

U.S. POLICY ON BALLISTIC MISSILE PROLIFERATION: THE MTCR'S FIRST DECADE (1987-1997)

by Wyn Q. Bowen

Dr. Wyn Q. Bowen is a lecturer in the Department of War Studies at King's College in London. Previously, he served as Senior Research Associate of the Monitoring Proliferation Threats Project at the Center for Nonproliferation Studies of the Monterey Institute of International Studies. He received his Ph.D. from the University of Birmingham.

In the past two years, ballistic missile proliferation has experienced a resurgence as an issue of national security concern in the United States. Initially, this was stimulated by the Clinton administration's National Intelligence Estimate 95-19 (NIE 95-19) entitled "Emerging Missile Threats To North America During The Next 15 Years." This study concluded that "no country, other than the major declared nuclear powers, will develop or otherwise acquire a ballistic missile in the next 15 years that could threaten the contiguous 48 states and Canada."¹ But several Republican members of Congress claimed the estimate was politicized because of the Democratic administration's opposition to Republican plans to deploy a national missile defense

(NMD) system to defend the United States against limited ballistic missile attacks from so-called "rogue states."² This debate has kept the missile proliferation threat in the political spotlight.

While these political disputes have focused primarily on the priority that should be accorded to the deployment of missile defenses, the proponents and detractors of NIE 95-19 have raised questions regarding the future effectiveness of the Missile Technology Control Regime (MTCR) in restraining proliferation. NIE 95-19 built upon several assumptions to justify its conclusion vis-à-vis the future long-range missile threat to the United States. The estimate stated that countries currently possessing intercontinental-range ballistic mis-

siles (ICBM) could be expected not to sell them because each of these countries is an MTCR member, or has agreed to abide by the regime's guidelines, and recognizes that the transfer of an ICBM would show blatant disregard for the regime. The estimate also claimed that countries with space launch vehicles (SLVs) would probably not sell these items and that—even if they did—the ICBM conversion process would "involve technological obstacles roughly as challenging as those involved in an indigenous ICBM program." Finally, NIE 95-19 stated that the MTCR has significantly limited the availability of missiles and related components and technology and that it will "continue to serve as a substantial barrier to countries interested in acquiring ballistic missiles."³

The validity of these assumptions was subsequently called into question by a General Accounting Office (GAO) report requested by Republican Congressman Floyd D. Spence to assess the accuracy of the estimate. In August 1996, the GAO concluded that NIE 95-19 had misleadingly presented these and other "implicit critical assumptions" as "fact-based judgments."⁴ In December 1996, an independent non-governmental panel of experts led by former Central Intelligence Agency Director Robert Gates determined there was no evidence that NIE 95-19 had been politicized. However, the panel concluded that the estimate had placed "too much of a burden" on the regime "as a means of limiting the flow of missile technology to rogue states."⁵ Although it was acknowledged that the MTCR had been "a positive influence" in restraining proliferation, the panel emphasized that the regime is entirely voluntary and "each country makes its own decisions."

Coincidentally, April 1997 marked the 10th anniversary of the MTCR, which was formed in 1987 by the United States and its G-7 allies (Canada, France, Italy, Japan, the United Kingdom, and West Germany) as a voluntary arrangement designed to restrain the proliferation of nuclear-capable ballistic and cruise missiles. Although the MTCR was not intended to limit peaceful, civilian applications of rocket technology, the regime recognized the dual-use nature of SLV technology. Accordingly, the regime sought to control the transfer of civilian as well as military rocket technology. In 1993, member states broadened the regime's coverage to encompass missiles capable of delivering all weapons of mass destruction

(WMD) as a means of combatting increased chemical and biological (CBW) weapons proliferation. Moreover, since 1987, membership has grown from seven relatively like-minded states to 29 diverse nations, including Argentina, Brazil, Russia, and South Africa, each of which was once targeted by the regime.

Since its announcement, however, the MTCR has been surrounded by controversy. One of the most heated debates has been the issue of controlling the export of space launch technology. This has been a source of dispute between member and non-member states, among the member states themselves, and between certain agencies of the U.S. government. Other issues have involved the lax enforcement of the regime's guidelines by certain member states, Congress' enactment of a law to punish foreign and American entities that violate the regime's guidelines, and China's continued missile sales (despite its agreement with Washington to "adhere" to the guidelines). Such controversies are certain to continue in the future. Numerous instances of missile proliferation from Russia in recent months have called into question Moscow's ability and/or intention to enforce its MTCR commitments effectively. Furthermore, U.S.-Ukrainian negotiations over the latter's future membership in the regime have reached an impasse because of Kyiv's refusal to forfeit its inventory of Scud missiles.

Despite these controversies, missile proliferation has been slowed dramatically since 1987 by the MTCR, which has made ballistic missile development much more difficult for countries in the developing world by driving up both the economic and political costs associated with

proliferation. Given the resurgence of missile proliferation as a security issue and its coincidence with the 10th anniversary of the MTCR, this article traces the origins and development of both the regime and U.S. missile nonproliferation policy from the late 1970s until the present day. The article has several objectives. First, to identify pivotal points in the regime's formulation, beginning with its pre-history in the late 1970s and early-mid 1980s and moving through its various amendments over time. Second, to evaluate how effective the regime has been in restraining the proliferation of ballistic missiles since its founding in 1987. And, third, to cast some light on the politics which have surrounded the MTCR in the past decade, both within the U.S. government and among the member states of the regime. In its conclusion, the study considers some of the current problems confronting the MTCR as it looks to the challenges it must face in its second decade.

THE PRE-HISTORY OF THE MTCR

Identifying and Defining the Missile Threat (1977-1983)

While American concern with the horizontal proliferation of ballistic missiles can be traced at least as far back as the Egyptian-Israeli rocket race of the early 1960s, it did not become a significant issue until the late 1970s and early 1980s. Although this new attention was prompted in part by Soviet transfers of 280 kilometer (km)-range Scud-B missiles to several Arab countries, American concern intensified primarily because of the progress that several countries were making in developing and producing their own rockets. This centered on the activities

of five principal countries, including Israel, Libya, South Korea, Taiwan, and India. American concern was exacerbated by each country's simultaneous pursuit of civilian and suspected military nuclear programs. In short, Washington became anxious about the potential role ballistic missiles might play as delivery vehicles for nuclear weapons in the developing world.

All of these indigenous programs were dependent upon acquiring rocket components, technical know-how, and manufacturing technology from a limited number of primarily industrialized countries. In more than one instance, they benefited from the diversion of technology and know-how from the civilian sector. Towards the end of the Carter administration, the U.S. Arms Control and Disarmament Agency (ACDA) summarized the nature of the missile problem in its 1980 annual report, which stated that:

US technology (in the form of products or know-how) with direct applicability to missile production could indeed be purchased component by component, ostensibly for civilian purposes through normal commercial licensing procedures.⁶

By the end of the Carter administration, the U.S. government had identified the horizontal proliferation of nuclear-capable missiles as a growing threat to regional stability and, more importantly, to America's security and foreign policy interests. The United States had also defined the nature of the problem; while the Soviet Union was willing to sell Scud-B missiles to its client states in the Middle East, other developing countries were acquiring the necessary components, technical know-how, and manufacturing technology

from abroad to develop their own missiles indigenously. These items were acquired from industrialized countries, such as France, Italy, the Soviet Union, the United Kingdom, the United States, and West Germany. The fact that much of it was "dual-use" and at first glance did not appear directly relevant to missile development and production exacerbated the problem. By 1981, therefore, it was apparent that if missile proliferation was to be checked, then export controls in the United States and elsewhere would need to be reformed accordingly.

It was this foreign dependency that drove the Reagan administration to formulate a supply-side policy in an attempt to restrain the spread of nuclear-capable missiles. This policy manifested itself in National Security Decision Directive 70 (NSDD-70) of November 30, 1982. NSDD-70 instructed the relevant U.S. executive agencies to implement appropriate methods to restrain the spread of nuclear-capable ballistic and cruise missiles. The directive instructed that civilian rocket technology should be equally as controlled, and the U.S. government was directed to work with other missile technology suppliers to assemble whatever controls were decided upon on a multilateral basis. NSDD-70 officially broadened U.S. nuclear nonproliferation policy to encompass nuclear-capable, unmanned delivery systems. In doing so, the Reagan administration singled out ballistic and cruise missiles as the most destabilizing means of nuclear weapon delivery proliferating in the developing world.⁷

Responding to the Threat (1983-1987)

In conjunction with NSDD-70, the Reagan administration negotiated the MTCR with America's G-7 partners between 1983 and 1987. Member states jointly announced the regime's formation on April 16, 1987.⁸ The MTCR was not a legally binding international agreement nor a treaty—like the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)—but a voluntary arrangement designed to limit the risk of nuclear proliferation by controlling the transfer of equipment and technology that could contribute to the development and production of nuclear-capable, unmanned delivery systems.⁹ The participants had agreed to common guidelines and to a common annex of items to be controlled.¹⁰ In doing so, the G-7 countries sought to prevent any of the participants from gaining a commercial advantage over the other members.¹¹

Under the MTCR, states defined a nuclear-capable missile as one able to deliver a 500 kilogram (kg) or greater payload to a distance of 300 km or more. These parameters corresponded to the perceived minimum weight of an unsophisticated nuclear warhead, and to the "strategic distances in the most compact theaters where nuclear-armed missiles might be used."¹² These distances referred primarily to the Middle East, a region where missile and nuclear proliferation had become issues of major concern during the 1970s and 1980s.

Although the MTCR was not designed to limit the civilian application of rocket technology for peaceful purposes, the regime recognized that the technology used to develop and

manufacture SLVs is virtually identical with that used for ballistic missiles. The export of space launch technology was a contentious issue during the negotiations. It took the United States some 18 months to get all of the other G-7 countries to accept fully the notion that in order to have effective controls on ballistic missile technology, space launch technology would also need to be controlled.¹³ The issue of circumscribing the availability of space launch technology caused problems for several reasons. First, it meant the members would have to broaden their export controls to include dual-use items and not simply munitions. By restricting access to space launch technology, the member states would also run the risk of damaging their relations with countries in the developing world. Moreover, controls on civilian rocket technology threatened to damage legitimate, cooperative space ventures between member and non-member states.

