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**Theater Missile Defense and the
Anti-Ballistic Missile (ABM) Treaty: Either–Or?**

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Theater Missile Defense and the Anti-Ballistic Missile (ABM) Treaty: Either Or?*

Colonel Dennis L. Danielson

Introduction

On the night of 25 February 1991 an Iraqi Scud missile penetrated Patriot missile defenses and slammed into the U.S. barracks in Dhahran, Saudi Arabia, killing twenty-eight U.S. personnel.¹ Throughout the duration of the war Iraqi missiles terrorized Israel in an attempt to lure it into the war. Despite the low accuracy of the Scuds and the fact they did not significantly threaten the allied forces, they nevertheless forced the allies to expend time and energy on missile defenses and preparedness for the possibility of chemical attack behind the front line.

In a broader sense though, the potential impact of Iraq's missiles was far greater. If Iraq had succeeded in getting Israel to retaliate, the allied coalition most likely would have broken and the final outcome of the war would have fallen far short of the actual outcome. Iraq might have retained a sizable armed force and weapons program. (It was not until after the war that UN inspectors discovered Iraq's nuclear and chemical weapons program was more fully developed than had been assumed possible.) Foreseeing the potential break in the coalition, U.S. forces expended significant resources to locate and destroy the Iraqi missile threat. However, despite this effort, Iraq continued to launch missiles up to the very end of the war although the overall launch rate decreased. It seems this unsophisticated "straw" missile almost broke the coalition "camel's" back. Iraq was not deterred from launching missiles despite the obvious capability of the allied coalition to inflict a crippling blow on Iraq.

As a result of the Gulf War, the Department of Defense (DOD) has increased its emphasis on theater missile defenses (TMD) with the goal of building more capable TMD systems to counter threats the United States is likely to face in future theater wars. In support of this aim, the United States began discussions with Russia regarding the Anti-Ballistic Missile (ABM) treaty. The purpose of these discussions is to clarify the boundary between strategic missile defenses, which are limited by the treaty, and tactical and theater ballistic missile defenses, which are not limited by the treaty.

Will this effort to clarify the ABM Treaty undermine the purpose of the treaty? Exactly what capabilities does the United States need for theater missile defense? Does the ABM Treaty still serve a purpose or is it outdated? Can we have both TMD and the ABM Treaty? To what extent should the United States engage in cooperative TMD efforts with allies, Russia, or other states?

To answer these questions I will first review the historical factors that brought us the ABM Treaty as well as the purpose and results of the treaty. This discussion will also summarize several significant events that have occurred since the treaty was ratified in 1972. The purpose of this review is to place the treaty in proper context and to establish a base for an analysis of current negotiations in the light of past events. Since the current treaty negotiations concern the demarcation between the strategic defenses the treaty was designed to limit and others that are permitted, I will begin by reviewing the reasons for and purpose of the ABM Treaty. Without this understanding we might find ourselves undoing the past without wanting to do so.

Second, I will discuss the likely threat the United States will face in the near future from theater ballistic missiles. This discussion will also include an analysis of efforts to control the proliferation of ballistic missiles and weapons of mass destruction. Third, I will discuss current U.S. plans to develop effective TMD systems and the concerns that these systems might have a negative impact on the ABM

* The views expressed in this article are those of the author and do not reflect the official policy or position of the Department of Defense, the U.S. Government, or the U.S. Air Force.

¹. "Patriot Missile Defense," *GAO Report to the Chairman, Subcommittee on Investigations and Oversight, Committee on Science, Space, and Technology, House of Representatives* (Washington, D.C.: U.S. General Accounting Office, February 1992), GAO/MTEC-92-26, p. 1.

Treaty. Finally, I will conclude with recommendations to resolve these concerns and at the same time meet the growing threat of theater ballistic missiles.

Historical Factors Related to the ABM Treaty

The historical factors that are pertinent to our discussion of the ABM Treaty can be traced from the end of World War II through the Cold War that followed.

The Cold War and the ABM Treaty

On 6 August 1945 the United States dropped the world's first nuclear weapon on Hiroshima. The U.S. decision to use the bomb was based on the desire "to make a profound psychological impression on as many of the inhabitants as possible" with the hope its use would end the war.² On 9 August 1945 the second atomic bomb was dropped on Nagasaki. Japan surrendered less than a week later. Approximately one hundred thousand people died and another one hundred ten thousand were injured out of a combined total population of four hundred fifty thousand in the cities of Hiroshima and Nagasaki.³ Though staggering, the number of casualties at Hiroshima and Nagasaki as a result of the atomic bomb were less for Japan and for the United States than if other military strategies were used to end the conflict. A single, conventional Tokyo air raid on 10 March 1945 resulted in the deaths of more than one hundred thousand people alone.⁴ Based on the "fight to the death" reputation of Japanese soldiers throughout the Pacific theater, the United States expected that Japan was capable of enduring and inflicting many more deaths if the war was to continue as it had been fought to that point. With this perspective in mind, use of the atomic bomb seemed an acceptable choice to President Harry Truman.

While it ended one war, the nuclear bomb took us into another, the Cold War. The 1950s and 1960s were characterized by a seemingly endless expansion of U.S. and Soviet strategic military capability. From the atomic bomb, the hydrogen bomb, and intercontinental ballistic missiles (ICBMs), to sea-launched ballistic missiles (SLBMs), tactical nuclear weapons, and multiple independent reentry vehicles (MIRVs), the development of new and more effective offensive weapons and programs to build defenses and counter defenses seemed to go on without end.

In the midst of this expansion in offensive capability, the USSR sought to extend the influence of communism by significant increases in foreign aid and arms exports throughout the world. Although most countries who received Soviet foreign aid did not adopt the Leninist idea of a revolution of the masses or embrace the ideology of communism, most were eager to receive Soviet arms and supported at least some of the aims and goals of the USSR. Soviet foreign policy was almost exclusively structured to counter the influence and threat perceived as coming from Washington (and to a lesser degree a competition from Beijing in Asia).

When the United States improved relations with Pakistan, Iran, and Iraq in 1954 and 1955, the Soviet Union responded with foreign aid to Egypt, India, and Afghanistan. American influence in Israel and Jordan was met with Soviet assistance to Syria and Yemen. The Soviets attempted to take advantage of every failure in American foreign policy. With Fidel Castro's successful revolution in Cuba in 1959, the USSR gained an open door into America's backyard.

During the 1960s and 1970s, Soviet aid was used to cultivate opposition to the United States and its policies throughout Latin America by supporting activities in Argentina, Brazil, Chile, Mexico, Nicaragua, Peru, and Uruguay. When the U.S. relationship with Turkey was strained as a result of the 1964 crisis in Cyprus, the Soviets were quick to respond by befriending Turkey. Though sidelined during the 1967 six-day Israeli-Arab war and somewhat embarrassed by the dismal performance of

². Vincent C. Jones, *Manhattan, the Army and the Atomic Bomb* (Washington, D.C.: U.S. Government Printing Office, 1985), p. 532.

³. *Ibid.*, p. 547.

⁴. William Craig, *The Fall of Japan* (New York, N.Y.: Dial Press, 1967), p. 25.

Soviet equipment in that conflict, the USSR wasted no time in rearming the Arab states to the tune of \$2.5 billion in 1967 and 1968, almost as much as had been given during the previous twelve years.⁵

Also during the 1960s and early 1970s the Soviets provided additional foreign aid to India and, on occasion to Pakistan, as a way to counter U.S. (and Chinese) influence. Though seemingly not concerned about the growing U.S. involvement in Southeast Asia in the early 1960s, the USSR increased its supply of foreign aid and weapons to North Vietnam in 1965 and openly supported the North Vietnamese Army and the Vietcong throughout the war. When African states broke free from colonial rule in the 1960s and early 1970s, the USSR sought to take advantage of every opportunity. Soviet aid went to support instability in Zaire and Nigeria in the 1960s and in Somalia, Angola, Ethiopia, Zimbabwe, Namibia, and South Africa in the 1970s. Overall Soviet arms sales went from \$500 million a year in 1955 to \$5 billion a year in 1965.⁶

The rapid post-World War II expansion of strategic weapons, the clash of east-west ideology at numerous points throughout the world, and the growing threat of a major nuclear conflict, spurred efforts in the United States and in the USSR to develop civilian and national defenses. The concern about nuclear war felt by people in the United States during the late 1950s led many to build backyard fallout shelters. Schools instituted periodic air raid drills during which children were taught to crawl under their desks and to shield their eyes from the expected flash of the nuclear burst. Both countries conducted research and development to find effective ways to defend against a missile attack and each made advances in technology to counter the expected defenses of the other (the United States development of the MIRV for example). Although the United States established an early lead in the development of nuclear weapons, the Soviets did not remain far behind; both sides acquired huge nuclear arsenals of ICBMs, SLBMs, and long range bombers.

As each side worked on development and anticipated deployment of a national anti-ballistic missile (ABM) defense system, it became increasingly clear these defenses would only be marginally effective because of the superiority of offensive missile technologies, including the use of decoys, MIRVs, and other penetration aids. Namely, deployment of a missile defense system would most likely result in still further increases in offensive strategic weapons in order to counter those missile defenses. Therefore in 1969 the United States and USSR began negotiations to limit ABM defenses as a part of broader Strategic Arms Limitations Talks (SALT) in an acknowledgment that neither party could achieve superiority or lasting security by simply increasing its arsenal of strategic weapons.

On 26 May 1972 President Richard Nixon and General Secretary Leonid Brezhnev signed “The Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems,” more commonly known as the ABM Treaty. This treaty prohibits the United States and the USSR from deploying national ABM systems for a “defense of the territory of its country.”⁷ The treaty did, however, permit a very limited fixed, ground-based ABM system to protect one ICBM field and the nation’s capitol. The 1974 Protocol to the treaty further limits each nation to just one ABM site (either around the capitol or an ICBM field). The treaty defines an ABM system as “a system to counter strategic ballistic missiles . . . currently consisting of ABM interceptor missiles . . . ABM launchers . . . and ABM radars.”⁸ The treaty also prohibits each side from giving non-ABM missiles, launchers, and radars the “capabilities to counter strategic ballistic missiles or their elements in flight” and prohibits testing non-ABM missiles, launchers, and radars “in an ABM mode.”⁹ These restrictions were designed to prevent the treaty from being circumvented by giving other systems an ABM capability.

⁵. Joseph L. Noguee and Robert H. Donaldson, *Soviet Foreign Policy Since World War II* (New York, N.Y.: Macmillan, 1992), p. 194.

