complex, and still the subject of much debate. Generally, however, the literature on social influence has isolated the following possibilities. As will be evident, the boundaries between these microprocesses are blurry.

The first cluster of arguments comes from social identity theory (SIT). There is powerful evidence in SIT that mere self-categorization as a member of a particular group generates strong internal pressures to conform to the group's norms and practices. Identification with a group leads to exposure to prototypical traits of this category or identity. Group members hang their self-esteem on appearing to be pro-group (leading to more extreme prototypical group norms over time).

A second possibility has to do with social liking. Liking typically means that an individual experiences a sense of comfort interacting with others with whom she or he is perceived to share traits. The actor will be more likely to behave in ways preferred by the liked person or group of persons when in their presence.

A third possibility comes from consistency theory. There is considerable experimental and field research that suggests people are loath to appear inconsistent with prior behavior or publicly affirmed beliefs. They experience discomfort when being perceived as inconsistent or hypocritical and, conversely, experience positive mood when being viewed as consistent with past commitments. Membership in a group usually entails "on-the-record" statements or behaviors of commitment that, even if relatively minor, establish a baseline or threshold identity such that behavior that diverges from these identity markers gives rise to discomforting inconsistencies.

Finally, the desire to maximize status, honor, prestige—diffuse reputation or image— can be another driver behind group-conforming behavior, or its obverse, the desire to avoid a loss of status, shaming or humiliation, and other social sanctions. There are many

reasons to maximize status. Often status brings with it power, wealth, and deference, and vice versa, but, just as often, status markers and immediate material gains are not correlated. Recognition and a high status image may be valued in and of themselves; these are traits that necessarily depend on *public* affirmation of one's social worth by a relevant audience. Overall, social influence processes require a forum or institution that renders conformity, nonconformity, and status to be public, observable acts.

When Does Social Influence Work?

These conditions suggest certain specific hypotheses about the relationship between international institutional design and social influence on actors at the level of national foreign policy agencies. These hypotheses depend on systematic conceptualization of variation in institutional design, that is, a typology of institutional forms or institutional social environments. Unfortunately none exists in international relations research at the moment. But one could imagine at least several dimensions for coding institutions as social environments. Here I am borrowing and expanding on the typology of domestic institutions developed by Ronald Rogowski:

1. membership: small and exclusive or large and inclusive;

2. decision rules: unanimity, consensus, majority, supermajority;

3. mandate: to provide information, to deliberate and resolve, to negotiate and legislate;

4. autonomy of agents from principals: low through high.

Different institutional designs (combinations of measures on these four dimensions) would thus create different kinds of social environments, leading to differences in the likelihood and degree of group influence. Social influence is more likely to be prevalent in institutions in which membership is large (this maximizes the accumulation of back-patting/shaming markers); decision rules are majoritarian (behavior is on record and consistency effects may be stronger); the mandate involves negotiations over the distribution of benefits; and the autonomy of agents is low (agents have to represent principals, thus reducing the effects of persuasion on agents).[2]

China and Social Influence: Evidence from the CTBT

China's decision to sign the Comprehensive Test Ban Treaty in 1996 may be viewed as a "hard" case from the perspective of socialization theory. It was clear from the start that China's decision makers were not especially interested in a test ban treaty. In particular, the nuclear-testing community was opposed to any agreement that would freeze the asymmetries in Chinese nuclear warhead designs and those of the two nuclear superpowers, the United States and Russia. The CTBT was a high-profile, multilateral negotiation environment in which bargaining behavior and decisions were relatively apparent and the issues at stake were distributive. A great deal of international attention, partly maintained by nongovernmental organizations, was directed at the negotiations and at China in particular because main observers recognized the concerns China had with the treaty process.

China's bargaining position at the start of negotiations in 1994 was designed to buy time for the testing program and, if possible, to ensure that the restrictions on warhead

modernization and the intrusiveness of the verification procedures were minimal. Thus, for instance, China initially proposed that a test ban treaty allow states to conduct peaceful nuclear explosions for scientific and economic purposes.

By the end of 1995,however, it appeared that the Chinese leadership had decided that a treaty was highly likely by mid-1996, and that China would be obliged to sign. From that point onward, the bargaining focused on specific issues such as on-site inspection, not on the main features of the test ban itself. The Chinese tried to ensure that on-site inspection would be as difficult as possible,mainly to prevent what they believed might be the abuse of demands for on-site inspection, by the United States in particular, to score political and diplomatic points. By late summer of 1996, the United States and China had worked out a compromise on on-site inspections, clearing the way for formal signature.