The regime's annex of controlled items included equipment and technology directly "relevant to missile development, production and operation."¹⁴ All transfers of items listed on the annex were to be considered on a case-by-case basis, taking into account several factors—including nuclear proliferation concerns and the capabilities and objectives of the missile and space programs of the recipient state. The regime placed a special emphasis on controlling missile transfers to "projects of concern."¹⁵ The annex was divided into two categories. Category I consisted of a short list of very sensitive items that could contribute to rapid missile proliferation if exported.¹⁶ This included complete systems—such as ballistic missiles, SLVs, sounding rockets, cruise missiles, and target

and reconnaissance drones—capable of delivering at least 500 kg over a range of 300 km or more. Category I also incorporated specially-designed production facilities for these systems, and related sub-systems such as rocket stages, guidance sets, and rocket engines/motors. All export requests for Category I items were to be treated with a "strong presumption of denial" and the transfer of production facilities for such items was forbidden completely.¹⁷ Category II controls were designed to constrain those proliferators that could not acquire complete systems, production facilities, or major sub-systems from overseas. This list consisted of "dual-use" items, such as propulsion components, propellants, structural materials, flight instruments, inertial navigation equipment, and so on: all of which could be used to produce nuclear-capable missile systems indigenously.¹⁸ Export requests for Category II items were to be treated less sensitively, and their export was at the discretion of each government on a case-by-case basis.¹⁹

The announcement of the MTCR confirmed publicly something that had been implicit in U.S. policy since at least the mid-1970s. Washington perceived the spread of nuclear-capable missiles as a greater threat to regional stability—and to America's security and foreign policy interests—than the proliferation of any other type of delivery system. At the press conference held in Washington to announce the regime, an official from the Reagan administration said the "speed and surprise" that can be achieved with missiles were "far greater than that achievable with manned aircraft" and thus constituted a more potent form of nuclear delivery system.

Perhaps more important was the official's claim that there was "no feasible way to introduce controls comparable in effectiveness to those of the MTCR into the world aircraft market." It was argued that this market had existed for decades with "an annual trade in the tens of billions of dollars."²⁰

INITIAL PROBLEMS WITH THE MTCR (1987-1989)

Although the negotiation of the MTCR was a success in itself, several problems with this new approach for restraining missile proliferation quickly became apparent after its announcement. These issues severely undermined the effectiveness and credibility of the MTCR and called into question the regime's future viability. Several events drew attention to these problems.

In the winter of 1987-1988, revelations about Argentina's projected 800-1,000 km-range Condor II rocket program drew attention to serious problems regarding the lax enforcement of the guidelines by several member states in Western Europe. In short, it became apparent that numerous West European firms were supplying technology and expertise to this purported space launch program, despite several of their governments' membership in the MTCR.²¹ The situation was exacerbated by the informal and voluntary nature of the regime and each member's individual responsibility for enforcing the guidelines through their own national export controls. Some analysts argued that this problem resulted from the regime's lack of a mechanism—similar to the International Atomic Energy Agency (IAEA) in the nuclear nonproliferation field—to ensure the consistent

interpretation and enforcement of the regime's guidelines by each member state. However, given that the MTCR was negotiated in secret as a voluntary arrangement, the establishment of such an intrusive agency was clearly not a realistic option during the negotiations. The absence of such an agency meant that the member states retained a great deal of flexibility in interpreting the guidelines. The Condor project also demonstrated that the regime's membership was not cast wide enough within Europe, because states such as Sweden and Switzerland had transferred technology and assistance to Argentina outside of the regime. The situation was complicated further by the involvement of Egypt and Iraq. In July 1988, American intelligence revealed that the ultimate goal of the Argentine project was to provide Iraq and Egypt with 200 missiles each. The project was referred to in Egypt and Iraq as the Badr-2000.²²

Implementation problems were not confined to the regime's West European partners. It became evident in 1988 that the United States was experiencing difficulties in implementing policy in conjunction with the MTCR. These problems focused primarily on the State Department's role as the coordinator of MTCR issues "among the involved US agencies."²³ An official from the Pentagon said U.S. inter-agency meetings did not help the Department of Defense implement the MTCR because they tended to focus on "philosophical rather than case discussions."²⁴ ACDA officials thought the meetings had a "mixed record in deciding issues." Furthermore, an official from the Commerce Department said that although the meetings were good for communi-

cating information between agencies, substantive decisions were never reached. In January 1989, another Pentagon official said he had been trying for two years without success "to have Commerce control rocket propellant batch mixers under the MTCR."²⁵

The final issue of concern was the regime's failure to address the missile proliferation activities of China and the Soviet Union. The latter dominated the trade in complete missile systems during the 1970s and 1980s by transferring Scud-B, Frog, and SS-21 missiles to the developing world, primarily to Arab countries in the Middle East. The official American explanation for omitting Moscow from the negotiations was that the best course of action would be to negotiate the regime with its closest allies, with the intention of asking other countries like the Soviet Union to join later.²⁶ This decision was supposedly dictated by the complexity of such negotiations. A more probable explanation, however, was the U.S. perception that Moscow would not have been interested in—and even would have been hostile towards—such negotiations, because Moscow reaped significant economic and political rewards from its ballistic missile exports. Moreover, the negotiations had been initiated prior to 1985, during a period of major hostility in the U.S.-Soviet relationship when the atmosphere had not been conducive to cooperation.

China became a country of significant proliferation concern in March 1988, when it was revealed that Beijing had entered the missile suppliers market by exporting 2,700 km-range DF-3 intermediate-range ballistic missiles (IRBM) to Saudi

Arabia.²⁷ It also emerged in 1988 that China had developed the 600 km-range M-9 and the 280 km-range M-11 ballistic missiles for the export market during the 1980s.²⁸

The omission of both China and the Soviet Union contributed to the perception in Beijing and Moscow that the regime was directed against their economic and security interests; they saw themselves as targets of—rather than as potential partners with—the new regime. Moreover, the viability of the regime was called into question because of its failure to include the world's foremost missile supplying countries. However, the MTCR was originally intended to be a discriminatory regime and to require good behavior for states to join. In the late 1980s, neither the Soviet Union nor China fit the bill.

The MTCR member states began redressing these problems at various levels in 1988. At the first-ever MTCR policy group meeting in September 1988, members placed an emphasis on the need to restrain the Condor II project, despite the fact Argentina claimed it was designed for launching civilian satellites. At the Rome meeting, the participants also discussed Brazil's Sonda sounding rocket program and Israel's Jericho-2 project.²⁹ In addition, the Reagan administration engaged both Moscow and Beijing in separate talks on missile nonproliferation in 1988.³⁰ But these efforts achieved only limited success because Moscow and Beijing were making substantial monetary, and to a lesser extent political, gain from proliferating in missile technology. Consequently, both countries viewed the MTCR as discriminating against their economic and security interests.

Just two and half years after the

official launch of the MTCR, then, the regime appeared to be in crisis and its future effectiveness in doubt. In large measure, the problems resulted from a lack of consensus among the member states regarding the seriousness of the ballistic missile threat and consequently the nature of the response.

INSTITUTIONALIZING AND ENHANCING THE MTCR (1989-1993)

The need for reform became more evident after 1989 as the G-7 states witnessed the complete transformation of their external security situation. This occurred as a result of the demise of the global Soviet nuclear and conventional military threat and the emergence of a new paradigm of security concerns. This paradigm was characterized instead by a growing number of threatening regional aggressors potentially armed with WMD and ballistic missiles. Iraq's use of modified Scud missiles against American forces and allies during the 1991 Gulf War was a potent sign of this growing missile threat. Moreover, missile technology continued to proliferate at a relatively rapid rate between 1989 and 1993. Among other developments: China transferred M-11 technology to Pakistan; news emerged of Israeli collaboration with South Africa to develop a medium-range rocket; North Korea was developing the 1,000 km-range Nodong-1 and was also exporting Scud-B and -C missiles to Iran and Syria; and India had begun testing the projected 2,500 km-range Agni.

In response to the regime's internal enforcement problems and the rapidly changing strategic environment, the Bush administration and the U.S. Congress acted to institutional-

ize and enhance the MTCR between 1989 and 1993. These reforms generated controversy in several MTCR member countries, including the United States, because they entailed significant bureaucratic and systemic obstacles.

Institutionalization and Selective Expansion

Shortly after taking office, the Bush administration began emphasizing the need to include all of the remaining European Community (EC) states in the MTCR by the end of 1992, when the community's internal trade barriers were scheduled for removal.³¹ The administration was concerned that unless all of these countries joined, the community's MTCR participants might not be able to prevent exports of technology to the community's non-regime members, from whose territory controlled items might be transshipped to projects of concern. By January 1993, the regime had been expanded to include 15 more countries, all of which were relatively like-minded liberal democratic states that shared the common goal of nonproliferation. The new members included the remaining EC countries—Belgium, Denmark, Greece, Ireland, Luxembourg, the Netherlands, Portugal, Spain, as well as Austria, Australia, Finland, New Zealand, Norway, Sweden, and Switzerland.³²

The Bush administration institutionalized the regime by persuading America's partners to increase coordination and cooperation by establishing a system of regular plenary and technical meetings to address common issues and problems. This effort was initiated in the face of reluctance on the part of some member governments to hold technical

meetings or to establish a group to discuss annex issues.³³ The exchange of information and opinions between members was facilitated by the establishment of a permanent MTCR point of contact in Paris.³⁴ In addition, the administration persuaded the other members to evaluate the annex to ensure that it included all relevant missile-related goods and technologies. A technical working group was established with the objective of strengthening and updating the annex. When the members examined each other's missile technology control lists; they concluded that they were not controlling the same items on a consistent basis.³⁵ It was apparent, therefore, that the details of the annex needed to be clarified so all the participants agreed on what exactly was controlled by the regime: including what constituted "production facilities," a term that had not been defined in the original guidelines.³⁶ Indeed, this concept has remained a problem until the present day.