⁶. *Ibid.*, p. 175.

⁷. Quote is from Article I of the treaty that reads as follows: 1) Each Party undertakes to limit anti-ballistic missile (ABM) systems and to adopt other measures in accordance with the provisions of this Treaty; 2) Each Party undertakes not to deploy ABM systems for a defense of the territory of its country and not to provide a base for such a defense, and not to deploy ABM systems for defense of an individual region except as provided for in Article III of the Treaty.

⁸. See Article II, paragraph 1 of the ABM treaty.

⁹. See Article VI of the ABM treaty.

In conjunction with the ABM Treaty, the Strategic Arms Limitation Talks (SALT) Interim Agreement was signed by the United States and USSR to freeze the number of ICBM and SLBM launchers. SALT was not subject to ratification as a treaty because it was intended to be a short term agreement (up to five years) that would be superseded by a permanent treaty to reduce strategic arms.

Significance of the ABM Treaty.

The significance of the ABM Treaty is evident in the preamble that reads: (emphasis added)

The United States and the Union of Soviet Socialist Republics, hereinafter referred to as the Parties, proceeding from the premise that nuclear war would have devastating consequences for all mankind, *considering that effective measures to limit anti-ballistic missile systems would be a substantial factor in curbing the race in strategic offensive arms and would lead to a decrease in the risk of outbreak of war* involving nuclear weapons, proceeding from the premise that the limitation of anti-ballistic missile systems, as well as certain agreed measures with respect to the limitation of strategic offensive arms, *would contribute to the creation of more favorable conditions for further negotiations on limiting strategic arms*, mindful of their obligations under Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons, *declaring their intention to achieve at the earliest possible date the cessation of the nuclear arms race* and to take effective measures toward reductions in the strategic arms, nuclear disarmament, and general and *complete disarmament*, desiring to contribute to the relaxation of international tension and the strengthening of trust between States,

Have agreed as follows: . . .

As stated in this preamble, *the goal of the treaty was to halt the race to produce more strategic weapons (missiles) by limiting defenses against such weapons*. The United States had gone from a 1950s and 1960s nuclear strategy based on superiority to one based on the acceptance of eventual parity, a strategy that became known as Mutually Assured Destruction (MAD).

The earlier U.S. strategy of superiority had enabled the United States to exercise a strong hand during the 1962 Cuban missile crisis. Air Force crews in nuclear armed bombers sat with engines running ready to respond to any conflict that might develop from a Soviet attempt to penetrate the U.S. blockade of Cuba. The United States won the face-off with the Soviets on the basis of a conventional and nuclear superiority. But by the early 1970s the gap in strategic capabilities between the United States and the USSR had narrowed. Each party had a reasonable degree of confidence that a substantial fraction of its strategic forces could survive the other's first use of nuclear weapons and, therefore, it was of limited utility to defend against such an attack. The United States placed great confidence in its survivable SLBM force augmented by a strategic bomber and tanker force that remained on twenty-four hour alert. The Soviets depended more on their overwhelming superiority in the number of ICBMs in hardened silos.

The second observation to make from the preamble of the ABM Treaty is *both parties acknowledged a commitment and responsibility to reduce and ultimately eliminate their nuclear weapons in accordance with the aims of the Non-Proliferation Treaty (NPT) they signed in 1968*. The ABM Treaty along with the SALT I Interim Agreement was expected to cap the arms race and form the basis for further agreements that would begin to reduce strategic arms.

Results of the ABM Treaty

What did the treaty achieve? What did it fail to accomplish? From the 1970s through the mid 1980s, the Soviet Union increased its support of conflict aimed against the West. In Africa (Angola, Ethiopia); Central and South America (Cuba, Nicaragua); Southwest Asia (Syria, Iraq); South Asia (India); and Southeast Asia (Cambodia, Laos) Soviet aid grew rapidly. The Soviets became the leading world supplier of weapons with military aid over the period from 1978 to 1986 totaling more than \$137 billion.¹⁰ In addition, Soviet military forces were used in a more active role than during the 1950s and 1960s. In 1979 Soviet forces invaded neighboring Afghanistan demonstrating a resolve to commit troops to support socialist regimes against the West.

¹⁰. Ibid., p. 175.

In nuclear technology, the Soviets were not content to achieve parity with the United States. A U.S. Defense Nuclear Agency report published in 1978 compared forty-one different measures of U.S. and Soviet strategic forces from 1960 to 1980. The report showed at the time of the 1962 Cuban missile crisis, the comparison favored the United States by a wide margin. However, by the mid 1970s, the Soviets were ahead in all but eight categories.¹¹ Though some disputed Soviet technology had actually surpassed the United States, no one argued with the fact the Soviets had rapidly closed the gap in the number of offensive weapons. The USSR very quickly duplicated U.S. nuclear technology in almost every area and, similarly, in many areas of conventional weapons as well. Duplication of U.S. technology was especially apparent in the similarity between Soviet and U.S. aircraft.

The ABM Treaty and the Interim Agreement did not halt the increase in the number and capability of strategic warheads. The United States and USSR continued to deploy additional warheads by deploying MIRVs that placed up to ten weapons on one missile. While keeping within the Interim Agreement on overall limits in the number of ICBM and SLBM launch tubes, the goal of limiting or reducing strategic warheads was circumvented. As the Table 1 shows, from 1972 to 1985 the U.S. strategic warhead count went from approximately six thousand to more than ten thousand and the Soviet warhead count went from approximately twenty-one hundred to approximately ten thousand while the total number of delivery systems (ICBM and SLBM launch tubes) remained relatively constant. Each country continued to invest in technologies to improve accuracy, survivability, and reliability of its strategic systems during this period.

The ABM Treaty did have two positive outcomes. First, *the treaty saved the United States the expense of deploying and operating a large national missile defense system.* Both states were limited by the treaty (and the 1974 Protocol) to field only one ground-based ABM site with a maximum of 100 ABM interceptors. The United States initially deployed an ABM system (called Safeguard) near Grand Forks Air Force Base, North Dakota, but shut it down during its first year of operation because of serious concerns about its operational and cost effectiveness. Safeguard depended on an exo-atmospheric (outer space) ABM interceptor called the Spartan and a lower altitude, endo-atmospheric interceptor called the Sprint. Since both the Spartan and Sprint were nuclear tipped, it was highly probable the nuclear effects of a few Spartan warheads would “blackout” the ABM radar and “shoot itself in the foot” so to speak. (Note: The Limited Test Ban was signed in October 1963 by the United States, UK, and USSR to prohibit outer space nuclear tests after it became obvious that other, related nuclear weapons effects

Table 1. Comparison of U.S. and USSR Strategic Systems, 1972 to 1990

	1972	1980	1985	1987	1990
U.S.					
ICBM	1,054	1,054	1,018	1,000	1,000
SLBM	656	656	616	640	624
Bombers	455	338	180	317	306
Warheads*	6,000	7,301	10,174	13,873	9,680
USSR					
ICBM	1,530	1,398	1,398	1,418	1,398
SLBM	500	1,028	979	928	924
Bombers	140	156	170	165	185
Warheads*	2,170	6,000	9,987+	11,044	10,996

Source: Information taken from various issues of *The Military Balance*, published annually by the International Institute for Strategic Studies (Riverside, N.J.: Macmillian, 1990–1991): 212; (1987–1988): 225; (1985–1986): 180; (1990–1981): 3–4,90–91; (1972–1973): 84–85. Numbers used for “bombers” are generally long range bombers. U.S. figures for 1972 and 1980 include FB-111s. U.S. nuclear bomber force increased in 1987 with B-1 and conversion of older B-52 to nuclear ALCM role. Figures do not show relative megatonage. Figures do not agree with other open source information but should be taken as a relative measure of strategic capabilities.

Notes: * Does not include tactical nuclear warheads.

from actual tests had caused serious damage to satellites and global communication systems.) Even if

¹¹. William R. Van Cleave and W. Scott Thompson, *Strategic Options for the Early Eighties*, monograph by National Strategy Information Center, Inc. (White Plains, N.Y.: Automated Graphic Systems, Inc. 1979), p. 5.

all one hundred ABM interceptors worked as advertised, they would hardly protect the United States against thousands of Soviet ICBM and SLBM warheads. After the site was closed as an ABM facility, the long range radar was converted to a missile warning and space surveillance facility and is still in use as of this writing. Unlike the United States, the USSR, however, continued to upgrade and maintain its nuclear tipped ABM system near Moscow.

The second result of the ABM Treaty was it kept the door open for talks to continue on the limitation and reduction of strategic weapons (SALT II, START I and II). In practice, the treaty created the appearance of a willingness to agree to reduce nuclear weapons without either side having to make any real sacrifices. Article XIII of the treaty created a Standing Consultative Committee (SCC) that brought the United States and the USSR together on a regular basis to discuss a wide range of issues concerning the treaty such as clarifications, possible violations, proposed changes, and so forth. The treaty provided a starting point from which it was possible to discuss other negotiations about strategic weapons in general. Although the United States and USSR continued to embrace opposing ideologies for many years, each country remained committed to the belief the ABM Treaty was a worthwhile means to hold the other's strategic defenses in check.

Significant Events Since the ABM Treaty.

As was previously mentioned, the period from the early 1970s to the mid 1980s was a time of unprecedented growth in the export of Soviet weapons and expansion of strategic forces. Ronald Reagan was elected President in 1980 expressing a view shared by many Americans that the USSR was an "evil empire." In light of Soviet actions around the world, Americans were not put at ease by the sustained strategy of MAD and the failure of the United States and the USSR to agree upon any reduction in strategic forces. It was of little comfort to know the United States had no defenses against ICBMs while the Soviets had an ABM system that offered some (although disputably little) protection around Moscow.

Throughout the late 1970s and early 80s both countries had substantial research programs underway to develop technologies that might increase their missile defense capabilities. The United States effort to improve missile defenses came into prominence following a nationally televised speech made by President Reagan on 23 March 1983. In this speech, Reagan announced the start of a major initiative that would have as its aim to field a strategic missile defense system to render ballistic missiles "impotent and obsolete."¹² President Reagan's idea, quickly labeled "Star Wars" by its critics and the press, became the Pentagon's Strategic Defense Initiative (SDI).

As one might expect, the Soviets were quick to express criticism of SDI as impractical, unbelievable, and also a violation of the ABM Treaty. Privately they were probably concerned the United States might in fact have achieved a technical break-through that would let it develop effective defenses and lead to a withdrawal from the ABM Treaty—Article XV of the treaty allows either party to withdraw after a six month advance notice.