The puzzle the CTBT presents is that by most accounts,based on interviews with Chinese nuclear weapons specialists and U.S.specialists on Chinese nuclear weapons,the treaty has in fact frozen Chinese warhead modernization at a stage that could impinge on China's ability to modernize its nuclear forces,particularly in an era of national missile defense in the United States. The common refrain is that the CTBT was a sacrifice, with many in the nuclear-testing community and in some parts of the People's Liberation Army being unhappy with China's signature. The Cox Report, the high-profile congressional report on Chinese nuclear and missile development, is itself contradictory on whether China's last warhead-testing series was successful in developing the kinds of designs needed for a next generation of ballistic missiles.[3] Thus it is simply not clear that by the end of 1995 (when China was still two tests away from the end of the series) the Chinese leadership had evidence that it could be highly confident of the success of any new warhead design. The leadership appears,then, to have agreed to a militarily constraining agreement, in an era of unipolarity when realist theories, at least, would expect China to be an exceptionally jealous guardian of its relative power. In addition, the decision to sign on to the treaty was made before there was substantial evidence that India would not join the treaty. Thus China could not initially count on India's opposition to the treaty to delay entry-into-force. Besides, the Chinese realized that signature, even without formal entry-into-force, means that China is strongly normatively bound not to act in ways inconsistent with the goals of the treaty. There were also no substantial offers of material side payments,nor threats of material sanctions (after 1994, after all, the U.S. Congress was essentially opposed to the CTBT) to compel Chinese signature.

On the basis of a number of interviews with arms control specialists and officials in the Chinese policy process and in foreign governments who were negotiating with the Chinese, it seems that one of the more powerful considerations in the Chinese decision was precisely the concern about diffuse image. The language used by Chinese interlocutors to discuss joining and then signing was status oriented. The CTBT was a "great international trend";there was a nebulous "psychological pressure" to join once the United States, Russia, the United Kingdom, and France had committed themselves, and there was clear, strong support among developing states. China's signing was consistent with its being a "responsible world power," and joining the treaty was part of a "global atmosphere" such that China would have been isolated had it ignored this atmosphere. One of the members of the Chinese CTBT delegation argued publicly in a report written for Stanford Univer-

sity's Center for International Security and Cooperation (the first statement of this kind as far as I am aware) that one of the key reasons why China ended up supporting the CTBT was "opinion" among developing states: "Taking into account its historical friendly relations with them, China had to maintain its image in third-world countries. China's image as a responsible major power is reportedly moving to the fore. The necessity of maintaining its international image was a reason for China's decision to adjust its position on the CTBT negotiations."[4] These are unusually direct admissions of the impact of this form of "international pressure" from a regime that has traditionally publicly claimed that diplomatic pressure on China is counterproductive. That the Chinese bargained hard over verification issues—in particular on-site inspection—even in the face of considerable dismay among delegations, does not undermine the argument about social influence. Bargaining to dilute the verification elements of the treaty in the last months of negotiations was premised on the existence of a basic acceptance of the core "distributional" features of the treaty.

Conclusion: The Value Added of Socialization Theory

Socialization theory is a promising, if underdeveloped, new approach to the analysis of the effects of international institutions on state behavior. It need not be an explanation competitive with traditional economistic contractual institutionalist accounts of cooperation in organizations. Leaders decide to cooperate for a number of different reasons, material and social.

But socialization theory does in some cases present a challenge to traditional contractual theory. For example, if social influence is at work in institutions, it suggests that contrary to the contractualist assumption about group size and collective action problems, larger groups may help reduce problems of cooperation because of the opportunities for generating more back-patting incentives and opprobrium disincentives. The case of Chinese cooperation in the CTBT process is but one important example suggesting the value of treating international institutions as social environments.

Notes

1. The other microprocesses are persuasion and mimicking. Space does not permit a detailed discussion of these processes.

2. Persuasion—fundamental changes in actors' cause-effect understandings of the world—is more likely to occur under opposite conditions, namely, when membership is small, decision rules are by consensus, the mandate is deliberative, not distributive, and the autonomy of agents is high.

3. The Cox Report is known formally as the Final Report of the Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China (May 1999).

4. Zou Yunhua, *China and the CTBT* (Stanford, Calif.: Stanford University, Center for International Security and Cooperation, December 1998).

Part III: Weapons of Mass Destruction and New Threats

Ten

Management of Surplus Nuclear Material in Russia

Gary Bertsch and Igor Khripunov are based at the Center for International Trade and Security at the University of Georgia. This project addresses the consequences of disarmament and demilitarization in Russia. It also examines how surplus nuclear material is managed, including sales methodologies, the types of stockpiled material, and approaches to surplus management that will promote peace and security. The project was facilitated with a workshop.

Russia's Nuclear Achilles' Heel: Nonweaponized Fissile Material

by
Gary Bertsch
and Igor
Khripunov

It is estimated that about 1,350 metric tons of weapons-grade plutonium and highly enriched uranium are scattered across Russia in three hundred buildings and fifty sites. Roughly half of this material is incorporated in weapons; the other half is in various forms, such as metals, oxides, solutions, and scrap. With some exceptions, the bulk of this material belongs to the Ministry of Defense and the Ministry of Atomic Energy (MINATOM)—from whom the Ministry of Defense procures nuclear weapons. Throughout their service life nuclear weapons change hands between MINATOM, as the manufacturer responsible for their maintenance, and the Ministry of Defense, as the agency in charge of operating nuclear weapons. Both ministries have specially authorized personnel with mutually acceptable clearances who have access to each other's facilities. Annually, they are required to follow a procedure whereby their registration logs are thoroughly checked to see to it that all nuclear weapons transferred from one ministry to another are accounted for. MINATOM, licensed by the government in 1999 to become the sole agency to use nuclear energy for defense purposes, is responsible for nuclear weapons dismantlement and storage of fissile material.