By January 1993, the regime's equipment and technology annex had been revised and updated in response to technological developments and previous definitional problems. Moreover, the regime's coverage had been expanded to include missiles capable of delivering all WMD, in order to reflect increased concern over chemical and biological weapons proliferation. The focus of the MTCR thus became the "intention" of potential recipients, regardless of the range and payload of the missile systems in question.³⁷

Enhancing Nonproliferation Export Controls

In addition to institutionalization, the Bush administration acted to en-

hance missile technology export control systems in the United States and certain other member states. For example, the administration pressured and assisted Italy and West Germany to improve their export control systems following revelations about both countries' lax enforcement of the regime's guidelines. This problem had contributed to several high profile cases of missile proliferation to South America and the Middle East, including exports of technology and assistance to Argentina and Iraq.³⁸ The laxity was fed by trade policies and mechanisms that favored export promotion over export control. The situation highlighted a lack of political will to prevent lucrative transfers of technology and assistance at a time when East-West tensions and export controls were being relaxed, and the threat posed by proliferation had still to be fully appreciated.

In the United States, the administration acted to resolve problems symptomatic of America's rapidly changing security situation. These difficulties centered on the need to reform the country's export controls as they were being refocused: away from restricting strategic trade with the Soviet bloc and towards preventing proliferation. Several failures of the Commerce Department's procedure for processing export license requests for dual-use items with potential ballistic missile applications—most notably for exports destined to Iraq—illustrated these problems.³⁹ The major problem involved the department's lack of legal authority to stop exports of technology for reasons of missile proliferation unless an item was included on the MTCR annex. Indeed, the exports to Iraq illustrated that the annex could not possibly include all items with po-

tential missile applications.

The administration acted to resolve this systemic problem with its Enhanced Proliferation Control Initiative (EPCI) of December 1990. The EPCI required American exporters to obtain licenses for "any export destined for a publicly-listed company, ministry, project, or other entity" that was engaged in missile or CBW "activities of proliferation concern." Licenses were also required if an exporter "knew," or was informed by the government, that a "proposed export may be destined to a project of concern," copying a similar provision already in place in the nuclear field.⁴⁰ It should be noted that the EPCI was implemented only after an interagency dispute over the desirability of imposing enhanced unilateral export controls on missiles and CBW technologies. Commerce initially opposed the initiative because its unilateral nature was deemed to pose too great a threat to the commercial competitiveness of U.S. companies, as their foreign counterparts would not be subject to the same controls. This opposition reflected the conflicting dual mandate of the Commerce Department as both export controller and promoter. After the Gulf War, however, the administration began encouraging other MTCR members to adopt comparable EPCI-type controls.⁴¹

The Bush administration was not alone in wanting to strengthen the MTCR. In November 1990, Congress enacted a new law requiring the U.S. government to impose sanctions automatically on American or foreign persons, companies, or any other entities that participated in MTCR-prohibited activities.⁴² Congress had acted to strengthen the MTCR in this way because it was

felt the regime was ridden with flaws. One of the most prominent was deemed to be its lack of an enforcement agency and the resultant situation in which each member state was responsible for enforcing its own commitments. Congress was especially concerned about the role that companies from several MTCR member states had played in supplying technology and assistance to the Condor II project.

Congress perceived the new authority as the best way to insert "teeth" into the regime. The inability of the executive branch to treat missile nonproliferation issues in isolation from commercial and other foreign policy interests contributed to the administration's opposition to the new authority. The administration fought the measure by citing the need to maintain flexibility in U.S. foreign policy and to balance competing national interests.⁴³ However, strong bipartisan support for missile nonproliferation initiatives in Congress made it possible to enact a punitive sanctions law without getting caught up with the wider commercial and other foreign policy considerations involved.

In an attempt to allay some of the administration's concerns, the new law incorporated several provisions dictating the circumstances in which sanctions could be imposed. For example, the U.S. president was prohibited from imposing sanctions if another member had authorized the export, transfer, or trading activity in question. This was included because of concerns regarding the possible extra-territorial nature of the provision. However, this exception did not apply if the activity in question had occurred through fraud or misrepresentation.⁴⁴ Despite the

administration's opposition to the law, it subsequently used it in an attempt to gain nonproliferation pledges from non-regime suppliers (including Israel, China, and Russia).

Controlling Space Launch Technology Exports

Export requests for space launch technology were the source of further controversy between and within certain member states. The Bush administration persuaded the French government not to approve the transfer of rocket engine technology to both the Indian and Brazilian space launch programs because of the potential diversion of this technology to ballistic missile development. Both countries had a history of diverting technology and know-how from the civilian sector to military programs. For example, Brazil had previously diverted civilian rocketry to the development of its MB/EE and SS series of ballistic missiles. Moreover, Brazil's strategic technology and weapons supplier relationship with countries like Iran and Iraq raised the possibility that such technology might be diverted to a third country.⁴⁵

France had previously adopted a liberal attitude regarding the export of space launch technology to non-regime members, arguing that the regime should not prevent transfers of space launch technology to what it perceived as peaceful space launch projects.⁴⁶ However, this view clashed with the U.S. administration's policy of tightly restricting such exports to non-regime countries because of the inherent proliferation risks associated with space launch technology.

The controversy over space launch technology was not confined

to America's bilateral relationship with France. The U.S. State and Defense Departments clashed over the administration's treatment of export requests for space launch technology to ostensibly "peaceful" programs in the developing world. For example, while State deemed the importation of rocket casings from Brazil for heat treatment as consistent with the administration's missile nonproliferation policy, the Pentagon viewed it as a clear violation. Under pressure from State, the administration deemed it appropriate to re-export seven rocket casings back to Brazil despite that country's dubious nonproliferation record. State claimed the complete revocation of the original export license would have severely damaged U.S.-Brazilian relations and weakened the position of President Collor, who favored nonproliferation and wanted to improve relations with Washington.⁴⁷

In response to concern in the Pentagon and Congress that this incident had weakened the MTCR—because Washington appeared not to have lived up to the standards it demanded from the other members—the administration informed its partners that its policy of restraint regarding the export of SLV technology had not changed.⁴⁸ The State Department released an unclassified "non-paper" which reviewed the administration's policy towards the spread of missile and space launch technology. State asserted that all future licensing agreements for the heat treatment of rocket casings in the United States had been revoked.⁴⁹ Moreover, the department said the administration's missile nonproliferation policy had not changed as a result of the Brazilian transfer, and it continued to emphasize restraint in exporting both missile and space launch tech-

nology.

The Pentagon responded by commissioning a report from the RAND Corporation to explore the cost-effectiveness of indigenously developing SLVs.⁵⁰ The audience was intended to be "missile nonproliferation policy analysts and planners in the United States and other countries, as well as foreign governments" that were "pursuing or planning to pursue space launch programs."⁵¹ The report gave two reasons why the United States and other countries should not assist emerging launch programs. First, the report claimed it was not possible to safeguard SLV programs against the transfer of technology to ballistic missile development. Second, the Brazilian program was used as a case study to illustrate the "miserable" economics of developing a viable SLV capability. In doing so, it was asserted that countries like Brazil would not be able to recoup their development costs from the space launch business. The risk would then exist that these countries would be tempted to sell this technology to recover lost capital.⁵² The administration successfully used this logic to persuade Taiwan and South Korea to suspend their space launch projects. It was also used in the effort to persuade Argentina to end its Condor II program.⁵³

Negotiating the Adherence of Non-Regime Suppliers to MTCR Guidelines

The regime's continued omission of several key missile technology suppliers/holders led the Bush administration to pursue a strategy that tied progress in the missile nonproliferation field with progress on other issues in Washington's bilat-

eral relations with China, Israel, and the Soviet Union, and subsequently Russia.

The administration's initial dialogue with the Soviet Union proved relatively successful because of the role "new thinking" had begun to play in Moscow's foreign and defense policy.⁵⁴ The administration's most notable achievement was gaining the Soviet Union's adherence to the MTCR guidelines in June 1990.⁵⁵ Five months later, however, the Russian Space Agency signed an agreement to supply cryogenic rocket engines and the associated production technology to the Indian Space Research Organisation (ISRO). Although Moscow publicly viewed the deal as consistent with its pledge to adhere to the MTCR, the administration perceived it as a clear violation. This difference of opinion resulted in the deterioration of the administration's missile nonproliferation dialogue with Moscow.⁵⁶

Although Russia pledged its adherence to the MTCR following the dissolution of the Soviet Union, Glavkosmos and Russia's KB Salyut design bureau continued with the deal to supply the Salyut-designed cryogenic technology to the Indian SLV program. As a result, the U.S. administration imposed sanctions on the Russian and Indian entities and subsequently linked Russia's entry into the satellite launch market, and its participation in the international space station, to the termination of the ISRO deal.⁵⁷ However, this approach did not produce any concrete results during the final months of the Bush presidency, primarily because of the strength of Russia's military-industrial complex, which did not want to jeopardize its freedom to

export space launch technology and tactical missiles.⁵⁸

The U.S. administration succeeded in persuading Beijing in 1992 to provide the United States with a written pledge that it would observe the MTCR's guidelines. This achievement followed more than two years of diplomatic wrangling over missile nonproliferation issues with Beijing, which had been complicated by the deterioration of U.S.-China relations following the events of Tiananmen Square in 1989. In part, the administration won this pledge by lifting sanctions imposed on Chinese entities for transferring M-11 missile technology to Pakistan.⁵⁹ However, the Chinese adopted such an ambiguous stance on missile nonproliferation that the administration was never really sure where it stood with Beijing on this issue. This confusion stemmed from the recurring gap between words and deeds in China's approach towards missile nonproliferation. This gap, in turn, resulted from the country's fragmented political-military system and the ability of Chinese weapons export/import entities—which were responsible for selling missile technology—to function with relative impunity.⁶⁰ The situation was exacerbated by the Chinese leadership's disagreement with U.S. claims that the M-11 exceeded the regime's parameters. The administration claimed that if the M-11's warhead were reduced in size, the missile's range could be increased to over 300 km, and still retain its capability to deliver a payload of more than 500 kg.

In the Middle East, the United States gained Israel's adherence to the MTCR by threatening to impose sanctions on those Israeli entities in-

involved in transferring missile technology to South Africa and by threatening to curtail America's defense-related business with other Israeli firms. The unique nature of the U.S.-Israeli strategic relationship meant that Israel risked sacrificing its military edge vis-à-vis its Arab neighbors if it did not adhere to the regime's guidelines.⁶¹ The South Africans were not so lucky. The U.S. government imposed two-year sanctions on the Armaments Corporation of South Africa (ARMSCOR) for receiving rocket technology from Israel.⁶² The administration subsequently applied pressure on Pretoria to terminate its SLV program because it was perceived to constitute too much of a proliferation risk. Washington also confronted South Africa with the poor economics of developing a commercially viable SLV when the launch market was already dominated by proven rockets.