As the SDI program got under way, a debate soon developed over what was and what was not allowed by the ABM Treaty. In October of 1985, President Reagan's national security advisor, Bud McFarlane, stated during a nationally televised interview that the President was:

□□ Guided by the ABM Treaty, and the terms of that treaty are very explicit in Articles II, III, IV, and V, plus Agreed Statement D. They make it clear that on research involving new physical concepts, that that activity, as well as testing, as well as development, indeed, are approved and authorized by the treaty. Only deployment is foreclosed, except in accordance with Articles XIII and XIV.¹³

The debate grew into a major political battle among arms control advocates, the administration, Congress, and the Soviets. The traditional interpretation of the treaty (later known as the "narrow

¹². Address to the nation by then-President Ronald Reagan, televised on all major networks, 23 March 1983.

¹³. George P. Schultz, *Turmoil and Triumph: My Years as Secretary of State* (New York, N.Y.: Macmillan, 1993), p. 578.

interpretation”) was that the United States and USSR could not develop, test, or deploy any ABM systems except fixed, ground-based systems. This view is based on Article V that reads in part as:

Article V

1. Each Party undertakes not to develop, test, or deploy ABM systems or components that are sea-based, space-based, or mobile land-based.

In other words, SDI efforts not devoted to fixed, land-based ABM systems were limited to research only.

Mr. McFarlane’s statement challenged this point of view by claiming Agreed Statement D of the treaty (made at the time the treaty was signed) exempted new “exotic” technologies from the traditional interpretation. Agreed Statement D states (emphasis added):

Agreed Statement [D]

In order to insure fulfillment of the obligation not to deploy ABM systems and their components except as provided in Article III of the Treaty, the Parties agree that *in the event ABM systems based on other physical principles and including components capable of substituting for ABM interceptor missiles, ABM launchers, or ABM radars are created in the future*, specific limitations on such systems and their components would be *subject to discussion* in accordance with Article XIII and agreement in accordance with Article XIV of the Treaty.

The view expressed by Mr. McFarlane became known as the “broad interpretation.” Those opposed to the broad interpretation included most of the U.S. team that had negotiated the ABM Treaty.

As the debate grew during the mid-1980s two extremes developed. At one extreme, SDI supporters wanted to press for an aggressive effort to develop and deploy a variety of space-based and ground-based ABM systems with or without the concurrence of the USSR (six month notice is all that is required to withdraw from the treaty). At the other end of the spectrum, SDI opponents ridiculed the notion any such defenses were technically or economically possible and even SDI research would undermine the ABM Treaty. In between these two extremes were those who approved of SDI research and, although skeptical about its potential, wanted to keep options open. Congressional restrictions attached to appropriations bills limited SDI expenditures to only those programs that could be conducted within the narrow or traditional interpretation.

From my analysis of the events that occurred during the 1980s that relate to the ABM Treaty, I identify two points as most important. First, *President Reagan was sincerely motivated by a desire to rid the world of the threat of ICBMs*. He was led to believe SDI research could develop a capability to shield the whole world, including the USSR and not just the United States, from the threat of ballistic missiles. At the Reykjavik conference in October 1986, President Reagan discussed at length a proposal to share strategic defenses and eliminate offensive ballistic missiles *before* deployment of defenses so neither side could have an effective first strike capability.¹⁴ At one point in the discussion, the President expressed his desire to eliminate *all* nuclear weapons.¹⁵ However, Mr. Mikhail Gorbachev, General Secretary of the Soviet Communist Party, would make no agreement that did not include strict language to restrict SDI research to the laboratory.

The second observation is that *the Soviets were very concerned about SDI and feared American technology in general*. After the President’s 1983 SDI announcement, they sought at every corner to press the United States to limit SDI research and development. At the same time several major trends were developing in the USSR. The Soviet successes in the 1970s at home and abroad faded during the 1980s and by 1989 had given way to failures in agriculture, the domestic economy, technology, and world trade. The USSR had become the world’s leading importer of grain.¹⁶ Soviet military strength was slipping in comparison to the United States yet costing the Soviet government far more by comparison as a percent of gross national product (GNP). The USSR pulled out of Afghanistan with a sense of failure reminiscent of the U.S. withdrawal from Vietnam. The USSR had few non-military

¹⁴. Ibid., pp. 754, 761.

¹⁵. Ibid., p. 772.

¹⁶. Noguee, p. 354.

goods to offer the world, or its own people. Even its export of military goods began a rapid fall in 1987, from a 1986 high of 43 percent of the world's market to 26 percent by 1991.¹⁷ In 1989, with the Warsaw Pact crumbling around them, the Soviets were no longer in a position to negotiate from strength. These facts coupled with the belief the U.S. Congress would keep (had kept) the Reagan and Bush administrations' SDI efforts within the bounds of the narrow interpretation of the ABM Treaty, brought the USSR to a point where they were prepared to make significant reductions in strategic offensive weapons.

Many SDI opponents claim SDI kept the United States from reaching early agreements with the USSR to reduce arms. Conversely, many SDI advocates claim it was, in fact, the U.S. position of strength based upon the threat of SDI that finally led to successful negotiations with the USSR. I believe neither claim is completely correct, but rather *it was primarily the failure of the Soviet system coupled with Soviet willingness to admit failure and recognize their inability to keep up with an expanding U.S. and Western economic and technical base that brought the Soviets to accept deep cuts in strategic weapons*. An honest self examination told the Soviets they could not continue to finance their security policy let alone upgrade it to stay on par with American technology. The Soviets saw their only hope for survival was to reduce the size and expense of their military establishment so they could devote more resources to a grossly neglected Soviet society.

As the world watched in amazement from 1989 to 1991, the Soviet Union let go of Eastern Europe, the Warsaw Pact folded, and the Berlin wall came down. On 30 July 1991 President George Bush and Mr. Gorbachev signed START in Moscow. When fully implemented, this treaty will cut strategic nuclear delivery vehicles (ICBMs, SLBMs, and bombers) to sixteen hundred and countable warheads to six thousand, an amazing reduction of strategic nuclear forces by 30 to 40 percent.

Almost immediately after START was signed, a second round of talks began that were aimed at further reductions in nuclear forces. At the same time, the United States took all strategic bombers off alert status; stood down all ICBMs that were scheduled to be deactivated under START; halted development of the rail garrison MX, the land-mobile Midgetman ICBM, and the Short Range Attack Missile II; and announced plans to withdraw and destroy all nuclear artillery shells and all Lance nuclear warheads, and remove all tactical nuclear weapons from U.S. surface ships and attack submarines. Mr. Gorbachev announced the USSR would respond in kind.

In October 1991 the U.S.-USSR talks on reductions in strategic weapons were expanded to include representatives from the Soviet Republics that held nuclear weapons: Russia, Ukraine, Kazakhstan, and Belarus. Following the demise of the USSR in December 1991, the Lisbon Protocol was signed in May 1992 by Russia, Ukraine, Kazakhstan, Belarus, and the United States. Under this protocol, the four republics of Russia, Ukraine, Kazakhstan, and Belarus accepted START treaty successor status. In signing the protocol, Ukraine, Kazakhstan, and Belarus agreed to accede to the NPT as non-nuclear states.

The START and post-START discussions were accompanied by a series of less publicized space and defense negotiations about cooperation in missile defenses. In January of 1991 President Bush had concurred with a DOD proposal to develop a non-nuclear U.S. ABM system called Global Protection Against Limited Strikes (GPALS). This proposal represented an evolution of the SDI program combined with a variation of a December 1989 proposal from Senator Sam Nunn called Accidental Launch Protection System (ALPS).¹⁸ The concept of GPALS included a space-based element that would not be in compliance with the traditional interpretation of the ABM Treaty. With Iraq's use of missiles in the Gulf War that resulted in the deaths of American soldiers fresh in many minds, the administration reinforced the argument that the United States needed a thin national ABM system to defend against the threat of an accidental or unauthorized missile launch, or attacks from third world or terrorist states like Iraq. As a result, the Bush administration laid out proposals in the SCC for changes

¹⁷. *World Military Expenditures and Arms Transfers*, U.S. Arms Control and Disarmament Agency report (Washington, D.C.: GPO, 1994), p. 17.

¹⁸. "A Chronicle of Treaties, Negotiations, Proposals, Weapons, & Policy," *Arms Control Reporter* (Cambridge, Mass.: IDDS, 1989): 575.B.390.

to the ABM Treaty that would permit the development of GPALS. In July 1991 Mr. Gorbachev proposed the development of a joint ABM early warning system to the Group of Seven (G-7), and in October 1991 he further agreed to consider U.S. proposals for ABM systems. He also tabled the idea of a joint ground and space based missile defense system.¹⁹

In November 1991 the U.S. Congress passed the Missile Defense Act that directed DOD to deploy by 1996 a single site ABM system that would comply with the ABM Treaty. The Congress was, no doubt, influenced by the Bush administration's request for better missile defenses in light of the experiences of the Gulf War. The Missile Defense Act also directed the Bush administration to discuss ABM Treaty amendments with the USSR that would permit a national ABM defense system and permit increased use of space-based sensors for direct battle management. These discussions were also to clarify with the USSR the rules for testing ABM defenses with space-based components and the demarcation between theater and strategic ABM defenses. However, on Christmas 1991 the USSR ceased to exist.

In January 1992 Mr. Boris Yeltsin, President of the newly independent Russian Federation, echoed Mr. Gorbachev's previous call for a joint ABM system. In February 1992 at Camp David, Presidents Bush and Yeltsin discussed the idea of joint defenses and shared concerns about threats, not from each other, but from third world terrorist regimes who might acquire nuclear weapons and missiles. Finally, in June 1992 Presidents Bush and Yeltsin issued a joint U.S.–Russian statement agreeing

□□□ that their two nations should work together with allies and other interested states in developing a concept for such a Global Protection System as part of an overall strategy to counter the proliferation of ballistic missiles and weapons of mass destruction.²⁰

Their concept of a Global Protection System (GPS) called for a high-level group to explore the potential for sharing early warning information through the establishment of an early warning center and the potential for cooperation with other states in developing ballistic missile defense technologies. The high-level group was also chartered to examine existing treaties and consider possible changes or the need to develop new treaties to facilitate GPS.