The most vulnerable part of Russia's weapons-grade fissile material is the nonweaponized component, mostly in MINATOM's custody. According to a preliminary study by the Los Alamos National Laboratory, Russia has at least fourteen sites with weapons-grade plutonium; nine sites with weapons-grade uranium; seventeen sites with fresh-fuel highly enriched uranium; fourteen sites with nuclear fuel in decommissioned naval cores; twenty-seven sites with highly enriched uranium; three sites with neptunium;

two sites with reactor-grade plutonium; and nine sites with spent-fuel highly enriched uranium. Testifying on February 3, 2000, before the Senate Armed Services Committee, CIA director George Tenet said that while there was no evidence to suggest there had ever been a diversion of a nuclear weapon from Russia, it was fissile material that he was more worried about. Most committee members echoed his concern. The discussion in the committee implied that nonsafeguarded surplus fissile material in Russia was being raised to the level of a serious threat to U.S. national security.

The threat of "loose nukes" in the former Soviet Union has been thoroughly covered by numerous reports and books. In February 2000 a report entitled *Managing the Global Nuclear Materials Threat* was issued by the Washington, D.C.–based Center for Strategic and International Studies (CSIS). Led by former senator Sam Nunn, the CSIS task force asserted that nothing could be more central to international security than ensuring that the essential ingredients of nuclear weapons did not fall into the hands of terrorists or nuclear-proliferate states. However, secure storage of Russia's fissile material, which was the main focus of the report, should not be the sole objective. Concurrently, there should be more efforts to effectively deal with the huge surplus of weapons-grade material by reducing or making it irreversibly unusable for the weapons purpose. This dual-track approach would serve the important goal of preventing the diversion or theft of weapons-grade material in the immediate future. In addition, given Russia's volatile political situation and economic hardships, this approach could be a safeguard against a rapid return to the production of thousands of nuclear weapons if militaristic forces hostile to the West prevail in Russia.

In January 2001, the Russia Task Force, a bipartisan group cochaired by Lloyd Cutler and Howard Baker, delivered the results of its yearlong study of Department of Energy (DOE) nonproliferation programs in Russia. The task force reviewed seven DOE programs, including Material Protection Control and Accounting (MPC&A), which was the first program to be established as a result of the Nunn-Lugar initiative, to assess their effectiveness and prospects for long-term sustainability. The report referred to the MPC&A program as "the first line of defense" in combating proliferation and recommended that its goal of securing all fissile materials in Russia be pursued "aggressively." The task force concluded that funding for the MPC&A program should be significantly increased over the FY 2001 level of $173 million in order to expand the scope and increase the pace of the program.

Outdated Safety Systems and Insider Threats

The collapse of the Soviet Union has made dangerously antiquated whatever system of safeguarding nuclear material existed in the past. In the former Soviet Union, emphasis was given primarily to "guards, gates, and guns" to control nuclear materials and to ensure these materials did not leave their locations. The preeminent role of the KGB in controlling Soviet society, as well as in screening and supervising the facilities' personnel, virtually eliminated the threat of diversion or theft schemes made by insiders. In addition, the loyalty and patriotism of those in the employment of the Soviet nuclear weapons complex was enhanced by the highly prestigious status they enjoyed. With the disintegration of the Soviet Union and a demand for nuclear material on Russia's black market, the situation

has changed dramatically. Insiders, whose salaries dropped and who faced increased uncertainty in their professional careers because of economic crisis and overall downsizing of the nuclear complex, found themselves in possession of valuable information. Hypothetically, most of them could pass this information on to outsiders, divert material themselves, or assist others by providing access or by disabling alarms.

Several other factors contributed to an environment susceptible to successful diversions. Most Soviet nuclear facilities were built in the 1950s and 1960s in response to security requirements different from those of today and have not been overhauled to adjust to present realities. For example, the construction design of these facilities had been focused on easy and less costly maintenance rather than on security imperatives.

Because of economic upheavals in the 1990s, Russia's nuclear industry lost most of its cadres at the mid-level managerial strata, who moved to other industrial sectors, including private companies. This led to an accelerated aging process among the leadership and hence low personnel mobility. As a result, employees stayed at the same office for extended periods of time, developing relationships of mutual trust and personal friendship. This situation facilitated easier criminal collusion among insiders and, conversely, hampered meticulous compliance with internal regulations.

Social unrest at nuclear facilities has become a powerful destabilizing factor. The nuclear industry's trade union, whose membership covers both the nuclear weapons complex and its civilian sector, has authorized numerous strikes and sit-ins in protest against the delays in salaries and the shrinking social safety net. Organizations located in closed nuclear cities have established their own association to coordinate their campaign inside the nuclear weapons complex. The current scheme of downsizing without adequately funded conversion projects to compensate for the loss of jobs has led to low morale and an unstable psychological environment in the nuclear defense complex.

In 1995 Russia's Nuclear and Radiation Safety Oversight Authority (GAN) released a report on known and documented diversions and thefts in Russia. All of the cases presented had been made possible by inside operatives. For example, in October 1992, 1.5 kilograms of highly enriched uranium were stolen from the science and production association Luch, which is under the jurisdiction of MINATOM and still has sizable stockpiles of nuclear material. Another well-publicized case involved a total of 2 kilograms of 36 percent–enriched uranium stolen in July 1993 from the Andreeva Gubai naval base (Russia's navy is an independent custodian of nuclear fuel for propulsion purposes). The final report of the technical investigation indicated that the stolen items were parts of three new assemblies of the BM-4AM-type submarine nuclear reactor. The perpetrators were two navy officers and two privates who wanted to make money by selling the items on the black market of nuclear materials. The storage facility was equipped with a protection system against nuclear attack, which included a control system against a self-sustaining nuclear chain reaction, a fire prevention system, and a flood alarm system. However, there was no effective system installed to prevent an act of insider theft.