Increased Effectiveness

By January 1993, the regime's effectiveness had been enhanced considerably. Its members were meeting regularly to discuss common issues of concern, the annex had been revised and updated, and the export control systems and compliance of several member states, including the United States, had been enhanced. In addition, the guidelines had been expanded to cover missiles capable of delivering all WMD to reflect increased international concern with CBW proliferation. The regime's expansion to include 22 countries had also gone some way towards promoting a missile nonproliferation norm.

As a direct result of these developments, several projects targeted by

the regime had been delayed or canceled. Argentina announced the termination of the Condor II project in 1990, largely because of the embargo that was placed on technology transfer to Argentina by the MTCR member states and diplomatic pressure from the United States.⁶³ By January 1993, the regime's embargo on Brazil's space launch and missile programs had succeeded in restricting considerably the country's access to the technology needed to complete the VLS and to develop the MB/EE and SS series missiles.⁶⁴ Israel had also been persuaded to end its missile development work with South Africa. Moreover, despite the ultimately unsatisfactory nature of the administration's dialogue with China and Russia, both countries had ceased exporting complete ballistic missile systems in violation of the MTCR. Indeed, North Korea remained the only country that was still prepared to export complete systems in violation of the regime. Although this highlighted the relative success of the MTCR, it also illustrated a major weakness. The regime could not prevent determined proliferators from providing missile technology and assistance. Pyongyang continued exporting Scud-B and -C missiles and the related production technology and components to Iran and Syria, despite the U.S. administration's imposition of sanctions against North Korean, Iranian, and Syrian entities.⁶⁵ Because North Korea was isolated internationally and subject to a comprehensive embargo, MTCR members had little chance of persuading Pyongyang to forego its missile sales, especially when they constituted a major source of income.

PROMOTING THE MISSILE NONPROLIFERATION NORM (1993-PRESENT)

While the preceding phase was distinguished by the institutionalization and selective expansion of the regime, the 1993-1997 period has been characterized by the member states' acceptance that they can no longer depend solely on the effectiveness of their own export controls in their efforts to restrict missile proliferation. Accordingly, the member states have begun to place greater emphasis on getting key missile technology suppliers/holders to join the regime or to adhere to its guidelines. This approach has resulted in the regime's expansion to incorporate several past proliferators, including Argentina, Brazil, Russia, and South Africa. In addition, China and Ukraine have signed bilateral agreements with the United States in which they have agreed to adhere to the MTCR's guidelines. The above memberships have proven controversial because all of these countries were once targeted by the regime. In particular, controversy has focused on the methods used by the Clinton administration to entice countries such as Brazil to sign up.

Relaxing the MTCR to Attract Key Suppliers

In September 1993, the Clinton administration relaxed U.S. criteria for admitting new members. In doing so, U.S. policy changed to support the "prudent expansion" of the regime to include additional countries that "subscribe to international nonproliferation standards, enforce effective export controls, and abandon offensive ballistic missile programs."⁶⁶ Under the new policy, prospective members were not re-

quired to forfeit their civilian rocket programs to join the regime. While it remained American policy not to support the development or acquisition of SLVs by non-regime countries, the United States began to consider exports of MTCR-controlled items to member countries for peaceful programs on a case-by-case basis. Once inside the regime, new members became eligible to receive MTCR-controlled space launch technology from the United States and other members. In short, the new policy encouraged prospective members to subscribe to the missile nonproliferation norm by giving up their "offensive" long-range missile programs, in return for preserving their right to develop "peaceful" rockets (in part, by acquiring the relevant components, technology, and assistance from other MTCR members). This arrangement resembled the trade-off between military and civilian nuclear programs made by countries when they sign the NPT as non-nuclear weapon states.

According to one Clinton administration official, the "overall goal" of the new policy was to encourage countries such as Brazil, Russia, and South Africa, and perhaps even India and Israel, to join the regime by offering U.S. space launch technology as an incentive.⁶⁷ However, the policy also sought to strike a balance between commercial and proliferation concerns; it was designed to enhance the regime's effectiveness by adding new members, but at the same time promoting the competitiveness of American firms by easing restrictions on the trade in space launch technology.⁶⁸

This new approach proved controversial because it contradicted prior U.S. policy in this area. Previously,

the United States had adopted a general presumption to deny exports of all MTCR-controlled items, even to regime members.⁶⁹ This policy was based on the fact that much of the technology used to develop and manufacture SLVs is virtually identical with that used for ballistic missiles. In the fall of 1993, several U.S. Congressmen spoke out against the new policy. Senators John McCain and Jeff Bingaman argued that the new policy would undermine American efforts to restrict missile proliferation.⁷⁰ Representative John Kyl went further when he said it posed "potentially disastrous" results for the security of the United States and its allies.⁷¹ Indeed, some argued that the MTCR was turning into a "missile supermarket" where prospective members would be encouraged to join the regime in order to develop and build larger rockets.

Engaging Key Suppliers

Although the policy change occurred too late for Argentina to retain some form of SLV when it joined the MTCR in 1993, Brazil was allowed to keep its Veiculo Lancador de Satellites (VLS) project when it joined in 1995.⁷² By abandoning its offensive missile programs, enacting export-control legislation, and adhering to nonproliferation norms, Brazil became eligible to import space launch technology from the other MTCR members to develop a rocket that was once a primary target of the regime. Indeed, the MTCR embargo had brought the VLS program to a virtual standstill by restricting Brazil's access to the advanced technologies, expertise, and investment it needed to complete development of the rocket.⁷³ This was despite reports that Brazil had managed previously to acquire guidance technol-

ogy from Western Europe, Russia, and the United States via the black market.⁷⁴

South Africa joined the regime shortly before Brazil. In contrast, Pretoria had terminated its SLV program two years previously. Two reasons were given. First, to allay fears that South Africa was working on ballistic missiles and to open the way for the country's membership in the MTCR; this promised to increase the country's access to sensitive dual-use and weapons-related materials. Second, the South African government had determined that developing an SLV was not economically viable. Pretoria had determined that in comparison to existing launchers in the commercial market, the manufacture of satellite boosters in South Africa "would not be the most economical option."⁷⁵ The Bush administration had confronted South Africa with the exact same reason for terminating its launch program. Indeed, the success of this case appeared to legitimize the previous administration's approach of applying diplomatic pressure to convince countries like South Africa that their long-term economic and political interests are better served by foregoing space launch programs.

Russia also joined the regime in 1995. This occurred as a result of more than four years of bilateral wrangling between the United States and Russia. After taking office, the Clinton administration had continued the Bush strategy of linking Russia's entry into the commercial satellite launch market and its participation in the international space station with its adherence to the MTCR and the resolution of the ISRO issue in a manner consistent with U.S. policy. This strategy paid off within six

months, when the Russian government agreed to scale back the Indian deal by transferring just the engines and not the associated production technology. This paved the way in September 1993, for Russia's agreement to abide by MTCR guidelines. Simultaneously, the United States signed an agreement with Russia that provided for the latter's entry into the commercial satellite launch market.⁷⁶

The Clinton administration subsequently announced its formal support for Russia's membership in the regime in 1995 after resolving concerns regarding past Russian sales to India and Brazil.⁷⁷ The administration was so keen to get Moscow to join that it had waived sanctions against Russia and Brazil following the former's transfer of SLV-related technology to the latter. Administration officials claimed the sanctions were waived because Moscow promised to cease such transfers in the future.⁷⁸ According to the State Department, the decision to support Moscow's membership was also based on Russia's establishment of an export control system capable of enforcing the regime's guidelines.⁷⁹ A special exception was then made to allow Moscow to join without relinquishing its offensive long-range missile arsenal.

Russia was not the only former post-Soviet republic to pose a missile proliferation challenge for the United States. Ukraine inherited a sizeable chunk of the Soviet aerospace industry. This included facilities for producing SS-18 and SS-24 ICBMs and Zenit and Cyclone SLVs. Ukraine also inherited an arsenal of Scud-B missiles. Consequently, the United States accorded priority to gaining Ukraine's adher-

ence to and future membership in the MTCR because of the potential for proliferation from this country. This policy resulted in Ukraine's formal agreement with the United States in 1994 to adhere to the regime's guidelines.⁸⁰ Since that time, Kyiv has actively sought membership in the MTCR. In 1996, however, doubt was cast on Ukraine's intention and/or ability to enforce the regime's guidelines effectively when it was revealed that China was attempting to acquire SS-18 ICBM-related technology from Ukraine.

The Clinton administration concluded a similar agreement with China, but, again, concerns remain. In 1994, the administration agreed to lift sanctions it had placed on Chinese entities over the M-11 sales to Pakistan. In return, China agreed not to export surface-to-surface missiles "featuring the primary parameters of the MTCR."⁸¹ Beijing also agreed to the U.S. position on the issue of "inherent capability." This held that any missile capable of generating "sufficient energy to deliver a 500 kg payload at least 300 km, regardless of its demonstrated or advertised combination of range and payload" is covered by the MTCR. In addition, the Clinton administration agreed to hold "in-depth discussions" on the MTCR with Beijing, and even signaled its intention to promote eventual Chinese membership.⁸²

Beyond Supply-Side: The Regional Approach

In addition to bringing key technology suppliers/holders into the regime and negotiating the adherence of others to the guidelines, the member states began to place an emphasis on addressing the missile proliferation problem at the regional

level. The importance of approaching this issue from the demand-side was highlighted by the failure of the regime's supply-side approach to stop determined proliferators such as India, Iran, Iraq, Israel, North Korea, Pakistan, Syria, and Taiwan. Furthermore, the MTCR did nothing to mitigate the destabilizing effects of proliferation after the fact in key regions of tension.

Israel and India had progressed the furthest in the missile and space launch fields because both started developing rockets long before the MTCR was announced and therefore had benefitted from access to Western technology before it was cut off. This put them in an advantageous position once the MTCR took effect because they subsequently managed to develop indigenously much of the technology embargoed by the regime. As recently as March 1997, Indian Prime Minister Deve Gowda said that—despite an earlier government report to contrary—the country's Agni IRBM program had *not* been terminated.⁸³ Moreover, India conducted a successful test of the 250 km-range version of its Prithvi missile on February 1997.⁸⁴ It should be noted, however, that India's missile program would have progressed much further by now if it had not been subject to an MTCR embargo.