The U.S.–Russian high-level group met in July 1992 in Moscow. The head of the Russian delegation was Deputy Foreign Minister Georgiy Mamedov; the U.S. delegation was headed by U.S. Chief of State Department Policy Planning Dennis Ross. The delegations agreed to create three lower level working groups to examine issues in more detail. These working groups included a Global Protection System Concepts Working Group, a Technology Cooperation Working Group, and a Non-Proliferation Working Group;²¹ they met in September and October 1992. Following the U.S. presidential elections in November 1992, U.S.–Russia talks were put on hold pending the change in the U.S. administration.

Just prior to leaving office in January 1993 President Bush signed the START II treaty with President Yeltsin in Moscow. When START II reductions are complete (by the year 2003, or by 2000 with U.S. assistance to Russia), each side will reduce strategic warheads to 3,000 to 3,500, limit SLBM warheads to 1,700 to 1,750, and eliminate all MIRVed ICBMs and all heavy (Russian SS-18) ICBM launchers in addition to the 1991 START reductions. START II will result in a total reduction of U.S. and Russian strategic forces to about 25 percent of the pre-START levels.²²

In April 1993 at Vancouver, President Bill Clinton had his first meeting with President Yeltsin. The two agreed “it is necessary to achieve the earliest possible resolution of questions about cooperation in nonproliferation of missiles and missile technology in all aspects.”²³ Later the same month President Yeltsin met with leaders of the Western European Union (WEU) and presented a proposal that the United States and Russia should establish a joint early warning center that would use

¹⁹. *Arms Control Reporter* (1991): 575.B.403 and 405.

²⁰. *U.S. Department of State Dispatch* (20 July 1992): 571.

²¹. *Ibid.*

²². *Dispatch* (4 January 1993): 5.

²³. *Arms Control Reporter* (1993): 575.B.427.

information from U.S. and Russian early warning systems.²⁴ His proposal called for joint discussion to examine the possibility WEU states could participate in GPS. The Clinton administration responded to Yeltsin's proposal by announcing it would continue the joint missile defense talks with Russia begun under President Bush.²⁵

Also in May 1993 Secretary of Defense Les Aspin announced the Strategic Defense Initiative Organization would be renamed the Ballistic Missile Defense Organization (BMDO) to reflect a change in the Clinton administration's focus from concepts that included space-based global defenses to an emphasis on mobile TMD systems. The Clinton administration proposed BMDO be funded at \$3.8 billion for FY94, the same level of funding as in FY93 for SDIO. Of this amount, approximately \$1.7 billion was requested for TMD, an increase by about \$700 million more than FY93. Only \$1.2 billion was requested for strategic missile defenses.²⁶ This increase in emphasis and funding for TMD fell in line with the results of Secretary Aspin's "Bottom Up Review" of the DOD. The review, released in October 1993, conceded the SDI research effort had failed to develop effective defenses against a large-scale missile attack. It also acknowledged President Clinton's skepticism about the need for GPALS and concluded the greatest future threat was from the proliferation of theater ballistic and cruise missiles armed with weapons of mass destruction.²⁷ Finally in December of 1993 and with inputs from the DOD, State Department, and National Security Council, the Clinton administration initiated an effort to clarify with Russia the ABM Treaty as it pertains to strategic versus theater missile defenses.

In summary, concepts of missile defenses have gone from a limited ABM defense (Safeguard-Nixon), no defense (Carter), a strategic defense umbrella (SDI- Reagan), a limited national defense system (GPALS-Bush), and an international, global protection system (GPS-Bush) to the current emphasis on mobile theater defenses over strategic missile defenses (TMD-Clinton). With this history of missile defenses, I will now turn to an assessment of the theater ballistic missile threat the United States faces and possible ways to meet that threat.

Threat and Efforts to Contain the Threat

What threat does the United States face in the future from theater ballistic missiles? Does a focus on the threat of theater ballistic missiles occur at the expense of ignoring threats from other delivery vehicles such as aircraft or cruise missiles? What means are available to control the proliferation of ballistic missiles or nuclear, biological, and chemical weapons of mass destruction they might deliver, and how effective are these means? It is important to address these questions before we can conclude the United States needs such a capable TMD system it must engage in a process to clarify restrictions set by the ABM Treaty, a treaty that was designed to limit strategic missile defenses, not TMD systems.

In World War II, Germany launched more than thirteen hundred V-2 ballistic missiles against London and more than sixteen hundred against Antwerp.²⁸ In the manner of those fired by Iraq during the Gulf War, the German V-2 missile was of little use against military targets, but had significant use as a weapon of terror. Sir Winston Churchill wrote that the V-2 "imposed upon the people of London a burden perhaps even heavier than the air-raids of 1940 and 1941."²⁹ Churchill's thoughts were echoed by British writer Norman Longmate who interviewed thousands of Londoners who experienced the V-2 attacks.³⁰ Also in a manner similar to the Iraqi Scuds used during the Gulf War, German V-2s diverted Allied military efforts from other operations to target V-2 launch sites. The allies were just as unsuccessful in locating and destroying mobile V-2s in World War II as were the allied forces in finding Scuds during the Gulf War.

²⁴. Ibid.

²⁵. *Space News*, 17–23 May 1993, p. 2.

²⁶. Bruce C. P. Rayner, "From SDIO to BMDO: Space Technology at the Crossroads," *Military & Aerospace Electronics*, 14 June 1993, p. 17.

²⁷. *DoD Report of the Bottom-Up Review* (Washington, D.C.: GPO, 1993), p. 43,44.

²⁸. Gregory S. Jones, *The Iraqi Ballistic Missile Program: The Gulf War and the Future of the Missile Threat*, monograph published by the American Institute for Strategic Cooperation, Summer 1992, p. 11.

²⁹. Winston S. Churchill, *Triumph and Tragedy* (Boston: Houghton Mifflin Company, 1953), p. 39.

³⁰. Norman Longmate, *Hitler's Rockets: The Story of the V-2s* (London: Hutchinson & Co., 1985), pp. 225–239.

Like a very long range piece of artillery, the ballistic missile delivers a warhead with no warning. Terrible enough as the delivery vehicle of a conventional warhead, a ballistic missile's effects can be greatly multiplied with the use of a chemical, biological, or nuclear warhead. These weapons of mass destruction (WMD), like conventional weapons, can also be delivered via aircraft, artillery, and cruise missiles, or by means of covert, terrorist actions. But the ballistic missile stands above other means of delivery in its ability to deliver (as a function of the missile-size and range) a large warhead long distances in the minimum amount of time and at a cost that is deemed affordable by many countries. Once launched, whether by intention or in error, a ballistic missile cannot be recalled. (Only test missiles normally have self-destruct systems on board.) A ballistic missile requires no pilot and no in-flight refueling or stop at an enroute airfield. Because the ballistic missile travels at a significantly higher velocity than an aircraft and is a smaller target, the problem of defending against ballistic missiles is a far greater challenge. It is precisely because of these factors that the German V-2 was viewed as a more serious threat to Londoners and caused serious morale problems despite the fact there were only about twenty-five hundred deaths in London from V-2s compared to more than five thousand deaths from the V-1 cruise missile and more than one hundred twelve thousand from aircraft.³¹ It is because of the inherent capabilities of the ballistic missile (warhead delivery weight, range, speed, and problems to defend against) that the ICBM and SLBM, more so than the intercontinental bomber, form the basis of U.S. and USSR or Russian strategic nuclear forces.

During the Cold War a number of countries acquired first generation theater ballistic missiles. Scuds were used by Egypt in the 1973 war; more than six hundred Scuds were launched during the Iran-Iraq war from 1987-1988; and at least two thousand Scuds were used by the Soviets in Afghanistan between 1988 and 1991.³² Table 4 (Appendix) contains a list of countries that currently have ballistic missile systems of concern to the United States.

One of the first observations to be made from an examination of this list is to note the sheer number of countries that have missiles. It should come as no surprise then to learn the missile programs of one country have been aided by technology from a number of other countries. Iraq's missile program, for example, was the beneficiary of many years of assistance from Argentina, Brazil, Germany, North Korea, and the USSR.³³ With help from Brazilian technicians and extra fuel tanks from North Korea, Iraq modified the Scud-B to extend its range to 600 kilometers creating a missile Iraq called the al-Hussein. The approximately eighty-one "Scud" missiles Iraq launched during the Gulf War were mostly al-Husseins. Prior to the Gulf War, Iraq had other modification programs underway to create a 900 kilometers version (the al-Abbas) and a 2,000 kilometers three-stage vehicle (the al-Abed) as well. Iraq had announced in December 1989 that it had successfully completed the first test in the development of this rocket.³⁴ Finally, Iraq had a second program to develop a three-stage missile with the assistance of several German companies using the two-stage Condor II from Argentina as a base.³⁵

Another observation to be made from Table 4 (Appendix) is that a significant number of third world countries have the Scud and Frog missiles. These missiles were obtained from the USSR, China, or North Korea. Countries that have supplied assistance (technology, components, or both) to others are shown in Table 2. Although most countries have depended upon outside help to begin their missile development programs, a number of countries now have a largely indigenous missile program of their own: Argentina, Brazil, China, India, Israel, North Korea, Libya, and Pakistan.

³¹. Robin Ranger, "Theater Missile Defense: Lessons from British Experiences with Air and Missile Defense," *Comparative Strategy*, 12 (1993): 399-413.

³². Duncan Lennox, "Battling with the Ballistic Threat," *Jane's Defence Weekly*, 20 March 1993, p. 26.

³³. *Arms Control Reporter* (1991): 706.B.54-55.

³⁴. *Ibid.*, (1990): 706.B.24.

³⁵. *Ibid.*, (1991): 706.B.55.

Given that many countries have felt it necessary to acquire ballistic missiles and given that these missiles are particularly threatening when armed with WMD, what course of action should the United States take to improve its security as well as international security as a whole? I will answer this question by first reviewing what has been done thus far to control the proliferation of WMDs as well as the proliferation in ballistic missiles.