One of the most recently reported insider-instigated incidents was the theft of a quantity of transuranium element californium 98, which came from a nuclear-powered icebreaker in a facility under the jurisdiction of the Shipbuilding Ministry. The perpetrators intended to sell the material to an organized crime group in St. Petersburg, which appar-

ently wanted to possess a highly radioactive substance for carrying out hired contract killings; a victim exposed to a powerful radiation source in the office or a car would eventually die without arousing much suspicion.

Corrupt Customs Officials and Smuggling

If fissile material has been stolen, there are grounds to believe that it could be easily smuggled out of Russia, whose customs service is lacking both sophisticated equipment and trained personnel. What is of even greater concern, however, is the rampant corruption among customs officers. According to Russian government sources, criminal proceedings were instituted in 1999 against thirty-five customs employees, including eighteen officials of the Moscow-based central staff. Thirty percent of them involved groups of customs officers acting in collusion and accepting bribes in exchange for letting undocumented items in or out of the country. As long as corruption prevails, there is no need to try to bypass the customs service; stolen material can be legally shipped inside containers for radioactive substances while corrupt officials waive cumbersome verification procedures. Annually, several thousand new customs officials are recruited throughout Russia. The screening process determined that at least eighteen applicants out of a total of more than three thousand were to be planted inside the customs service by major criminal groups in 1999.

Other than through corrupt customs officials, there are several other ways to smuggle successfully. Russia's borders with the former Soviet republics are porous. Inside those republics, there are numerous intensive or low-intensity conflicts in areas that are reportedly used for illegal transshipment (Abkhazia and Southern Ossetia in Georgia; Chechnya, Gornyi Altai, and Ingushetia in Russia; Transdnestria in Moldova, and Nagorno-Karabakh in Azerbaijan).

The Roles of MINATOM and GAN

There are many reasons why safeguarding fissile material is still a problem in Russia and, in fact, it would be surprising if it were otherwise in the midst of Russia's economic recession and upheavals. Budgetary allocations have been negligible while a legal and regulatory basis for the control of nuclear material is only in the making. Under the existing division of labor, MINATOM has the authority for accounting and control and shared responsibility for physical protection, while GAN performs oversight functions in this area. Both MINATOM and GAN participate in the drafting of federal regulations—for governing material accounting and control as well as physical protection—together with other agencies such as the Defense Ministry, Interior Ministry, Economics Ministry, and Justice Ministry. As far as physical protection is concerned, MINATOM serves several roles: it coordinates the relevant activity of other agencies, acts as the national authority and contact point in the framework of the Physical Protection Convention (adopted in the framework of the International Atomic Energy Agency), oversees compliance with Russia's obligations stemming from its membership in the International Atomic Energy Agency, acts as the lead agency for ensuring nuclear and radiation safety during transportation of nuclear materials, and certifies all technical means used for physical protection purposes.

In the accounting and control area, the role of MINATOM is even more pervasive. MINATOM was designated as the agency responsible for managing the federal accounting and control system in regard to radioactive substances and waste. MINATOM is also responsible, among other things, for collection and evaluation of relevant information at the regional and departmental levels, R&D activity for improving the regulatory system, operation of a federal information and analytical center for accounting and control, cooperation in the framework of international agreements and programs, and other related activities.

The evolving legal basis stipulating that nuclear materials are subject to physical protection, and accounting and control at all levels, is not, however, a model of clarity. Vague and ambiguous language leaves room for interpretation on specific roles and authorities. Moreover, the statutes of some agencies dealing with nuclear materials do not have specific provisions regulating their use and coordination with other agencies. The overall Russian legal system—consisting of federal laws, presidential decrees, government resolutions, and departmental orders—often adds to the confusion. There are continuous tensions in the relationship between MINATOM and GAN.

Radioactive Materials and Russia's Criminal Code

An additional disincentive should be provided by Russia's Criminal Code. According to its Article 221, stealing or extortion of radioactive materials (no distinction is made between weapons-grade and nonweapons-grade materials) is punishable by a fine ranging from the equivalent of 700 to 1,000 minimal salaries; or to an aggregate salary or other incomes of the convicted person for a period from seven months to one year; or by imprisonment for up to five years. The same article provides for more harsh punishment (up to ten years of imprisonment) if specified aggravating circumstances are proved. It remains to be seen, however, whether the Russian government is prepared to punish the crimes of diversion and theft to the fullest extent of this article. A major hurdle to regulation is that no accurate inventory of Russia's fissile material stockpiles has been made. As a result, any court proceedings have to be based on physical evidence of an actual theft rather than discrepancies between inventoried quantities and past records. In other words, in order to be convicted, perpetrators must be caught red-handed.