The regional approach began to take account of the inability of supply-side policies to address adequately the missile proliferation problem in the developing world. Approaches considered by the member states included confidence-and-security-building measures (CSBMs) such as the creation of missile-free zones and the establishment of missile flight-testing restric-

tions and notifications in regions such as South Asia and the Persian Gulf.⁸⁵ One important issue with a regional dimension was identified as the transshipment of missile technology through non-MTCR countries such as Cyprus, Dubai, Hong Kong, Malta, and Singapore. These countries had been targeted by determined and innovative proliferators because of the large volume of trade that passes through them without entering the local economy. The member states agreed to give key non-MTCR transshippers practical assistance to implement transshipment controls on missile technology. Indeed, the United States hosted a seminar on transshipment issues in 1996 that was attended by foreign policymakers and specialists from several member states and seven non-MTCR countries.⁸⁶

It should be noted that in 1995 the member states reportedly reached a consensus against proposals to establish a global treaty to ban ballistic missiles with specific ranges.⁸⁷ Canada had proposed the idea of a treaty to ban all ballistic missiles with ranges of between 300 and 5,500 km.⁸⁸ Moreover, the U.S. ACDA examined options for globalizing the Intermediate-Range Nuclear Forces (INF) Treaty to ban ballistic missiles with ranges between 500 and 5,500 km.⁸⁹ Although the global concept continues to retain some support in the United States and elsewhere, the idea appears to have been rejected because of a lack of support. Indeed, the support of the declared nuclear powers would have been essential for the success of this approach, although it is unlikely this would have been forthcoming. For example, it is difficult to imagine China supporting the idea because the majority of its ballistic missile force is land-based

and falls between the proposed 300 and 5,500 km restrictions. If China had not supported the idea, then India and subsequently Pakistan would have come out against it, and so on.

By rejecting the global approach, the MTCR chose instead a regional approach for addressing the problem on the demand-side. It could be argued that this approach offered a significant advantage because CSBMs—such as missile-free zones—can be tailored specifically to address the unique security dilemmas of regions like the Persian Gulf and South Asia.

But other significant problems remain for the MTCR as it moves into its second decade. In particular, it is worth examining in greater detail recent information regarding existing problem countries as well as new technological issues likely to pose future difficulties for the regime.

PROBLEM STATES AND FUTURE TECHNOLOGICAL CHALLENGES

Russia

Moscow's ability and/or intention to enforce its MTCR commitments effectively has recently been cast into considerable doubt. In late 1995, gyroscopes and accelerometers designed for Russian-made submarine-launched ballistic missiles were intercepted in Jordan en route to Iraq.⁹⁰ An investigation by the Clinton administration later determined that the Russian government had not "sanctioned" the transfer and the components had been smuggled out of the country.⁹¹ In January 1997, it was revealed that components, production technology, and plans for the 2,000 km-range SS-4 missile had been transferred from Russia to

Iran.⁹² More recently, the chairman of the Russian Duma's Defense Committee revealed that eight Scud-B launchers and 24 to 32 missiles were illegally transferred from Russia to Armenia in May and June 1996.⁹³ Finally, it has emerged that Russia continued transferring rocket engine technology to India in 1993 after its agreements with the United States to refrain from doing so. This reportedly resulted in the completion of 60 to 80 percent of the transfers to India.⁹⁴

Although the Russian government has denied involvement in these incidents, at the very least they raise serious questions regarding the viability of Russia's export control system and its current and future ability to live up to its MTCR commitments. Furthermore, these incidents raise the question of what should be done if this type of activity is allowed to continue, especially when much of it has involved Category I systems and technology.

China

Several recent revelations have continued to draw attention to Beijing's ambiguous stance on missile nonproliferation. A recent CIA report said that China had provided the ballistic missile programs of Iran and Pakistan with "a tremendous variety of assistance" in the second half of 1996.⁹⁵ Indeed, it was revealed in August 1996 that—despite earlier sanctions—China had continued to provide blueprints, technology, and equipment to help Pakistan build an M-11 missile factory.⁹⁶ Pakistan's test-firing of the projected 600 km-range Hatf III missile in July 1997 provided further evidence of China's assistance to Islamabad. It has even been speculated since the

test that the Hatf III might have been a Chinese M-9 missile.⁹⁷

China views American missile nonproliferation policy and the MTCR as hypocritical because the United States is by far the world's biggest exporter of conventional arms. In contrast, China's share of the world arms market is relatively small. Beijing has criticized the MTCR because it covers missiles, which China exports, but not aircraft, which the United States and its allies export.⁹⁸ In November 1995, Lia Huaqiu, China's Vice Minister of Foreign Affairs, said:

Ballistic missiles *per se* are not weapons of mass destruction, but rather a carrier vehicle. Likewise, fighter aircraft are also a carrier vehicle that can carry nuclear, biological, and chemical weapons.... Limiting missile exports without limiting fighter plane exports is clearly a double standard.⁹⁹

Moreover, Beijing views the transfer of military technology—including missile technology—as a means for realizing strategic goals, for increasing its diplomatic influence, and for paying for defense modernization. Bates Gill and Matthew Stephenson have argued that Beijing is "unlikely to abandon" these policies "without a fundamental reevaluation" of how well they serve China's broader interests.¹⁰⁰ With China's energy requirements likely to spiral in the future, missile technology sales to oil-rich countries like Iran threaten to take on greater strategic significance for Beijing in the future.

North Korea

North Korea continues to present the MTCR with a two-pronged challenge: domestic production and ex-

ports. Pyongyang continues to develop the 1,000 km-range Nodong-1 missile, which will be capable of targeting neighboring countries such as South Korea and Japan. North Korea is also attempting to develop the 1,500 km-range Taepodong-1 and the projected 4,000 km-range Taepodong-2 ballistic missiles.¹⁰¹ However, Pyongyang's desperate economic situation suggests that these research programs are likely to have difficulty crossing several technological thresholds: multi-staging, advanced guidance and control systems for extended-range flight, and thermal shielding required for re-entry vehicles. This situation highlights the relevance of MTCR efforts to shut down any possible supply network that might provide these technologies to North Korea.

The Clinton administration, like the Bush administration before it, however, has been unable to stop Pyongyang from exporting its current technologies to states of concern, despite imposing sanctions on the recipient parties. For example, Egypt received Scud-B technology and spare parts from North Korea in 1996.¹⁰² The United States has little chance of persuading Pyongyang to forego its missile sales through the imposition of largely symbolic sanctions, especially when these sales constitute a major source of hard currency. The Clinton administration recognized this problem in April 1996 when it engaged Pyongyang directly on the issue during talks in Berlin.¹⁰³ North Korea subsequently canceled a test of the Nodong-1 in November 1996, reportedly under American pressure.¹⁰⁴

The United States is now seeking North Korea's adherence to the

MTCR guidelines, as well as the termination of the Nodong and Taepodong missile programs.¹⁰⁵ Given similar bilateral dialogues between the United States and other proliferating countries in the past, the administration will certainly link the successful resolution of the missile issue to progress in other areas of U.S.-North Korean relations, such as the relaxation of economic sanctions. For several reasons—including Pyongyang's submarine incursion into South Korean waters, the famine currently gripping the North, and several high profile defections from the DPRK—progress has been severely hampered over the past 18 months.

South Korea and Ukraine: The Next Members?

The prospective memberships of Ukraine and South Korea have attracted great interest in recent months. Several issues will need to be resolved, however, before either country is given the green light to sign up.

Kyiv's membership aspirations have been hampered by its refusal to accept the U.S. position that new members forfeit their offensive missiles. Although Ukraine is not required to give up its SLV capabilities, the administration wants Kyiv to give up its inventory of Scud-B missiles for nonproliferation reasons.¹⁰⁶ The administration's concerns appear to be well-founded, given reports in December 1996 that certain Ukrainian entities had been implicated in a deal worth an estimated \$500 million to sell Libya either SS-21 or Scud-B missiles.¹⁰⁷

Ukraine also refuses to give up its right to develop new missiles with

ranges of 300 to 500 km. Ukrainian President Leonid Kuchma said in May 1997 that Ukraine would continue manufacturing and modernizing surface-to-surface missiles with maximum ranges of 300 to 500 km. Moreover, Ukraine's security chief Vladimir Gorbulin said Ukraine had provided the United States with guarantees only that it would not sell such systems or the related technology.¹⁰⁸ Under the INF Treaty, Kyiv is only obliged not to develop, test, and deploy ground-launched missiles with ranges of between 500 and 5,500 km.¹⁰⁹ However this deadlock is overcome, an underlying political dimension will need to be addressed involving Ukraine's desire to join the MTCR on the same terms as Russia without sacrificing more than what is required under INF and START.

South Korea is currently attempting both to extricate itself from a Memorandum of Understanding (MOU), which it negotiated with the United States in 1979, and to join the MTCR. Under the MOU, Seoul agreed to refrain from developing missiles with ranges in excess of 180 km. The limit was perceived as the longest range required by South Korea to adequately defend itself. In return, South Korea secured access to U.S.-origin components and technology for the program.¹¹⁰

The abrogation of the understanding and South Korea's membership in the MTCR would allow Seoul to develop missiles with ranges up to 300 km and payloads up to 500 kg. Seoul has obvious reasons for doing this, which stem from its vulnerability to North Korea's current and potential missile arsenal. Also, Seoul complains that the progress of its civilian rocket program has been restrained by the MOU. The United

States is wary of terminating the understanding, despite Seoul's desire to prove its nonproliferation credentials by joining the MTCR. Washington wants Seoul to maintain the transparency of its missile program and is concerned about the potentially negative reaction in Beijing, Pyongyang, and Tokyo if South Korea begins developing missiles that could threaten them in the future.¹¹¹

According to one South Korean official, the two sides have "reached a broad consensus" that Seoul should be permitted to develop offensive missiles with ranges up to 300 km and commercial rockets with no limits. However, it has been reported that Seoul has yet to agree to America's demand for total transparency in its missile program.¹¹² Thus, although U.S. support could help lead Seoul into full MTCR membership, the current delay in its acceptance into the regime is likely to continue until Seoul commits itself to the more restrictive guidelines on its military programs being pressed by the United States.