Geneva Protocol of 1925

Negotiations among many countries after World War I led to the Geneva Protocol of 1925. This protocol prohibits the use of “Poisonous or Other Gases, and of Bacteriological Methods of Warfare.”³⁶ However, the protocol does not ban production of these weapons and permits signatories to use chemical and biological weapons against non-party states in retaliation against not observing the provisions. Unfortunately, the Geneva Protocol has no compliance or verification regime. As of January 1993, one-hundred and thirty countries were party to the Geneva Protocol.³⁷

Non-Proliferation Treaty of 1968

Negotiations to control the proliferation of nuclear weapons were concluded in 1968 with the signing of the Non-Proliferation Treaty (NPT). The treaty divides the world into “haves” and “have-nots.” Currently the declared Nuclear Weapons States (NWS) include the United States, Russia (as successor to the USSR), the United Kingdom, France, and China. All other parties to the treaty are Non-Nuclear Weapons States (NNWS). The NWS agree not to assist any state in acquiring nuclear weapons and agree to assist NNWS with peaceful nuclear programs. The NNWS agree not to acquire nuclear weapons, but may receive assistance and technology to develop nuclear power facilities or other non-weapon related nuclear programs. Compliance with the treaty is verified with the assistance of inspections conducted by the International Atomic Energy Agency (IAEA). As of December 1993 there were 162 NPT states.³⁸

Biological Weapons Convention of 1975

After years of negotiations specifically devoted to ban the production of biological weapons, the United States and USSR reached agreement on a convention in 1970 and subsequently submitted it to the United Nations. The UN General Assembly approved a resolution commending the provisions of the Biological Weapons Convention (BWC) that finally went into effect in 1975. This convention bans development, production, stockpiling, and use of biological agents. As of January 1994 the BWC had been ratified by 133 countries (some by accession or succession).³⁹ Like the Geneva Protocol of 1925 that preceded it, the BWC makes no provision for verification and compliance. However, members are currently considering proposed ways to establish formal verification procedures. A ban on production of biological weapons is inherently difficult to verify because of the relative ease with which a state can covertly develop biological weapons under the guise of a medical or biological research program. Such

Table 2. Countries Supplying Missile Technology Assistance and/or Components

<i>Countries Supplying Assistance</i>	<i>Countries Receiving Assistance</i>
Argentina	Egypt, Iraq
Brazil	China, Iraq, Libya
France	Israel, Pakistan
Germany	Brazil, Iraq, Libya
Israel	South Africa
United States	Israel, S Korea, Taiwan

³⁶. Ibid., (1992): 860–61.1.

³⁷. Ibid., (1993).

³⁸. Ibid., (1994): 602.A.10.

³⁹. Ibid., (1994): 701.A.3.

weapons can be produced from commonplace, readily available materials.

Missile Technology Control Regime of 1987

Concerned about the proliferation of ballistic missiles, seven Western states began negotiations in 1983 to seek export controls over ballistic and cruise missile technology. In 1987 they reached an agreement called the Missile Technology Control Regime (MTCR). The MTCR initially restricted exports of missiles with a nuclear payload capability (500 kg was deemed the smallest practical weight for a nuclear warhead) and a range greater than 300 kilometers (deemed the shortest range for tactical use with a nuclear weapon). In 1993 MTCR membership approved changes to control the export of any missile (or system) with a range greater than 300 kilometers regardless of payload. This change was designed to expand the MTCR restrictions to cover chemical and biological weapons as well as crude nuclear weapons that could be designed with a net warhead mass under 500 kg. As of December 1993, twenty-five countries had joined the MTCR.⁴⁰

Chemical Weapons Convention of 1993

Following a path somewhat parallel to the BWC, the Chemical Weapons Convention (CWC) resulted from a series of U.S.–USSR (later U.S.–Russia) bilateral talks and was signed by 125 countries in January 1993. The CWC will not go into force until two years after sixty-five or more states ratify the treaty. Only four states had ratified the CWC as of January 1994.⁴¹ President Clinton forwarded the treaty to the U.S. Senate for ratification in April 1994.⁴² Compliance with the treaty will be verified by the Organization for the Prohibition of Chemical Weapons (OPCW) in a manner similar to the IAEA for NPT.

Effectiveness of Non-Proliferation Efforts

How effective have these efforts been to control the proliferation of ballistic missiles or weapons of mass destruction?

BWC: In January 1993 the U.S. Arms Control and Disarmament Agency (ACDA) issued a report that said eight countries most likely had biological weapons programs and stockpiles (China, Egypt, Iran, Iraq, Libya, Taiwan, Russia, and Syria) despite the fact they are signatories to the BWC.⁴³ In the case of Iraq, UN inspectors determined after the Gulf War that Iraq had conducted research, but had no biological weapon productions program.⁴⁴ Russia, on the other hand, has acknowledged its program had, in fact, continued until 1992.⁴⁵ Open sources list up to eight additional states beyond these listed by ACDA that probably have clandestine offensive biological weapons.⁴⁶ With the uncertainty it is even possible to develop an adequate verification or compliance regime, it will be difficult to either confirm or dispute the existence of such programs.

NPT: Israel is believed to have nuclear weapons. India and Pakistan are believed to have the capability to quickly produce them. None of these countries are members of NPT, nor does it seem they are inclined to join anytime soon. North Korea, although a signatory of the NPT, is suspected of having one or two nuclear weapons and of producing additional fissile material with the intent to produce more nuclear weapons. For more than a year, North Korea has repeatedly blocked the IAEA's attempts to inspect certain facilities in accordance with its commitment under the NPT. Despite a year of discussions among North Korea, the United States, China, and the United Nations and despite threats of sanctions and loss of trade, North Korea continues to refuse the IAEA at the time of this writing.

⁴⁰ Ibid., (1994): 706.A.2.

⁴¹ Ibid., (1994): 704.A.2.

⁴² Theresa Hitchens, "Clinton Urges Swift U.S. Ratification of Chemical Treaty," *Defense News*, 18–24 April 1994, p. 12.

⁴³ *Arms Control Reporter* (1993): 701.B.107.

⁴⁴ Ibid., 1994, p. 701.A.4.

⁴⁵ Ibid., 1992, p. 701.B.97.

⁴⁶ U.S. Congress, Office of Technology Assessment Report, *Proliferation of Weapons of Mass Destruction* (Washington, D.C.: GPO, August 1993), p. 65.

As mentioned earlier, Iraq—who had ratified NPT in 1969—had developed a much more extensive nuclear weapons program before the Gulf War than had been suspected by outside observers. Open sources identify ten undeclared nuclear weapons states either having or having previously had the intent and capability to produce nuclear weapons.⁴⁷ Two of these states, Argentina and Brazil have subsequently declared their intent to cease pursuit of nuclear weapons; however, neither have joined the NPT as of the time of this writing.⁴⁸ South Africa declared it had produced six nuclear weapons, but subsequently dismantled them; it joined the NPT as a NNWS in 1991. The activities of these states demonstrate it is possible to skirt the NPT if a state is inclined to do so.

A handful of other states pose the potential for concern because of their modern technical capabilities in spite of no present obvious intent to develop a nuclear weapon. This list includes Japan, South Korea, and Taiwan. In addition, there is a growing concern that a number of third world countries will be able to purchase Russian nuclear weapons and material from Russian organized crime groups, if reports prove true that organized crime is eroding the government's control of its stockpile of nuclear material.⁴⁹

MTCR: The proliferation of ballistic missiles may have already surpassed the ability of the MTCR to exercise any significant influence to reduce the number of states that are developing or acquiring ballistic missiles (see Table 4, Appendix). In 1993 two incidents occurred that serve to demonstrate how difficult it is to control the exportation of missile technology because of the conflicting interests between export control and efforts to promote commercial trade or other national goals. The first situation involved Russia that was pressured by the Clinton administration to break its contract to supply India with liquid fueled (cryogenic) rocket engines and technology in support of India's space program. Instead of canceling the contract entirely, Russia will provide India with the engines, but not the technical data that would allow India to produce its own liquid fueled engines. In exchange, the United States made Russia a full partner in the U.S. led international space station and pledged \$400 million to support Russia's space program.⁵⁰ India responded with criticism of U.S. intervention in its contract with Russia, but stated the interference had "only nuisance value", and India was "self-sufficient both in design and in missile technology."⁵¹ Ironically, the space station program faces the possibility of being canceled because of cost.⁵²

The second incident concerns the U.S. accusation that China violated the MTCR by selling M-11 missiles to Pakistan. On 25 August 1993 the State Department issued a statement that the United States would impose limited two-year sanctions on "munitions and dual use items, and denial of U.S. government contracts" with China and Pakistan because of the missile transfer.⁵³ China responded by denouncing the sanctions as unjustified and based on "inaccurate intelligence."⁵⁴ In addition, the sanctions impacted several U.S. space corporations with potential losses totaling more than \$400 million in the sale of six satellites to China. In November 1993, the administration considered waiving sanctions in exchange for a "promise" from China not to violate the MTCR again.⁵⁵ However, the administration decided in the end to let four of the six satellites go without constraint, deeming they had no MTCR controlled components. The other two satellites contained MTCR controlled items, which when replaced by alternate components, were also sold to China.

CWC: The CWC is not yet in force, but already a variety of open sources list up to eleven countries believed to possess offensive chemical weapons capabilities.⁵⁶ Only time will reveal if the CWC will have greater effectiveness than either the BWC or NPT in limiting proliferation.

⁴⁷. Ibid.

⁴⁸. Arms Control Reporter (1994): 602.A.7.

⁴⁹. Seymour M. Hersh, "The Wild East," *The Atlantic Monthly*, June 1994, p. 61.

⁵⁰. Paul Mann, "U.S., Russia Draft Historic Space Pact," *Aviation Week and Space Technology*, 6 September 1993, p. 22.

⁵¹. "Our God Can Lick Your God," *India Today*, 28 February 1994, p. 26.

⁵². "NASA, White House Juggle Space Station Price Tag," *Aviation Week and Space Technology*, 18 April 1994, p. 59.

⁵³. "China and Pakistan: M-11 Missile Sanctions," *U.S. Department of State Dispatch* (30 August 1993): 607.

⁵⁴. Lena H. Sun, "China Says U.S. Sanctions are 'Entirely Unjustified,'" *Washington Post*, 27 August 1993, p. 27.

⁵⁵. Jeffrey R. Smith, "U.S. Offers to Waive China Trade Sanctions," *Washington Post*, 11 November 1993, p. 39.

⁵⁶. Ibid.

Analysis of Nonproliferation Efforts and Threats

The result of the overall non-proliferation effort is a record of mixed success. No single effort has stopped proliferation. At best, the non-proliferation regimes have made it more difficult, but not impossible, for states to develop WMDs or ballistic missiles.

At the heart of the problem are two fundamental issues. The first relates specifically to the nature of NPT. *As long as the NPT retains its discriminatory nature that permits the five "Nuclear Club" members to have nuclear weapons and denies other states the same opportunity, there will be states, such as India, that will not join the NPT.* India developed a nuclear capability in response to China's nuclear threat, as well as to make a statement to the world that India deserves respect as a prominent state. As a state with almost one fifth of the world's population, the largest democratic state in existence, India sees the nuclear bomb as a ticket into the circle of world powers. What does India have to gain by giving up this advantage and taking what it sees is a back row seat with the "third world"?