U.S. Role in Upgrading Russian Safety Systems

Given the financial and other limitations the Russian government is faced with in safeguarding its fissile material, since 1994 the DOE's MPC&A Program has been working with forty nuclear sites in Russia to upgrade their systems. The program started with Russia's civilian nuclear facilities (research institutes and power plants) and since then has expanded to include the country's nuclear weapons complex and some of the Russian Navy's nuclear facilities. The projects of the program have involved the installation of modern safeguard systems that include security fences, barriers and gates, personnel and vehicle portals and monitors, locks, interior and exterior motion sensors, video cameras, alarm communication and display equipment, tamper-indicating devices, nondestructive assay equipment, scales, bar codes, computerized accounting systems, and badging and access control equipment. Another U.S. government program involves the building of the

Fissile Material Storage Facility (FMSF) at Mayak, Chelyabinsk oblast. The facility is designed to accommodate the bulk of weapons-grade plutonium released from Russia's nuclear weapons as a result of the disarmament process. This bilateral project is managed by the Department of Defense and is scheduled for completion in 2002.

In 1995 U.S. officials of the MPC&A program estimated that the entire job, that is, securing nuclear materials at eighty to one hundred facilities, would cost roughly $800 million through 2002, or about $10 million per facility. However, since these assumptions were made, the MPC&A program management has greatly expanded knowledge about and access to sites and buildings containing weapons-grade nuclear materials. As a result, many now realize that the problem is larger and more complex than originally understood. There are at least twenty-five more sites than initially identified, over three hundred more buildings than originally planned, and approximately 30 percent more nuclear material than earlier estimates had predicted. Moreover, the program management recognized a need to promote the ability of these sites to sustain the upgrades, that is, their ability to fully operate and maintain the system over the long term using site resources. Issues of long-term sustainability of these systems were not always anticipated and addressed while the systems were being installed. An important thrust of the sustainability effort is to instill the MPC&A culture among Russian officials and managers in the nuclear industry. To reflect these new realities, President Clinton's Expanded Threat Reduction Initiative proposed for the fiscal 2001 budget included an additional $100 million for a variety of DOE projects in Russia, including the safeguarding of its nuclear materials.

Prospects for the Future: Need for Diversification

The challenge of protecting, accounting for, and controlling Russia's surplus fissile materials clearly goes beyond Russia's national interests; it is also in the U.S. and global interests. Foreign assistance, mostly from U.S.-sponsored programs, can and is, indeed, making a difference. This assistance must be increasingly diversified to cover not only the MPC&A area but also the consolidation and reduction of stockpiles, the nonproduction of weapons-grade materials, defense conversion, and other related activities.

It is of paramount importance to identify and promote more commercial projects that could engage Russia's nuclear industry, thus generating additional revenues and making it more responsive to foreign partners. Russia, for its part, should invest more money and effort toward indigenizing and sustaining the MPC&A program, which is currently financed and supported mostly by outside donors. Much has been accomplished in the past decade. Much more remains to be done.

Between Prudence and Paranoia

The Middle Ground in the Weapons-of-Mass-Destruction Terror Debate

Jessica Stern, based at Harvard University, considers the dangers of terrorism in the United States from nuclear, chemical, and biological weapons in light of the reportedly expanding operations of transnational terrorist groups and the increasing sophistication and enhanced possible access to weapons-of-mass-destruction components. The research attempts to develop a framework for analyzing the scope of the problem and to explore the range of policy responses.

Optimists and Pessimists

by
Jessica
Eve Stern

Will terrorists use unconventional weapons? Debate about this question tends to be conducted in extremes. Optimists argue that terrorists "want a lot of people watching not a lot of people dead," that they prefer "patient harassment" to large-scale murder and are unlikely to turn to weapons of mass destruction.[1] Pessimists, on the other hand, argue that, because of the growing availability of unconventional weapons, acts of macro terror resulting in hundreds of thousands or even millions of deaths are all but inevitable.

Trends in terrorism suggest that the truth lies between these two extremes. On the one hand, using unconventional weapons to create mass casualties appears to be far more difficult than the popular literature suggests. The terrorists would need to disseminate or detonate the weapons, presenting technical and organizational obstacles that few groups would be able to surmount. Moreover, relatively few terrorists would want to kill millions of people, even if they could.

On the other hand, several recent examples suggest that some terrorists do want a lot of people dead or injured, and that they are increasingly considering unconventional weapons with this goal in mind. To turn Brian Jenkins's famous phrase around—some terrorists appear to be attracted to unconventional weapons, not to kill large numbers, but to get more people watching. Chemical, biological, and radiological weapons evoke dread out of proportion to their lethality, making them suited for theatrical acts of violence calculated to attract attention.

Groups that are candidates for using unconventional weapons successfully must possess three characteristics: (1) the desire to use unconventional weapons despite formidable political risks; (2) the capability of acquiring the agents and a dissemination device (however crude); and (3) an organizational structure that enables the covert delivery or dissemination of the agent.