Cruise Missile Proliferation

In addition to these country-specific challenges, the MTCR will need to act more deliberately in the future to restrict the proliferation of long-range cruise missiles. NIE 95-19 estimated that by 2005 "several countries, including some hostile toward the United States, probably will acquire land-attack cruise missiles (LACMs) with ranges of hundreds of kilometers." The estimate even said that an attack against the continental United States by a developing country using air- or ship-launched cruise missiles would be "technically feasible" by that date.¹¹³

The relatively small size of cruise

missiles and their variable flight profiles make them difficult to defend against. In addition, cruise missiles could potentially be fitted with satellite navigation technology, which would give developing countries the ability to deliver conventional and unconventional payloads with much greater accuracy than any ballistic missile they currently possess. For these reasons, and because the unit production cost for cruise missiles is much lower than that for ballistic missiles, some analysts have argued that long-range LACMs could eventually overtake ballistic missiles as the delivery system of choice for so-called "rogue" states. According to Dennis Gormley, more than 70 countries already deploy over 75,000 anti-ship cruise missiles, many of which could be modified into land-attack variants with the inclusion of satellite navigation technology.¹¹⁴

Although the MTCR is designed to restrict the spread of WMD-capable cruise as well as ballistic missiles, the technology and components used to develop and produce the former are more widely available. This is because of the widespread availability of anti-ship cruise missiles and because cruise missiles are in effect pilotless aircraft. When considered with the fact that countries like China and Russia are developing advanced cruise missiles and will likely export them in the future, it seems that the future horizontal proliferation of WMD-capable long-range cruise missiles is inevitable.

How the MTCR responds to this development will have a significant influence on the future emergence of the threat. Scott McMahon and Dennis Gormley suggest that because low-technology cruise missiles have already widely

proliferated, the MTCR should target "critical enabling technologies" needed to develop and produce sophisticated versions capable of high speed and/or long range. According to McMahon and Gormley, the most notable enabling technologies include stealth technology and advanced propulsion systems, which are produced almost exclusively by MTCR members and are included in Category II of the annex. They also recommend that the United States should act to raise the awareness of the other members regarding the latent cruise missile threat in order to develop a consensus within the MTCR on the need to control those technologies critical to the development of advanced cruise missiles.¹¹⁵ However, it would appear that until cruise missile proliferation poses more of a tangible threat to the forces, allies, and/or territory of a significant number of MTCR members, including the United States, the consensus required to enhance controls in this area might not be forthcoming soon. But one needs only to consider the effect of Iraq's ballistic missile attacks during the 1991 Gulf War to appreciate the importance of "external shocks" in generating the consensus necessary for tightening export controls on certain types of military technology.

CONCLUSION

Despite an inauspicious start during the period from 1987 to 1989, there can be little doubt that the MTCR has since had a significant effect in restraining the horizontal spread of long-range ballistic missile capabilities especially in the developing world. This has largely been due to the regime's success in driving up the costs associated with mis-

sile proliferation. First, it has made proliferation more expensive by limiting the availability internationally of complete ballistic missile systems as well as the key components, subsystems, manufacturing technology, and technical expertise vital to the development and manufacture of ballistic missiles. Second, the regime's expansion to include 29 diverse nations has promoted progress towards establishing the concept of a missile nonproliferation "norm." This norm has helped to drive up the political costs of proliferating for those countries determined to acquire a ballistic missile capability or enhance existing systems.

Summarizing the current situation in the missile field, Aaron Karp observed in a recent article that the MTCR has in most instances succeeded in limiting the ballistic missile programs of countries like Iran, Iraq, and North Korea to technology derived from the Soviet-origin Scud surface-to-surface missile and/or the SA-2 surface-to-air missile.¹¹⁶ It is difficult to disagree with Karp's supposition that this situation will persist for the foreseeable future. Indeed, a recent DIA report appeared to support this analysis when it said that the ballistic missiles most likely to proliferate "in significant numbers" are Scud upgrades.¹¹⁷ According to Karp, only Brazil, Israel, and India managed to progress beyond this Scud barrier because their rocket programs were initiated well before the MTCR was established and they benefited from access to Western technology and assistance for several years before it was cut off.¹¹⁸

In situations where ballistic missile technology has already widely proliferated, the regime's recent pro-

motion of demand-side approaches to the problem could help to ameliorate the destabilizing effects of current arsenals in key regions of tension. These approaches could be promoted as elements of broader efforts in specific regions designed to reduce tensions between potential belligerents. Indeed, this approach would constitute a logical and realistic step forward in the regime's fight against proliferation.

However, if the regime is to continue restricting proliferation, it is imperative that the member states act to address the continued leakage of missile technology and assistance from three principal sources: China, North Korea, and Russia. North Korea presents the most intractable challenge because of its international isolation. Indeed, it is difficult to prescribe an alternative course of action in this situation beyond persisting with the current dialogue between Washington and Pyongyang. With China and Russia, the member states could draft a revised formula of positive and negative incentives to encourage the Chinese and Russian governments to enforce their respective commitments vis-à-vis the regime more effectively. In doing so, both countries should be persuaded that their long-term self-interests—in economics and security—are best served by strengthening their export controls and preventing lucrative but destabilizing transfers to countries of proliferation concern.

¹ President's Summary of DCI National Intelligence Estimate 95-19 (PS/NIE 95-19), "Emerging Missile Threats to North America During the Next 15 Years," November 1995, displayed on

the Federation of American Scientists' homepage at <http://www.fas.org/spp/starwars/offdocs/nie9519.htm>.

² See: Rowan Scarborough and Bill Gertz, "Missile-Threat Report 'Politicized' GOP Says," *The Washington Times*, January 30, 1996, pp. A1, A14.

³ President's Summary of NIE 95-19.

⁴ United States General Accounting Office, *Foreign Missile Threats: Analytical Soundness of Certain National Intelligence Estimates*, GAO/NSIAD96-225 (Washington, D.C.: United States General Accounting Office, August 1996). Also see: Bill Gertz, "Pentagon Missile Study Faulted," *The Washington Times*, September 12, 1996, p. A7.

⁵ *NIE 95-19: Independent Panel Review of "Emerging Missile Threats to North America During the Next 15 Years,"* unclassified version of the report sent to The Honorable Arlen Specter, Chairman of the Select Committee on Intelligence, United States Senate, Washington, D.C., December 23, 1996. Displayed on the Federation of American Scientists' homepage at <http://www.fas.org/irp/threat/missile/oca961908.htm>. Congress had directed the Director of Central Intelligence to review the underlying assumptions of NIE 95-19. The director was required to have the review conducted by an independent non-governmental panel of individuals with appropriate expertise and experience.

⁶ United States Arms Control and Disarmament Agency, *Arms Control 1980* (Washington, D.C.: United States Government Printing Office, August 1981), p. 27.

⁷ *Nuclear Capable Missile Technology Transfer Policy*, National Security Decision Directive Number 70 (Washington, D.C.: The White House, November 30, 1982).

⁸ See: John H. Cushman, "7 Nations Agree to Limit Export of Big Rockets," *The New York Times*, April 17, 1987, p. A1; John H. Cushman, "Tightening the Reins in Ballistic Missile Race," *The New York Times*, April 19, 1987, p. E2.

⁹ United States Department of State Press Briefing (extract), "Missile Technology Control Regime," April 16 1987, in *Current Documents*, United States Department of State (Washington, D.C.: United States Government Printing Office, 1987) p. 75.

¹⁰ The White House, "Nonproliferation Agreement With Allies," April 16, 1987; in *Weekly Compilation of Presidential Documents* (Washington, D.C.: United States Government Printing Office, April 20, 1987).

¹¹ "Post Cold War Agreements, 1987-1991," in Richard D. Burns, ed., *Encyclopedia of Arms Control and Disarmament, Volume III* (New York: Charles Scribner's Sons, 1993) pp. 1474-1480.

¹² *Current Documents*, p. 75.

¹³ Personal interview with U.S. Government official.

¹⁴ United States Arms Control and Disarmament Agency, *The Missile Technology Control*

Regime: Fact Sheet (Washington, D.C.: United States Arms Control and Disarmament Agency, May 17, 1993) p. 1.

¹⁵ *Current Documents*, p. 76.

¹⁶ Author's interview with U.S. Government official.

¹⁷ See: *The Missile Technology Control Regime: Fact Sheet*, p. 1; and Burns, *Encyclopedia of Arms Control and Disarmament, Volume III*, p. 1475.

¹⁸ *Current Documents*, p. 76.

¹⁹ *The Missile Technology Control Regime: Fact Sheet*, p. 2.

²⁰ *Weekly Compilation of Presidential Documents*, p. 80

²¹ Aaron Karp, "Ballistic Missile Proliferation in the Third World," in *SIPRI Yearbook 1991: World Armaments and Disarmament* (Oxford: Oxford University Press, 1991), p. 327.

²² "Behind the Condor Carbon-Carbon Smuggling Case," *US News and World Report*, July 25, 1988, p. 38.

²³ United States General Accounting Office, *Arms Control: US Efforts to Control the Transfer of Nuclear-Capable Missile Technology*, GAO/NSIAD-90-176 (Washington, D.C.: United States General Accounting Office, June 1990), p. 2.

²⁴ *Ibid.*, pp. 7-8.

²⁵ *Ibid.*

²⁶ *Current Documents*, p. 79.

²⁷ OPR (Riyadh), March 19, 1988; in FBIS-NES-88-054 (21 March, 1988), "Statement on the purchase of Chinese-made missiles."

²⁸ Shirley A. Han and Robert Shuey, *Chinese Missile and Nuclear Proliferation: Issues for Congress*, CRS Issue Brief (Washington, D.C.: Congressional Research Service, The Library of Congress, February 10, 1994), p. 4.

²⁹ See: D. Oberdorfer, "US Seeks to Curb Argentine Missile Project," *The Washington Post*, September 1988, p. A6; "Condor II: Argentina's Mission," *Atlantic News*, September 30, 1988; Deborah A. Ozga, "A Chronology of the Missile Technology Control Regime," *The Nonproliferation Review I* (Winter 1994), p. 74.