The other fundamental issue relates to nonproliferation efforts in general. *States develop security policies in response to their threat perceptions.* For example, Pakistan has acquired a nuclear capability primarily in response to India's military strength and overall capability. Pakistan uses India as a reason not to sign the NPT. But even if India was to join the NPT, Pakistan might nevertheless be tempted to keep a nuclear production capability in response to India's overall superiority in conventional forces for the same reason NATO depended on tactical nuclear forces to balance the numerical superiority of the Warsaw Pact. Having lost three wars with India that resulted in the loss of territory (East Pakistan and land claims in Kashmir), Pakistan foreign policy reflects an acute awareness of the country's strategic vulnerability. Why should Pakistan give up its claim to nuclear weapons when it feels it has been put at arms length by the United States whom it once viewed as a close friend and ally? The 1985 Pressler Amendment to America's Foreign Policy Assistance Act said aid to Pakistan would be contingent upon the President's ability to confirm Pakistan did not have a nuclear bomb. American aid stopped after 1990 when it was no longer possible for the President to certify Pakistan did not have a nuclear weapons program. As a consequence, Pakistan has yet to receive F-16s and other military equipment for which it had previously paid \$1.3 billion. It is not surprising Pakistan may feel that it cannot depend upon the United States to protect its interests.⁵⁷

These two issues, a state's concept of what it must do to achieve world status or regional recognition and the concept of what each state must do to preserve its national security, will forever create challenges and frustrations for nonproliferation efforts. I do not suggest we should abandon current nonproliferation efforts, but that one must be honest and acknowledge the reality of their limits. *Nonproliferation efforts, although commendable in many ways, have not eliminated the threat many states face from ballistic missiles armed with conventional warheads or WMD and cannot be expected to do so entirely.* For a variety of reasons, many countries are aggressively developing new theater ballistic missiles with longer ranges and greater capabilities despite the MTCR.

The threat that drives the need for TMD capabilities may be summarized as follows: The Gulf War, for the first time, brought the United States into an engagement with an enemy who possessed and used theater ballistic missiles potentially armed with WMDs. Fortunately, Iraq did not use the chemical missile warheads it had in stock, in contrast to its use of chemical armed artillery in the Iran-Iraq War. More fortunately, Iraq had not yet achieved a nuclear capability. *In light of the limitations of many nonproliferation efforts and in light of the number of countries that have active programs to produce better ballistic missiles and weapons of mass destruction, the United States cannot expect to be as fortunate the next time around. The United States must develop a capable, mobile TMD system.* While it is true the United States proper is not directly threatened by any country with theater ballistic missiles, if the United States deploys forces again to the Middle East, as it did in Desert Storm, it will find itself once again facing theater ballistic missiles. Similarly, U.S. forces in South Korea are under the threat of ballistic missile attacks from North Korea. In addition, many of our allies are under an increasing threat from theater ballistic missile in their regions. Clearly it is within the U.S. national security interest to be able to assist its allies in meeting such threats.

⁵⁷. "Asia the Subcontinent's Own Cold War," *The Economist*, 25 December 1993—7 January 1994, p. 43.

U.S. TMD Systems and the ABM Treaty

With the preceding assessment of the threat and a review of the limits of nonproliferation methods in mind, I will now turn to a discussion of present and planned U.S. TMD systems. This discussion will also address the current effort to clarify the ABM Treaty's distinction between tactical TMD systems and strategic ABM systems and address specific concerns that TMD efforts might undermine the ABM Treaty and plunge the United States and Russia back into a strategic arms race. I will conclude this discussion with recommendations to resolve these concerns and meet the growing threat from theater ballistic missiles.

U.S. TMD Systems

What capability does the United States currently have to defend against ballistic missiles? Having dismantled the Safeguard ABM system in 1976, the United States has been without any ABM defenses against strategic missiles. The only U.S. theater ballistic missile defense system is the Army's Patriot missile system. The Patriot was originally designed by the U.S. Army in the 1960s as an anti-aircraft missile. However, it was modified under a program that began in the early 1980s to give it a TMD capability in response to the Soviet buildup of theater ballistic missiles in Europe. During the same period, the Soviets modified some of their air defense missile systems for a similar TMD role (SA-10 and SA-12, for example).⁵⁸

The first real test for any of these modified surface to air missile (SAM) systems was the Patriot's debut during the Gulf War. Early reports of the Patriot missile's success in the Gulf War gave way after the war to varying degrees of criticism about the missile's overall performance in both Saudi Arabia and Israel. The Government Accounting Office (GAO) reported to the Congress in April 1992 there was insufficient data (in the GAO's opinion) to support the U.S. Army's claim that the success rate of the Patriot was 80 percent in the Saudi Arabian theater and 50 percent in Israel.⁵⁹ One of the most critical reviews of the Patriot came from General Dan Shomron, the Chief of Staff of the Israel Defense Force during the war. General Shomron stated in regards to the Patriots used to defend Israel, "I can say with confidence that one Scud missile exploded in the air from a Patriot. And there were close hits and diversions. But in the terms that I would define as success, I cannot talk about great successes."⁶⁰

Another assessment of the Patriot's performance in Dessert Storm was done by Drs. Theodore Postol and George Lewis of MIT who based their conclusions upon analysis of video taped Patriot missile engagements. They stated "there is strong evidence that its interceptors failed to destroy a significant number of attacking Scuds."⁶¹ The Raytheon Company, which makes the Patriot missile, refutes the Postol-Lewis analysis and supports the U.S. Army's conclusions.⁶²

However successful the Patriot was during the war, the operation served to highlight the need to develop more capable TMD systems and focused attention on the proliferation of ballistic missiles and WMDs. Since the war, the DOD has taken a number of significant steps to improve the Patriot and develop an integrated TMD program that involves the efforts of all the services. This integrated effort, under the direction of BMDO, uses a multi-layered defense architecture similar in principle to the concept developed by SDIO and earlier against ICBMs. This integrated effort seeks ways to target theater ballistic missiles throughout their time of flight from launch to a point just before impact.

Missile launches can be detected by Defense Support Program (DSP) satellites built during the Cold War to detect launches of long burning, hot ICBM missile plumes. Despite their limited ability to detect shorter burning and relatively cooler theater ballistic missiles, DSP satellites did provide allied forces in the Gulf War with a limited amount of Scud launch data including general launch and impact point locations. General Merrill McPeak, USAF Chief of Staff, commented that for the USAF in

⁵⁸. Lennox, p. 26.

⁵⁹. "Operation Desert Storm: Data Does Not Exist to Conclusively Say How Well Patriot Performed," *GAO Report to Congressional Requestors* (Washington, D.C.: GPO, September 1992), GAO/NSIAD-92-340, pp. 1-3.

⁶⁰. Translation of video taped interview in Tel Aviv, Israel, on 14 September 1993 by Reuven Pedatzur.

⁶¹. Theodore A. Postol, "Lessons of the Gulf War Experience with Patriot," *International Security* (Winter 1991/92): 170.

⁶². Robert M. Stein, "Correspondence," *International Security* (Summer 1992): 199.

particular, Desert Storm “really opened our eyes” to the need for and use of space-based systems such as DSP.⁶³ As a result of the Gulf War, the USAF has initiated an intense effort to integrate information from DSP and other satellites and aircraft equipped with advanced synthetic aperture radar, electro-optical sensors, infrared sensors, and moving target radar with high speed communications and data processing. In future conflicts, this integrated data would be sent near real-time to theater forces.⁶⁴

Along with this effort is another USAF initiative to develop a high speed interceptor missile to be carried by an airborne fighter or unmanned aerial vehicle (UAV) and fired at a theater ballistic missile during its boost phase. Integrated launch information from sensors in space will enable the fighter or UAV to target the ballistic missile. Another more exotic air force program proposes to employ an airborne laser to track and kill a ballistic missile during its boost phase.⁶⁵ The USAF is also testing a concept that will enable fighters to use integrated information to help them quickly locate and target mobile launchers within minutes after a launch before they have time to relocate.⁶⁶ The obvious advantage of a boost phase intercept is the ballistic missile warhead is destroyed over the head of the enemy. This opportunity is particularly important if the missile is carrying early release munitions or any WMD because the dispersal of chemical or biological agents or nuclear fallout will be over enemy territory.

The next layer of defense consists of a two-tier (upper and lower) TMD system being developed primarily by the U.S. Army for land-based defense and the U.S. Navy for sea-based defense. The purpose for the two tier system is to intercept intermediate range missiles (1,000 to 3,500 kilometers) while they are above the atmosphere (above 100 kilometers) before they arrive in the vicinity of their intended target. As in the case of a boost phase intercept an upper tier, exo-atmospheric, intercept will keep the dispersal of any chemical or biological agent or nuclear fallout as far away as possible. If the missile is not intercepted until it approaches the intended target, a successful intercept might result in the dispersal of some portion of the agent. The lower tier provides defense in depth to limit leakage. In addition, the lower tier is also needed to target shorter range ballistic missiles (less than 1,000 kilometers) that spend most or all of their time of flight within the lower atmosphere.

The primary candidate system for land-based upper tier defense is the Theater High Altitude Area Defense (THAAD) being developed by the U.S. Army. For sea-based upper tier TMD, the U.S. Navy is considering both the Army’s THAAD and another program called the Light Exo-Atmospheric Projectile (LEAP).

The lower tier land-based TMD system is the Patriot. As previously mentioned the U.S. Army is making improvements to the current Patriot system (radar, software, command and control, and interceptor). Under a competitive program to improve the capabilities of the Patriot interceptor missile, the U.S. Army recently selected the Loral Vought Extended Range Interceptor (ERINT) over an improved Patriot missile from Raytheon.⁶⁷ The Army hopes to compliment the Patriot with an additional, more mobile lower tier system called Corps SAM. The U.S. Navy is developing its sea-based lower tier TMD by modifying its Standard Missile and Aegis SPY-1B radar that, like the Patriot, was originally designed for an anti-aircraft role.⁶⁸ Table 3 summarizes these TMD systems.

⁶³. Speech by Gen. Merrill A. McPeak, The Air Force Role in Space, given at the ninth space symposium, Colorado Springs, 15 April 1993.

⁶⁴. David Hughes, “Mitre, Air Force Explore Data Fusion for Joint-STARS,” *Aviation Week and Space Technology*, 7 March 1994, p. 47.