With regard to motivations, terrorist attacks, while growing less frequent in recent years, are reportedly growing more lethal, suggesting that moral constraints against killing large numbers may be eroding, at least for some groups. In a possibly related develop-

ment, religiously motivated groups are reportedly becoming more common and increasingly violent. Of eleven international terrorist groups identified by RAND in 1968, none were classified as being religiously motivated. By 1995, however, religious groups accounted for 25 percent of international terrorist incidents and 58 percent of the total number of fatalities. Terrorists are also showing greater interest (not necessarily combined with technical or organizational capacity) in weapons of mass destruction. Before the Aum Shinrikyo attack and the Oklahoma City bombing, the FBI typically encountered about a dozen incidents a year involving threats, boasts, or actual attempts to acquire or use weapons of mass destruction. Now the FBI is handling several hundred such cases per year, most of which are hoaxes.

Would-Be Terrorists?

The literature provides a number of examples of groups or individuals who have demonstrated (or described) their interest in acquiring chemical or biological agents. The American cult called the Covenant, the Sword, and the Arm of the Lord (CSA) is one example.[2] This group acquired cyanide with the aim of carrying out mass-casualty attacks. The group's objective was to hasten the return of the Messiah by "carrying out God's judgments" against unrepentant sinners. Its plan was not workable, and the FBI penetrated the group before operatives could attempt to carry the plan out. The cult is primarily of interest because of what is now known about its motivations.

Four factors appear to have played a role in freeing CSA members from the moral and political constraints that apparently hold most terrorist groups back. First, the group was persuaded that Armageddon was imminent. Therefore, they felt morally obligated to carry out God's judgments, to "pour out the seven bowls of the anger of God upon the earth," to inflict wounds upon the sinners who are marked by the beast and worship his image.

Second, CSA members were not particularly fearful of a government crackdown. They flouted the government's authority by acquiring military weapons, selling hate literature at gun shows, and writing antigovernment articles in the local paper.

Third, they were not fearful of offending a constituency. James Ellison, the group's leader, claimed to be deliberately trying to shock the people into becoming "a tool that we could use." And their racist ideology made them feel that their intended victims were subhuman, and that killing them was therefore not a sin.

Fourth, group members displayed many symptoms of "politicized paranoia" as defined by Robert Robbins and Jerrold Post.[3] They suffered delusions of grandeur, centrality (the belief that they and their actions were of intense interest to everyone, especially their enemies), profound suspicion of the government, and premonitions of doom.

Another example is Larry Harris, who in April 1995 acquired the bacterium that causes bubonic plague. Harris claimed to be planning to develop his own medical countermeasures, but he shared CSA's racist ideology, grandiosity, paranoia, and premonitions of doom. These characteristics appear to be common among the relatively small number of groups that have acquired or attempted to use chemical or biological agents.[4]

In a subsequent incident in February 1998, Harris boasted to an informant that he had enough "military-grade anthrax" to "wipe out" all of Las Vegas. Eight bags marked

"biological" were found in the back of a car he and his accomplice were driving. Several days later, federal authorities learned that the "military-grade anthrax" Harris had brought to Las Vegas was a vaccine strain not harmful to human health, but the incident frightened a lot of people in Las Vegas and around the country. Tabloids in New York ran stories with headlines like "Subway Plague Terror" and "Feds Nab 2 in Toxic Terror." The incident sparked an astonishing proliferation of anthrax hoaxes and threats in the second half of 1998, continuing into 1999. Perpetrators include Identity Christian and other antigovernment groups, extortionists, antiabortion activists, and presumed pro-choice groups. In many cases the perpetrator's motives were unknown, but some incidents appear to have been carried out as student pranks, demonstrating the extent to which the threat of anthrax has entered Americans' consciousness.

Decentralized Networks and Technological Developments

With regard to institutional constraints, terrorist groups have begun organizing themselves as networks or virtual networks rather than large organizations, often with the explicit purpose of evading law-enforcement detection. Domestic extremists in the United States are increasingly operating according to the principle of "leaderless resistance," which involves "phantom cells" or individuals operating on their own, without communicating directly with the leadership of the movement that inspires them. In addition to making it more difficult for law-enforcement authorities to monitor antigovernment activities, virtual networks enable individuals who are socially ill at ease to work together on a common cause, without having to meet face-to-face. International terrorist organizations, similarly, are forming loose affiliations that operate across national boundaries, making them harder to identify, penetrate, and stop.

In the area of technology, a number of developments may make it easier for terrorists or their sponsors to acquire unconventional weapons. Advanced fermenters make it easier to optimize growth of biological organisms, and new technologies for coating and aerosolizing micro-organisms make dissemination less challenging. Inadequately secured WMD materials in the former Soviet Union, and inadequate pay for WMD scientists, may eventually lead to significant leakage of WMD or related expertise.

In summary, motivational, organizational, and technical constraints are eroding, and they have been eroding for some time. Why, then, have unconventional-weapons attacks been so rare? Explanations include the possibility that the groups that are now organized to evade law-enforcement detection are not yet capable of overcoming technical constraints; and that those who do have access to WMD may have been stopped by law-enforcement authorities or fear of retaliation or may be incapable of disseminating the weapons covertly.

The Aum Shinrikyo cult's Tokyo subway attack is often held up as a watershed event in the history of terrorism. Many analysts assumed that copycat nerve-agent attacks would immediately follow. So far, those predictions have not been borne out. The cult's successes and failures are both instructive in this regard. Despite its size (estimated at tens of thousands of members), its wealth (reportedly over $1 billion), and its trained personnel (including doctors, scientists, and workers at Russian nuclear facilities), the cult's attempts to acquire workable nuclear and biological weapons failed. However, the group did succeed

in carrying out chemical attacks using crude equipment for dispersing gases. Its successful attacks were low-tech operations and assassinations that resulted in relatively small numbers of fatalities. If terrorists continue to use unconventional weapons, as I believe they will, these are the kinds of attacks that are probably most likely, not the catastrophic attacks often described in the literature.