³⁰ See: Michael R. Gordon, "US and Soviets Discuss Curbing Missile Exports," *The New York Times*, September 27, 1988, p. A1; "Shultz, in China, Urges Talks on Curbing Spread of Missiles," *The Washington Post*, July 15, 1988, p. A15; "Chinese Missiles Sold in MidEast Worrying Shultz," *The New York Times*, July 16, 1988, p. A1; T. Luard, "American Defence Chief Aims to Curb Peking Rocket Sales," *The Daily Telegraph*, September 6, 1988; "China Snubs US Over MidEast Arms Sales," *Financial Times*, September 7, 1988.

³¹ Ozga, "A Chronology of the Missile Technology Control Regime," p. 75.

³² *Ibid.*, p. 71.

³³ Testimony of Elizabeth Verville, Deputy Assistant Secretary of State for Politico-Military Affairs, before the Joint Economic Committee of the United States Congress, September 21, 1990, in *Arms Trade and Nonproliferation*, hearings before the Subcommittee on Technology and Na-

tional Security, Joint Economic Committee of the United States Congress, 101st Congress, 2nd Session, 102nd Congress, 1st Session, September 21, 1990 and April 23, 1991 (Washington, D.C.: United States Government Printing Office, 1992) p.42.

³⁴ See: Ozga, "A Chronology of the Missile Technology Control Regime," p. 77; "Canada Hosts MTCR Meeting," *Disarmament Bulletin*, No. 14 (Fall 1990), p. 27.

³⁵ Testimony of James LeMunyon, Deputy Assistant Secretary for Export Administration, Department of Commerce, before the Joint Economic Committee of the United States Congress, September 21, 1990, in *Arms Trade and Nonproliferation*, pp. 38-39.

³⁶ Testimony of Henry Sokolski, Deputy for Nonproliferation Policy, Department of Defense, before the Joint Economic Committee of the United States Congress, September 21, 1990, in *Arms Trade and Nonproliferation*, pp. 41-42.

³⁷ "US Broadens Missile Controls," *Export Control News*, January 28, 1993, pp. 2-3.

³⁸ For example see: Kenneth R. Timmerman, *The Poison Gas Connection: Western Suppliers of Unconventional Weapons to Iraq and Libya*, a special report sponsored by the Simon Wiesenthal Center, 1990, pp. 1-54.

³⁹ For example see: Gary Milhollin, *Licensing Mass Destruction: US Exports To Iraq 1985-1990* (Washington, D.C.: Wisconsin Project On Nuclear Arms Control, June 1991); Bureau of Export Administration, United States Department of Commerce, "CONSARC Chronology," September 7, 1990, in *Arms Trade and Nonproliferation*; hearings before the Subcommittee on Technology and National Security, Joint Economic Committee of the United States Congress, 101st Congress, 2nd Session, 102nd Congress, 1st Session, September 21, 1990 and April 23, 1991 (Washington, D.C.: United States Government Printing Office, 1992); Committee on Government Operations, United States House of Representatives, *Strengthening the Export Licensing System*, Report 102-137, 102nd Congress, 1st Session, July 2, 1991 (Washington, D.C.: United States Government Printing Office, July 2, 1991), p. 18.

⁴⁰ See: Office of the Press Secretary, The White House, December 13, 1990, *Fact Sheet on Enhanced Proliferation Control Initiative*, pp. 1-2; and David Silverberg, "US Arms Proliferation Proposal Will Rise or Fall on World Support," *Defense News*, December 17, 1990, pp. 4, 36.

⁴¹ "White House Statement on Weapons of Mass Destruction," March 7, 1991, in *Public Papers of the Presidents of the United States: George Bush 1991*, Book 1: January 1-June 30, 1991 (Washington, D.C.: United States Government Printing Office, 1992), p. 223.

⁴² Sanctions imposed for Category I violations are more stringent than those for Category II violations. Depending on the seriousness of the violation, sanctions imposed include various combinations of the following: denial of certain

or all types of U.S. export licenses; denial of certain or all import rights into the U.S.; and denial of certain or all contracting rights with the U.S. government. See: "Title XVII: Missile Technology Controls, National Defense Authorization Act for Fiscal Year 1991," Public Law 101-510, 101st Congress, 1st Session, November 5, 1990, *United States Statute at Large 1990* (Washington, D.C.: United States Government Printing Office, 1991), pp. 1389-2352.

⁴³ See: Michael R. Gordon, "Clash Erupts on Ways to Halt Spread of Missiles," *The New York Times*, November 1, 1989, p. A10; and David Silverberg, "MTCR Proposals Expected To Ignite Friction In Congress, Among Allies," *Defense News*, September 4, 1989, pp. 31-32.

⁴⁴ *United States Statutes at Large 1990*, pp. 1389-2352.

⁴⁵ See: Wyn Bowen and Andrew Koch, "Nonproliferation is Embraced by Brazil," *Jane's Intelligence Review* (June 1996), pp. 283-287.

⁴⁶ See: David Silverberg, "French Proposal May Violate Pact on Proliferation," *Defense News*, July 17, 1989, pp. 4, 52; Paris Domestic Service (Paris), July 17, 1989; in JPRS-TAC-89-030 (26 July 1989), "Negotiations with France to Buy Ariane Rocket Engine Technology"; Michael, R. Gordon, "US Tries To Stop Brazil's Missile Technology Deal," *The New York Times*, October 19, 1989, p. A6; Statement by Senator Jeff Bingaman on the floor of the Senate, October 7, 1989; "French Technology Transfer to Brazil in Violation of the MTCR," *Congressional Record*, Senate, October 7, 1989, Volume 135, Number 134 (Washington, D.C.: United States Government Printing Office, October 7, 1989), pp. S12992-12995.

⁴⁷ Testimony of Elizabeth Verville, Deputy Assistant Secretary of State for Politico-Military Affairs, before the Joint Economic Committee of the United States Congress, September 21, 1990, in *Arms Trade and Nonproliferation*, pp. 44-45.

⁴⁸ Erik Wemple, "Fighting An Uphill Battle: Missile Technology Export Controls," *Export Control News*, October 25, 1990, p. 10.

⁴⁹ United States Department of State, *US Heat Treatment of Brazilian Rocket Casings* (Washington, D.C.: United States Department of State, December 24, 1990).

⁵⁰ Written response to a question posed to Henry Sokolski, Deputy for Nonproliferation Policy, Department of Defense, Senate Committee on Governmental Affairs, October 9, 1990. *Proliferation and Regional Security in the 1990s*, hearing before the Committee on Governmental Affairs, United States Senate, 101st Congress, 2nd Session, October 9, 1990 (Washington, D.C.: United States Government Printing Office, 1991), p. 84.

⁵¹ Brian Chow, *Emerging Space Launch Programs-Economics and Safeguards* (Santa Monica: The RAND Corporation, 1993), p. iii.

⁵² *Ibid.*, pp. 1-67.

⁵³ Henry Sokolski, *Ending South Africa's Rocket Program: A Nonproliferation Success* (Washington, D.C.: Nonproliferation Policy Edu-

cation Center, undated).

⁵⁴ For example, see: William C. Potter and Adam Stulberg, "The Soviet Union and the Spread of Ballistic Missiles," *Survival* XXXII (November/December 1990), p. 548.

⁵⁵ "Soviet-United States Joint Statement On Nonproliferation," June 4, 1990, *Public Papers of the Presidents of the United States: George Bush 1990*, Book 1: January 1-June 30, 1990 (Washington, D.C.: United States Government Printing Office, 1991), pp. 768-771.

⁵⁶ Andrew Lawler, "US Sanctions Target Indian, Russian Programs," *Space News*, May 11-17, 1992, pp. 1, 28.

⁵⁷ Richard Boucher, Deputy Spokesman, Office of the Assistant Secretary/Spokesman, United States Department of State, *Russian Sale of Rocket Engines to India* (Washington, D.C.: United States Department of State, May 11, 1992); Andrew Lawler, "US Sanctions Imposed; Indian Deal With Russia Still On," *Space News*, May 18-24, 1992, p. 14.

⁵⁸ For an examination of U.S.-Russian relations vis-a-vis the MTCR see: Charles C. Peterson, "Moscow, Washington, and the Missile Technology Control Regime," *Contemporary Security Policy* 16 (August 1995).

⁵⁹ See: "Imposition of Missile Proliferation Sanctions Against Chinese and Pakistani Entities," *Federal Register*, Volume 56, Number 137 (Washington, D.C.: United States Government Printing Office, July 17, 1991), p. 32601; Office of the Press Secretary, The White House, June 16, 1991, *Fact Sheet: China Trade*, pp. 1-2.

⁶⁰ See: John Lewis, Hua Di, Xue Litai, "Beijing's Defense Establishment: Solving the Arms-Export Enigma," *International Security* 15 (Spring 1991), p. 97.

⁶¹ Jon B. Wolfstahl, "Israel Accepts MTCR Guidelines," *Arms Control Today* 21 (November 1991), p. 20; "Israel, Pressed By US, Puts Limits On Its Export Of Missiles," *The Washington Post*, October 4, 1991, p. A21.

⁶² Office of the Secretary of Politico-Military Affairs, United States Department of State, "Missile Proliferation and ARMSCOR," *Federal Register*, Volume 56, Number 199 (Washington, D.C.: United States Government Printing Office, October 15, 1991), pp. 51734-51735.

⁶³ Aaron Karp, "Ballistic Missile Proliferation," *SIPRI Yearbook 1991: World Armaments and Disarmament* (Oxford: Oxford University Press, 1991), p. 327.

⁶⁴ Wyn Q. Bowen, "Brazil's Accession to the MTCR," *The Nonproliferation Review* III (Spring-Summer 1996), p. 87.

⁶⁵ See: "Imposition of Missile Proliferation Sanctions Against North Korean and Iranian Entities," *Federal Register*, Volume 57, Number 67 (Washington, D.C.: United States Government Printing Office, April 7, 1992), pp. 11767-11768; "Imposition of Missile Proliferation Sanctions Against North Korean and Syrian Entities," *Federal Register*, Volume 57, Number 130 (Washington, D.C.: United States Government Printing Office, July 7, 1992), pp. 29924-

29925.

⁶⁶ In response to proliferation concerns, the new policy provided for "additional constraints or safeguards" to be included with such transfers if they were deemed necessary to ensure the technology was not misused. Office of the Press Secretary, The White House, *Fact Sheet: Nonproliferation and Export Control Policy* (Washington, D.C.: The White House, September 27, 1993).