⁶⁵. Barbara Starr, “USAF Seeks Airborne Laser Development,” *Jane’s Defence Weekly*, 2 October 1993, p. 16.

⁶⁶. David A. Fulghum, “Scud Hunting May Drop Under 10-Minute Mark,” *Aviation Week and Space Technology*, 21 February 1994, p. 90.

⁶⁷. David Hughes, “Army Selects ERINT Pending Pentagon Review,” *Aviation Week and Space Technology*, 21 February 1994, p. 93.

⁶⁸. John Haystead, “Next-generation Missile Systems Take Off,” *Military & Aerospace Electronics*, 19 July 1993, p. 17.

Table 3. Summary of TMD Systems

<i>Category of Intercept</i>	<i>TMD System</i>
BOOST PHASE INTERCEPT	Fighter or UAV equipped with air-to-air missile
UPPER TIER INTERCEPT	
Land-based	THAAD
Sea-based	THAAD or LEAP
LOWER TIER INTERCEPT	
Land-based	Patriot or ERINT, Corps SAM
Sea-based	Standard Missile

Concerns about TMD and ABM Treaty Clarifications

Does this concept of a multi-layered TMD system potentially undermine the purpose of the ABM Treaty? Recall from our discussion above the purpose of the ABM Treaty was to prohibit the United States and the Soviet Union from developing national anti-strategic ballistic missile defense systems to insure each party could survive a first strike from the other with enough strategic forces to retaliate. However, the treaty does not *define* the term “strategic ballistic missile.”

The absence of such a definition caused no problem when the United States had no ABM capability, theater or strategic. When the Patriot was modified to defend against short range theater ballistic missile, this lack of definition also caused no problem because the Patriot posed no threat to strategic ballistic missiles. But now, as the United States seeks to give greater capability to TMD systems, the demarcation between “theater” and “strategic” becomes more important. If the United States develops TMD systems with the capability to be used (or even potentially be used) in an ABM role, as defined by the ABM Treaty, then it will have circumvented the treaty in a way that could significantly undermine its purpose and value.

The recent discussions with Russia regarding the ABM Treaty are intended to clarify the demarcation between ABM systems limited by the treaty and TMD systems not limited by the treaty. The United States and Russia have both expressed a desire to keep the ABM Treaty alive, to limit strategic ABM defenses for the same original reasons envisioned when the treaty was signed. The goal of the discussions is to keep TMD systems from undermining the intent of the treaty.

Recommendations

What, then, should be the demarcation between theater and strategic ballistic missiles? In 1972 the United States and USSR had SLBMs in service with maximum ranges of less than 3,000 kilometers.⁶⁹ SLBMs have always been treated as strategic missiles and included as part of the overall strategic force structure whatever their range because their fundamental mission was the same as other longer range ICBMs. However, when START II is completed, the United States and Russia will be left with no strategic ballistic missiles with a shorter range than 6,500 kilometers.⁷⁰

As Table 4 (Appendix) shows, the majority of theater ballistic missiles in existence or under development have a range of less than 1,500 kilometers. Exceptions include ballistic missiles (in existence or under development) in Brazil, China, India, North Korea, and Saudi Arabia. *By selecting 3,500 kilometers as the boundary between “theater” and “strategic” ballistic missiles, the North Korean Taepo Dong-2 falls within the targeted range of potential TMD missiles.* This range does place the French S-3D (3,500 kilometers) within the classification of a theater ballistic missile, and the British SLBM Polaris A-3 (4,600 kilometers) and French SLBM M-4 (5,000) are only slightly beyond this “theater” limit, which brings our discussion to a more difficult problem.

⁶⁹. The range of the U.S. Polaris A2 was approximately 2,900 kilometers; the range of the USSR SS-N-4 was only about 600 kilometers, *The Military Balance 1971–1972*: 57.

⁷⁰. Based on the range of the U.S. Trident C4 missile of 7,400 kilometers and the Russian SS-N-18 missile of 6,500 kilometers, *The Military Balance 1992–1993*: 228, 234.

How can one distinguish a TMD system designed to kill a theater ballistic missile with a range of 3,500 kilometers from a system with some capability against a ballistic missile with a range of 4,600 kilometers (such as the British A-3), or for that matter, a missile with a range of 6,500 kilometers (such as the Russian SS-N-18)? Recall that the ABM Treaty prohibits either party from giving non-ABM systems the “capability” to counter strategic missiles. The problem with this stipulation is it was written during a time in which there was less concern that a number of third world countries would develop 1,500 to 3,500 kilometers range theater ballistic missiles. *The treaty’s absence of a distinction between strategic and theater reflects the fact the treaty was tailored for a situation in the Cold War that is no longer current.* In 1972 the United States and USSR perceived that the primary threat to their national security was from each other’s growing ICBM and SLBM force. However, this East–West Cold War focus has been diluted by a different situation today. A growing threat has arisen, particularly for Russia, that comes from instability in Central, Eastern and Southern Asia as well as from the Middle East. Although the possibility of a U.S. nuclear engagement with Russia has not been eliminated, it is much more likely the next U.S. conflict will be a regional conflict involving theater ballistic missiles from a country other than Russia. We have to face the fact that an effective TMD system might have some degree of capability against a strategic ballistic missile. *The solution therefore is to:*

- (1) agree upon the demarcation between “theater” and “strategic”
- (2) agree upon a qualitative limit for TMD systems
- (3) seek to establish confidence building measures to reinforce each country’s commitment to the ABM Treaty
- (4) honor the ABM Treaty’s prohibition not to test a TMD system against a strategic missile.

There are several measures that can serve to build confidence that neither party is intentionally giving ABM capabilities to TMD systems. *One confidence-building measure (CBM) is to open all TMD testing and operational training to observation from the other party.* Such on-site observation would insure that TMD systems are developed within agreed limits and that neither party is testing or training operators to use TMD systems against strategic missiles. No country will put confidence in any weapon system it has not tested nor expect its military to employ a weapon in a manner in which they have not been trained.

Another CBM is to give full disclosure of the size, mobility, and location of each deployed TMD system as well as prior notification of any redeployment. Garrison for TMD systems should not be in a location that affords protection to either party’s ICBM fields or other strategic targets. Verification can be done with on-site inspection as well as from spaced-based surveillance. Disclosure of critical information about TMD systems would help to insure neither side is attempting to position TMD systems in a manner to create a national ABM system.

A third CBM is to share early warning information. Current U.S. and Russian early warning networks can provide processed data to each other through commercial links. General Charles Horner, commander of U.S. Space Command (previously commander of air operations in the Gulf War), described this CBM as a “vital step in building trust” because the United States would not give away its early warning information if it wanted to preserve a first-strike capability.⁷¹

But what about U.S. allies, Britain and France? Even if the United States and Russia agree on a demarcation between ABM and TMD systems, does such an agreement not force Britain and France to accept that their shorter range SLBMs will be vulnerable to TMD systems? How about China? Should the United States ignore the concern China may have if Russia develops TMD systems that would have some potential capability against shorter range Chinese strategic missiles? I will answer these questions indirectly by discussing the growing concerns Britain and France also have about the threat of theater ballistic missiles.

⁷¹. Jeffrey M. Lenorovits, “U.S., Russia to Share Missile Warning Data,” *Aviation Week & Space Technology*, 11 April 1994, p. 24.

As previously mentioned, the United States and Russia—earlier the United States and USSR—are discussing the possibility of sharing early warning information as well as the possibility of developing joint TMD systems. The United States is also a party to similar discussions with NATO.⁷² In addition, the United States has discussed TMD options with Japan⁷³ and is cost sharing the development of a TMD system (the Arrow) with Israel.⁷⁴

In response to U.S.–Russian discussions about TMD, the WEU began its own talks in 1992 about the need for a European TMD system.⁷⁵ The WEU planned to consider participation in the Bush and Yeltsin proposal of GPS as well as an independently developed European missile defense system citing Libya, Syria, and Egypt as countries of particular concern. The WEU also directed its members to conduct a study of a European TMD system based upon components of planned U.S. TMD systems. In June 1993 the WEU passed a resolution to initiate, through the United Nations, the formation of an international early warning and surveillance center.⁷⁶

In September 1993 France initiated discussions with Russia to consider development of a cooperative TMD system that would make use of Russian SA-12 technology.⁷⁷ France sees this cooperative initiative as an initial step toward developing a broad European TMD system designed to defend against projected North African and Middle East ballistic missiles with ranges of 1,500 to 3,000 kilometers. Britain has also launched a study to examine its own requirements for a TMD capability and plans to consider purchasing systems such as the U.S. THAAD and ERINT.⁷⁸ *It seems France and Britain, even more than the United States, have reason to be concerned about the proliferation of ballistic missile and WMDs.*

All of these discussions underscore the shared view in Europe that there is a growing threat from the proliferation of ballistic missiles and WMDs. There is general agreement between the United States and Russia, and within NATO, that it is necessary to develop effective TMD systems to meet this threat. Therefore, this mutual concern coupled with effective CBMs forms the basis for permitting deployment in a way that will not undermine the ABM Treaty. China's response is much more difficult to determine. At some point China must be brought into the equation. On the positive side, China's inclusion creates the opportunity to address a possible long term solution to the threat of ballistic missile proliferation.

Any long term solution must jointly consider the threat from nuclear weapons as well as ballistic missiles. *To arrive at a long term solution, the United States should initiate a comprehensive round of talks with NATO, Russia, China, other U.S. allies such as Japan and Israel, and with the members of the MTCR to agree upon a time frame to ban all ballistic missiles and ultimately to eliminate all nuclear weapons.* The Intermediate-range Nuclear Forces (INF) treaty signed in 1987 by the United States and the Soviet Union has already demonstrated the potential of such a ban with its elimination of all U.S. and USSR ballistic missiles with ranges between 500 and 5,500 kilometers. As the next step toward a total ban on all missiles, other countries should be invited to join the INF treaty. *To compliment this effort, the United States should create a framework that provides early warning information to other states and allows them to purchase TMD systems in exchange for their demonstrated commitment to eliminate ballistic missiles and WMD.* This framework might initially include an international early warning center and could evolve to include several centers (U.S., Europe, Russia, and Asia). Another option would be to provide early warning information via commercial satellites to member states. Cooperative warning can be developed using present U.S. and Russian early warning systems. Other states with surveillance systems (French Spot satellite for example) could

⁷². Brooks Rigner, "NATO Pursues Ballistic Missile Defense," *Defense News*, 24–30 January 1994, p. 4.