Conclusion: "Dual-Use" Solutions

A number of analysts have complained that money is being thrown at the problem and that government is succumbing, in the words of Ehud Sprinzak, a leading Israeli scholar on terrorism, to a "great superterrorism scare."[5] There has been no analysis to date of the risk-versus-reward trade-offs that policymakers are making, and the possible negative repercussions of antiterrorism policies for human health, civil liberties, foreign policy, and the probability of terrorism itself. These studies are needed.

In the meantime, it is incumbent on governments to respond with prudence, not paranoia. It would be irresponsible to ignore the dangers of catastrophic attacks, given the eroding constraints described. But it is equally irresponsible to ignore the more likely threats, which involve conventional weapons, attacks perpetrated by insiders at industrial or food-processing facilities, and the use of crude devices to deliver CB agents or industrial poisons. Because the magnitude of the catastrophic threat is so difficult to calculate, it makes sense to focus on "dual-use" remedies. These include pursuing medical countermeasures that will improve human health, regardless of whether major biological attacks ever occur; improving epidemiological surveillance for human, animal, and plant diseases; increasing compliance with the Centers for Disease Control's regulations regarding "reportable" diseases and laboratory safety and security; upgrading security at border crossings; and finding alternative employment for former Soviet WMD scientists.

Notes

1. The idea that terrorists want a lot of people watching, not a lot of people dead, was popularized by Brian Jenkins in "International Terrorism: A New Mode of Conflict," in *International Terrorism and World Security,* ed. David Carlton and Caolo Schaerf (London: Croom Helm, 1975), 15.

2. This discussion of the CSA summarizes Jessica Stern, "The Covenant, the Sword, and the Arm of the Lord," in *Toxic Terror,* ed. Jonathan Tucker (Cambridge, Mass.: MIT Press, 2000).

3. Robert S. Robbins and Jerrold M. Post, *Political Paranoia* (New Haven, Conn.: Yale University Press, 1997), 140.

4. The material on Larry Harris is taken from Jessica Stern, "Larry Wayne Harris," in *Toxic Terror,* ed. Tucker.

5. Ehud Sprinzak, "Terrorism, Real and Imagined," *Washington Post,* August 19, 1998.

About the Contributors

David Albright is the president of the Institute for Science and International Security in Washington, D.C.

Gary Bertsch is a professor and director of the Center for International Trade and Security at the University of Georgia in Athens, Georgia.

Shaun Gregory is a senior lecturer in the Department of Peace Studies at the University of Bradford in the United Kingdom.

Alastair Iain Johnston is a professor of government at Harvard University in Cambridge, Massachusetts.

Geoffrey Kemp is the director of the Regional Strategic Program at The Nixon Center in Washington, D.C.

Igor Khripunov is the associate director of the Center for International Trade and Security at the University of Georgia in Athens, Georgia.

Jean Krasno is the associate director of United Nations Studies at Yale, Yale University, in New Haven, Connecticut, and executive director of the Academic Council on the United Nations System (ACNUS).

Deepa Ollapally is a program officer in the Grant Program and an expert on nuclear nonproliferation and South Asian security affairs at the United States Institute of Peace, Washington, D.C.

Kevin O'Neill is deputy director of the Institute for Science and International Security in Washington, D.C.

Vladimir Orlov is the founder and director of the Center for Policy Studies in Russia (PIR Center) in Moscow.

John Simpson is the program director of the Programme to Promote Nuclear Nonproliferation at the University of Southampton in the United Kingdom.

Richard Speier is an independent consultant on the proliferation of nuclear, chemical, and biological weapons and their delivery systems. He is based in Reston, Virginia.

Jessica Eve Stern is a lecturer at the Kennedy School of Government at Harvard University, Cambridge, Massachusetts.

James Sutterlin is distinguished fellow in United Nations Studies at Yale, Yale University, in New Haven, Connecticut, and director of the Yale Oral History Project on the United Nations.

Jean Pascal Zanders is the director of the Chemical and Biological Warfare Project of the Stockholm International Peace Research Institute in Sweden.

About the Institute

The **United States Institute of Peace** is an independent, nonpartisan federal institution created by Congress to promote research, education, and training on the peaceful management and resolution of international conflicts. Established in 1984, the Institute meets its congressional mandate through an array of programs, including research grants, fellowships, professional training, education programs from high school through graduate school, conferences and workshops, library services, and publications. The Institute's Board of Directors is appointed by the President of the United States and confirmed by the Senate.

Chairman of the Board: Chester A. Crocker
Vice Chairman: Seymour Martin Lipset
President: Richard H. Solomon
Executive Vice President: Harriet Hentges

Board of Directors

Chester A. Crocker (Chairman), James R. Schlesinger Professor of Strategic Studies, School of Foreign Service, Georgetown University

Seymour Martin Lipset (Vice Chairman), Hazel Professor of Public Policy, George Mason University

Betty F. Bumpers, President, Peace Links, Washington, D.C.