⁶⁷ Ben Iannotta and Andrew Lawler, "Gore To Mediate Missile Dispute," *Space News*, September 20-26, 1993, pp. 4, 21. Also see: Andrew Lawler, "US Lawmakers Look to Intensify Missile Export Limits," *Defense News*, October 4-10, 1993, p. 34.

⁶⁸ Philip Finnegan, "Clinton Export Plan Draws Fire," *Defense News*, October 10, 1993, pp. 1, 36.

⁶⁹ Jon B. Wolfstahl, "President Clinton Unveils New Non-Proliferation Export Policies," *Arms Control Today* 23 (November 1993), p. 22.

⁷⁰ Ben Iannotta and Andrew Lawler, pp. 4, 21.

⁷¹ Andrew Lawler, "Lawmakers Rap Clinton's Policy on Missile Sales," *Defense News*, October 4, 1993, pp. 3, 34.

⁷² United States Department of State, *Missile Technology Control Regime Holds Plenary Meeting in Bonn* (Washington, D.C.: United States Department of State, October 12 1995); "MTCR Expands," *Arms Sales Monitor*, December 5, 1995, p. 4

⁷³ See: Wyn Bowen and Andrew Koch, "Non-proliferation is Embraced by Brazil," *Jane's Intelligence Review* (June 1996), p. 286; and Bowen, "Brazil's Accession to the MTCR," pp. 88-89.

⁷⁴ Jose Casado, *O Estado De Sao Paulo* (Sao Paulo), April 30, 1995, p. A4; in FBIS-TAC-95-003 (30 April 1995); EFE (Madrid), May 5, 1995; in FBIS-TAC-95-003 (5 May 1995); EFE (Madrid), April 30, 1995; in FBIS-TAC-95-003 (30 April 1995).

⁷⁵ See: R.F. Botha, *Space Industry In South Africa*, Press Release Number 22/93 (New York: Permanent Mission of South Africa to the United Nations, June 30, 1993); Reuter, June 30, 1993; in Executive News Service, June 30, 1993, "South Africa Abandons Independent Program." In 1992, South Africa had attempted to give its space launch efforts more legitimacy by giving responsibility for the program to Denel (Pty) Ltd. Denel was established in April 1992 by regrouping most of the subsidiaries of the Armaments Corporation of South Africa (ARMSCOR). *The Denel Group: Denel Corporate Profile*, Denel (Pty) Ltd, PO Box 8322, Hennopsmeer, 0046, Republic of South Africa, p.1.

⁷⁶ Andrew Lawler, "Russians OK Missile Export Control," *Space News*, September 6, 1993, p. 6; Pavel Vanichkin, Itar-Tass (Moscow), September 2, 1993; in FBIS-SOV-93-169 (2 September 1993).

⁷⁷ Theresa Hitchens, "US Backs Russia in MTCR," *Defense News*, July 17-23 1995, p. 12.

⁷⁸ "US Waives Russia-Brazil MTCR Violation,"

Arms Control Today 25 (July-August 1995), p. 27.

⁷⁹ Prepared Statement Of The Honorable Thomas E. McNamara, Assistant Secretary Of State Bureau Of Political-Military Affairs, Senate Banking, Housing, And Urban Affairs Committee, Subcommittee On International Finance And Monetary Policy, September 21 1995; *Federal News Service*, September 21 1995, pp. 1-6.

⁸⁰ R. Jeffrey Smith, "Ukraine Agrees to follow Missile Control Treaty," *The Washington Post*, May 14, 1994.

⁸¹ Michael McCurry, Office of the Spokesman, United States Department of State, August 25, 1991, *China/Pakistan: M-11 Missile Sanctions*.

⁸² Office of the Spokesman, United States Department of State, October 4, 1994, *Joint United State-People's Republic of China Statement On Missile Proliferation*.

⁸³ For example, see: "India Pledges Support for Agni Program," *Current Missile News* (March 1997) (<http://www.cdiss.org/97march1.htm>).

⁸⁴ For example see: "India Tests Prithvi SRBM," *Current Missile News* (February 1997) (<http://www.cdiss.org/97fed2.htm>).

⁸⁵ United States Department of State, *Missile Technology Control Regime Holds Plenary Meeting in Bonn* (Washington, D.C.: United States Department of State, October 12 1995); "MTCR Expands," *Arms Sales Monitor*, December 5, 1995, p. 4; The White House, *Press Release: Text Of A Letter From The President To The Speaker Of The House Of Representatives And The President Of The Senate* (Washington, D.C.: The White House, November 12, 1996) (<http://library.whitehouse.gov>).

⁸⁶ White House Press Release, November 12, 1996.

⁸⁷ Shirley A. Kan, *Chinese Proliferation of Weapons of Mass Destruction: Current Policy Issues*, CRS Issue Brief (Washington, D.C.: Congressional Research Service, The Library of Congress, April 14, 1997), p. 14.

⁸⁸ "Canada Calls For Ballistic-Missile Ban," *International Defense Review*, June 1995, p. 5.

⁸⁹ See: Theresa Hitchens, "ACDA Promotes Worldwide Ban On Midrange Missiles," *Defense News*, July 4-10, 1994, p. 16; Dennis Gormley, "Global INF Treaty Poses Hidden Risk," *Defense News*, September 5, 1995, pp. 43-44.

⁹⁰ "Back to Baghdad, Part 3: Armed and Dangerous," transcript of *CNN Presents*, February 25, 1996, pp. 2-3.

⁹¹ "Technology Smuggled," *Jane's Defense Weekly*, June 26, 1996, p. 6.

⁹² Robin Wright, "Russia Warned On Helping Iran Missile Program," *The Los Angeles Times*, February 12, 1997 (<http://www.latimes.com>).

⁹³ See: *Sovetskaya Rossiya*, April 3, 1997, p. 3, in FBIS-SOV-97-067 (3 April 1997); Pyotr Yudin, "Sales Cast Doubt On Russia's Arms Control," *Defense News*, April 14-20, 1997, pp. 4, 26; Nikolai Novichkov, "Russia Details Illegal Deliveries to Armenia," *Jane's Defence Weekly*, April

16, 1997, p. 15.

⁹⁴ "Russia and Missile Proliferation," statement by Richard H. Speier (Independent Consultant on Proliferation) before the Subcommittee on International Security, Proliferation, and Federal Services of the Committee on Governmental Affairs, United States Senate (Washington, D.C.: Committee on Governmental Affairs, United States Senate, June 5, 1997).

⁹⁵ Paul Mann, "China Alleged Top Trafficker of Mass Destruction Weapons," *Aviation Week and Space Technology*, August 4, 1997, pp. 42-43.

⁹⁶ R. Jeffrey Smith, August 25, 1996, p. A1.

⁹⁷ See: "Pakistan Missile Firing Triggers Indian Protestes," *Aviation Week and Space Technology*, July 21, 1997, p. 35; *The Telegraph* (Calcutta), July 4, 1997, p.1; in FBIS-TAC-97-187 (8 July 1997); C. Uday Bhaskar, *The Pioneer* (New Delhi), July 7, 1997; in FBIS-TAC-97-188 (9 July 1997).

⁹⁸ Bates Gill and Matthew Stephenson, "Search For Common Ground: Breaking the Sino-US Non-Proliferation Stalemate," *Arms Control Today* 26 (September 1996), pp. 17-18.

⁹⁹ Liu Huaqiu, *Xiandai Junshi (Conmilit)* (Beijing), November 11, 1995; in FBIS-CHI-95-246 (11 November 1995).

¹⁰⁰ Gill and Stephenson, "Search For Common Ground: Breaking the Sino-US Non-Proliferation Stalemate," pp. 17-18.

¹⁰¹ Wyn Bowen, Tim McCarthy, and Holly Porteous, "Ballistic Missile Shadow Lengthens," IDR Extra Special, special supplement to *Jane's International Defense Review*, February, 1997.

¹⁰² Barbara Starr, "CIA Discloses Source Of Egyptian 'Scud-B' Parts," *Jane's Defence Weekly*, July 9, 1997, p. 5.

¹⁰³ Reuter (Berlin), April 21, 1996; in Executive News Service, April 23, 1996, "US Says North Korea Missile Talks To Continue."

¹⁰⁴ Bowen, McCarthy, and Porteous, "Ballistic Missile Shadow Lengthens," p. 2.

¹⁰⁵ Yonhap (Seoul), June 14, 1997; in FBIS-TAC-97-164 (17 June 1997).

¹⁰⁶ Jeff Erlich, "Scud Missile Cache Stymies Ukraine Effort to Join MTCR," *Defense News*, September 30-October 6, 1996, p. 46.

¹⁰⁷ Bill Gertz, "Kiev Imperils US Aid With Libya Arms Deal," *The Washington Times*, December 9, 1996, p. 1.

¹⁰⁸ Interfax (Moscow), May 17, 1997; in FBIS-SOV-97-137 (17 May 1997).

¹⁰⁹ Gary Bertsch and Victor Zaborsky, "Bringing Ukraine into the MTCR: Can US Policy Succeed?" *Arms Control Today* 27 (April 1997), p. 10.

¹¹⁰ See: Theresa Hitchens, "US Enters Talks on South Korean Bid to Quit Missile Pact," *Defense News*, December 11-17, 1995, p. 22. Bowen, McCarthy, and Porteous, "Ballistic Missile Shadow Lengthens," pp. 1-3.

¹¹¹ See: Bowen, McCarthy, and Porteous, "Ballistic Missile Shadow Lengthens," pp. 1-3.

¹¹² Yonhap (Seoul), July 21, 1997; in FBIS-TAC-97-202 (22 July 1997).

¹¹³ President's Summary of NIE 95-19.

¹¹⁴ Dennis Gormley, "Employ Joint Task Force To Tackle US Counterforce Gap," *Defense News*, July 14-20, 1997, p. 15.

¹¹⁵ K. Scott McMahon and Dennis Gormley, *Controlling the Spread of Land-Attack Cruise Missiles* (Marina del Rey, CA: American Institute for Strategic Cooperation, January 1995), p. 82.

¹¹⁶ Aaron Karp, "The New Politics of Missile Proliferation," *Arms Control Today* 26 (October 1996), p. 11.

¹¹⁷ Paul Mann, "China Alleged Top Trafficker in Mass Destruction Weapons," *Aviation Week and Space Technology*, August 4, 1997, pp. 42-43.

¹¹⁸ Karp, "The New Politics of Missile Proliferation," p. 11.