⁷³. David E. Sanger, "New Antimissile System for Japan Is Under Discussion with the U.S.," *New York Times*, 18 September 1993, p. 1.

⁷⁴. "Israel Aims Arrow 2 at Scud Threat," *Washington Times*, 2 February 1994, p. 13.

⁷⁵. *Aviation Week and Space Technology*, 18 January 1993, p. 25.

⁷⁶. "WEU to look into early warning center, European Defense System," *Inside the Army*, 28 June 1993.

⁷⁷. Craig Covault, "Russian SA-12 Missiles Eyed for European ABM," *Aviation Week and Space Technology*, 13 September, 1993, p. 99.

⁷⁸. Charles Miller, "British Weigh Missile Defense Plan," *Defense News*, 21–27 February 1994, p. 38.

be invited to share information that can be used to provide verification and compliance assurance to members of the organization. The center would not replace, but rather would augment the work of existing verification and compliance regimes such as IAEA for NPT and OPCW for CWC.

During the Cold War the United States justified building and deploying a nuclear arsenal because it believed the country needed a force multiplier to deter a numerically superior Soviet force. The United States must now realize that other countries are using the same logic to justify programs to develop their own weapons of mass destruction and the ballistic missiles to deliver them. But as the Gulf War demonstrated, the United States no longer needs nuclear weapons as a force multiplier. Precision air power clearly brought Saddam Hussein to his knees with less collateral damage and injury to civilians than during any previous military campaign. *The United States did not need nuclear weapons during the Gulf War and will not need them in the future except as a deterrent to other states who have them or might acquire them* Our only current justification for keeping strategic weapons, especially ICBMs and SLBMs, is because Russia and China possess them. General McPeak has described ballistic missiles as “destabilizing, because they leave virtually no time for questions” and evoke “a use-it-or-lose-it kind of psychology” on the receiving end.⁷⁹ A discussion among the five declared NWS—all have ballistic missiles armed with nuclear warheads—could lead to a joint agreement similar to the START agreements that would ultimately eliminate all ballistic missiles and nuclear weapons. This effort would provide credibility to our appeals for states like India and Pakistan to join NPT as NNWS.

Summary

The ABM Treaty was designed to limit U.S. and Soviet defenses against strategic missiles in order to contain the nuclear arms race. It has performed this task very well. As our discussion has shown, however, the ABM Treaty did not reduce the number of U.S. and Soviet strategic warheads; but by limiting missile defenses, the treaty contributed to deterrence by giving each party a reasonable guarantee it could survive a first strike from the other. As long as the United States and Russia possess strategic missiles, the ABM Treaty continues to fulfill this purpose.

Since the treaty was signed in 1972, the world has witnessed a significant increase in the number of and use of theater ballistic missiles. Despite a coordinated effort on the part of many states to limit the proliferation of ballistic missiles through the MTCR, the spread continues. Efforts to control the proliferation of chemical, biological, and nuclear warheads has produced mixed results. Until such time as it is clear that U.S. forces are not likely to face threats from theater ballistic missiles potentially armed with WMDs, as they did in the Gulf War, the United States needs to have a highly effective theater missile defense capability. Although the primary theater ballistic missile threat today is from short range ballistic missiles, several countries are developing intermediate range theater ballistic missiles that will likely be exported to other countries. The United States needs to be prepared to meet this longer range threat as it develops.

Given that the ABM Treaty did not offer a clear distinction between limited strategic ABM defenses and unrestricted TMD systems, the United States and Russia must clarify this distinction. The United States and Russia, as well as our closest allies, must accept the fact that *it is not possible to create effective TMD systems that simultaneously have no capability against strategic ballistic missiles*. Therefore, this effort to agree on mutually acceptable TMD capabilities should include confidence-building measures to help reinforce the commitment to abide by the basic purpose of the ABM Treaty.

We have discussed the fact that some states have a ballistic missile and a nuclear weapons program or both as a result of a desire to achieve world or regional prominence. Other states have similar programs in response to the threat they perceive from neighboring states. A number of countries are unlikely to agree to abandon their nuclear weapons programs as long as the NPT divides the world into “haves” and “have-nots.” In recognition of this fact, the United States should seek a more permanent long-term solution to the proliferation of ballistic missiles and nuclear weapons although a series of international discussions to establish a time frame for a ban on all ballistic missiles and nuclear weapons. This ban can be enhanced by an offer to share early warning information and TMD systems

⁷⁹. James W. Canan, “Deterrence Across the Spectrum,” *Air Force Magazine*, February 1991, p. 27.

to member states in order to reinforce each member's commitment to the ban. While this effort will not eliminate a threat from other delivery vehicles (such as aircraft, cruise missiles, and artillery), it will eliminate the most destabilizing threat of ballistic missiles. Only if the United States takes the lead in this effort and if other nuclear weapons states agree will it be likely that the threat of ballistic missiles armed with nuclear weapons will cease. Until that time, the threat will continue to grow and states will continue to take the action they believe necessary to defend their interests.

Appendix

Table 4. Countries with Ballistic Missiles of Concern to the United States

<i>Country</i>	<i>Missile</i>	<i>Range(KM)</i>	<i>Comments</i>
Afghanistan	Frog-7	70	
	Scud-B	300	
Algeria	Frog-4	50	
	Frog-7	70	
Argentina	Alacran	200	D
	Condor I	95	D
	Condor II	900	Agreed to stop production under MTCR; being dismantled
Brazil	MB/EE-150	150	D
	SS-300	300	D
	MB-EE/350	350	D
	MB-EE/600	600	D
	MB-EE/1000	1,000	D
	SS-1000	1,200	D
	IRBM	3,000	Planned
	Sonda 3	80	Sounding Rocket
Sonda 4	950	Sounding Rocket	
Bulgaria	VLS	10,000	D?
	Frog-7	70	
	Scud-B	300	
China	SS-23	500	
	M-7	180	D
	M-11	300	D
	M-9	600	D
	M-18	1,000	D
	CSS-N-3 (JL-1)	1,700	
	DF-25	1,700	D
	CSS-5 (DF21)	1,800	
	CSS-2 (DF-3)	2,800	
	CSS-3 (DF-4)	7,000	
JL-2	8,000	D	
DF-31	8,000	D	
CSS-4 (DF-5)	12,000		
DF-41	12,000	D	
Croatia	Scud-B	300	
Cuba	Frog-7	70	
Czech and Slovak Republics	Frog-7	70	
	SS-21	120	
	Scud-B	300	
Egypt	SS-23 ?	500	
	Frog-7	70	
	Scud-B	300	
	Project T	450	D
	Vector	600	D
Hungary	Scud-100	600	D
	Frog-7	70	
	Scud-B	300	
India	Centaure	50	Sounding Rocket
	Rohini	130	Sounding Rocket
	Prithvi (SS-150)		
	Prithvi (SS-250)	250	
	SLV-3	800	Space Launch Vehicle
	Agni	2,500	D
	ASLV	4,000	Space Launch Vehicle
	PSLV	8,000	Space Launch Vehicle
GSLV	12,000	Planned Space Launch Vehicle	

(continues)

Table 4. (continued)

Country	Missile	Range(KM)	Comments
Indonesia	RX-250	100	D, Sounding Rocket
	SLV (?)	1,500	Planned
Iran	Shahin-2	60	
	Nazeat	120	
	Mushak-120	120	
	Iran-130	130	
	Mushak-160	160	
	Iran-200	200	
	Mushak-200	200	D
	8610	300	
	Scud-B	300	
	Scud-C	500	
	Iran-700	700	D
Tondar-68	1,000	D	
NoDong-1 ?	1,000		
Iraq	Frog-7	65	
	Laith	90	D
	Nissan	110	D, UN resolution limits Iraq to missiles with ranges less than 150 kilometers
Israel	Mar-350	40-150	
	Lance	130	
	Jericho I	650	
	Jericho II	1,500	
	Jericho IIb	1,300	
	Shavit	2,500	Space Launch Vehicle
Japan	M-3	4,000	Space Launch Vehicle
	H-1	12,000	Space Launch Vehicle
	H-2	15,000	Space Launch Vehicle
Kuwait	Frog-7	70	
Libya	Frog-7	70	
	SS-21 ?	120	
	Scud-B	300	
	Otrag	480	
	Ittisalt	700	D
	Al-Fateh	950	D
North Korea	NoDong-1	1,000	
	Frog-5	50	
	Frog-7	70	
	Scud-B	300	
	Scud-C	500	
	NoDong-1	1,000	D
	NoDong-2	2,000	D
	Taepo Dong-1	2,000	Planned
Taepo Dong-2	3,500	Planned	
Pakistan	Haft I	80	
	Shahpar	120	Sounding Rocket
	Suparco	280	Sounding Rocket
	M-11?	280	
	Haft II	300	D
	Haft III	600	D
	??	640	Space Launch Vehicle
	SLV	1,200	Planned Space Launch Vehicle
Poland	Frog-7	70	
	SS-21	120	
	Scud-B	300	
Romania	Frog-7	70	
	Scud-B	300	
Saudi Arabia	CSS-2	2,650	

(continues)

Table 4. (continued)

Country	Missile	Range(KM)	Comments
South Africa	Jericho II	1,450	
	Arniston	1,500	
South Korea	Honest John	37	
	NHK-1	180	
	NHK-2	260	D
Serbia	Frog-7	70	
Spain	Capricornio	1,300	D
Syria	Frog-7	65	
	SS-21	120	
	Scud-B	300	
	Scud-C	500	
	M-9	600	
Taiwan	NoDong-1 ?	1,000	
	Honest John	37	
	Ching Feng	100	
	Tien Ma ?	950	
Turkey	Honest John	37	
	ASR-227	150	
United Arab Emirates	Scud-B	300	
Vietnam	Scud-B	300	
Yemen	Frog-7	65	
	SS-21	120	
	Scud-B	300	

Source: Information compiled from a variety of sources: *Arms Control Reporter* (1993): 706.E.7-11 and (1994): 706.E.1-8; *Arms Control Today* (April 1994): 29-30; Barbara Starr, "N Korea Casts a Longer Shadow with TD-2," *Jane's Defence Weekly*, 12 March 1994, p. 1; *The Military Balance 1992-1993*: 236.

Comments: This list of missiles includes sounding rockets, space launch vehicles, and missile development programs some of which may have been discontinued. All three categories are included because the technology is largely common to a ballistic missile program and thus reflects an overall capability for a given country. The list does not include Russia or any other former republics of the USSR. Missile range varies with the source.

Notes: D, in development.