Holly J. Burkhalter, Advocacy Director, Physicians for Human Rights, Washington, D.C.

Marc E. Leland, Esq., President, Marc E. Leland & Associates, Arlington, Va.

Mora L. McLean, Esq., President, Africa-America Institute, New York, N.Y.

María Otero, President, ACCION International, Somerville, Mass.

Barbara W. Snelling, State Senator and former Lieutenant Governor, Shelburne, Vt.

Shibley Telhami, Anwar Sadat Chair for Peace and Development, University of Maryland

Harriet Zimmerman, Vice President, American Israel Public Affairs Committee, Washington, D.C.

Members ex officio

Lorne W. Craner, Assistant Secretary of State for Democracy, Human Rights, and Labor

Paul G. Gaffney II, Vice Admiral, U.S. Navy; President, National Defense University

Donald H. Rumsfeld, Secretary of Defense

Richard H. Solomon, President, United States Institute of Peace (nonvoting)

Other Titles in the Peaceworks Series

Passing the Baton: Challenges of Statecraft for the New Administration, with remarks by Samuel R. Berger and Condoleeza Rice (No. 40, May 2001)

From Revolutionary Internationalism to Conservative Nationalism: The Chinese Military's Discourse on National Security and Identity in the Post-Mao Era, by Nan Li (No. 39, May 2001)

El Salvador: Implementation of the Peace Accords, edited by Margarita S. Studemeister (No. 38, January 2001)

The News Media and Peace Processes: The Middle East and Northern Ireland, by Gadi Wolfsfeld (No. 37, January 2001)

Conflict Management Training: Advancing Best Practices, by Robert M. Schoenhaus (No. 36, January 2001)

Coercive Prevention: Normative, Political, and Policy Dilemmas, by Bruce W. Jentleson (No. 35, October 2000)

Women in War and Peace: Grassroots Peacebuilding, by Donna Ramsey Marshall (No. 34, August 2000)

Grappling with Peace Education in Serbia, by Ruzica Rozandic (No. 33, April 2000)

Three Dimensions of Peacebuilding in Bosnia: Findings from USIP-Sponsored Research and Field Projects, edited by Steven M. Riskin (No. 32, December 1999)

Building Security in Post–Cold War Eurasia: The OSCE and U.S. Foreign Policy, by P. Terrence Hopmann (No. 31, September 1999)

New Approaches to International Negotiation and Mediation: Findings from USIP-Sponsored Research, edited by Timothy D. Sisk (No. 30, August 1999)

Training to Promote Conflict Management: USIP-Assisted Training Projects, edited by David Smock (No. 29, July 1999)

The Challenge of Regional Cooperation in Central Asia: Preventing Conflict in the Ferghana Valley, by Anara Tabyshalieva (No. 28, June 1999)

Territorial Conflicts and Their Resolution: The Case of Ecuador and Peru, by Beth A. Simmons (No. 27, April 1999)

The Quest for Democratic Security: The Role of the Council of Europe and U.S. Foreign Policy, by Heinrich Klebes (No. 26, January 1999)

Nagorno-Karabakh: Searching for a Solution, by Patricia Carley (No. 25, December 1998)

Removing Barricades in Somalia: Options for Peace and Rehabilitation, by Hussein Adam and Richard Ford, with Ali Jimale Ahmed, Abdinasir Osman Isse, Nur Weheliye, and David Smock (No. 24, October 1998)

Muddling toward Democracy: Political Change in Grassroots China, by Anne F. Thurston (No. 23, August 1998)

Preventing Genocide in Burundi: Lessons from International Diplomacy, by Stephen R. Weissman (No. 22, July 1998)

The China Challenge in the Twenty-First Century: Implications for U.S. Foreign Policy, by Chen Jian (No. 21, June 1998)

Private Peacemaking: USIP-Assisted Peacemaking Projects of Nonprofit Organizations, edited by David R. Smock (No. 20, June 1998)

OF RELATED INTEREST

Several other recent publications from the United States Institute of Peace address issues related to weapons of mass destruction, nonproliferation, and regional stability.

RECENT INSTITUTE REPORTS INCLUDE:

Thinking Out Loud: Policies toward Iraq (Special Report, February 1999)

Mistrust and the Korean Peninsula: Dangers of Miscalculation (Special Report, October 1998)

"Trialogue": U.S.-Japan-China Relations and Asian-Pacific Stability (Special Report, September 1998)

Croatia after Tudjman (Special Report, August 1998)

To obtain an Institute report (available free of charge), write United States Institute of Peace, 1200 17th Street NW, Suite 200, Washington, DC 20036-3011; call 202-429-3832; fax 202-429-6063; or e-mail: usip_requests@usip.org.

RECENT BOOKS FROM USIP PRESS INCLUDE:

A Strategy for Stable Peace: Toward a Euroatlantic Security Community, by James E. Goodby, Petrus Buwalda, and Dmitri Trenin (2001)

Europe Undivided: The New Logic of Peace in U.S.-Russian Relations, by James E. Goodby (1998)

NATO Transformed: The Alliance's New Roles in International Security, by David S. Yost (1998)

For book sales and order information, call 800-868-8064 (U.S. toll-free only) or 703-661-1590, or fax 703-661-1501.