Chapter 3

Ballistic Missile Defense Then and Now

Contents

Figure

Chapter 3

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INTRODUCTION

This chapter briefly reviews events and decisions of the 1960s and early 1970s which explain why the United States does not now have ballistic missile defense. It pays particular attention to the rationale of the Johnson and Nixon Administrations for ultimately declining to deploy large-scale ballistic missile defense and instead agreeing with the Soviets to severely limit it. The chapter also describes the positions of those who subsequently supported or questioned the desirability of U.S. adherence to that agreement.

With that debate over values and premises as background, the chapter then recounts some of the factors that produced the renewal of the public debate over what is now generally called "BMD," for "Ballistic Missile Defense. "

THE US. ABM PROGRAM TO 1969

In the late 1950s, the U.S. Army repeatedly sought authorization to begin producing an anti-ballistic missile (ABM) system called the Nike-Zeus.[1] The Army's goal was a nationwide defense against Soviet ICBMs. Derived from the air defense missile, the Nike-Hercules, the Nike-Zeus interceptor would have been directed by ground-based radars toward incoming Soviet missile reentry vehicles (RVs). When within range of the reentry vehicle, the nuclear weapon aboard the interceptor would explode, destroying the RV. The Eisenhower Administration resisted Army urgings of Nike-Zeus deployment, though the Army continued to win substantial support in Congress for BMD deployment.

The Kennedy Administration was unconvinced that the Nike-Zeus system—with its relatively slow rocket booster, mechanically steered radar, and limited computational capacity—would perform adequately against foreseeable Soviet ICBM threats. Moreover, Secretary of Defense McNamara's systems analysts concluded that it would cost the United States considerably more to offset Soviet missiles than it would cost the Soviets to deploy them. In addition, trying to limit damage to the U.S. population with ABM made even less sense without an extensive civil defense program, which seemed an unlikely prospect.[2] The 1963 Defense budget authorized research on a new BMD system, to be called the Nike-X. The new system would employ faster burning rockets (later called Sprint), electronically steered phased-array radars, and new computers, and would intercept incoming reentry vehicles just after they entered the atmosphere (making it easier to sort out genuine warheads from decoys).

In 1965 the U.S. Army began to develop another interceptor, the Spartan, which would detonate a nuclear warhead above the atmosphere, where it would generate intense X-rays that might be expected to knock out several incoming reentry vehicles at once. While the Sprint rocket had a limited range of about 25 miles, the Spartan had one of several hundred miles.

[1] The following survey of early BMD developments draws from Alain C. Enthoven and K. Wayne Smith, How *Much is Enough? Shaping the Defense Program, 1961-1969 (New* York: Harper Colophon, 1972), pp. 184-196; David N. Schwartz, "Past and Present: The Historical Legacy, " Ballistic Missile *Defense,* Ashton B. Carter and David N. Schwartz (eds.) (Washington, DC: The Brookings Institution, 1984), pp. 330-349; and J. P. Ruina, "The U.S. and Soviet Strategic Arsenals, " *SALT: The Moscow Agreements and Beyond,* Mason Willrich and John B. Rhinelander (eds.) (New York: The Free Press, 1974), pp. 34-65.

[2] See Fred Kaplan, *The Wizards of Armageddon (New* York: Simon & Schuster, 1983), pp. 321-324.

Photo credit U.S. Army

Army Nike-Zeus ABM interceptor in test firing. Derived from the Nike-Hercules air defense missile, the Nike-Zeus with its nuclear warhead was designed to intercept incoming ballistic missile reentry vehicles at altitudes of about 100 nautical miles. The Eisenhower and Kennedy Administrations, doubting the systems likely performance against foreseeable Soviet ICBM threats, did not support its deployment.

By the end of 1966, pressures on the Johnson Administration to deploy the Nike-X had grown strong. Evidence that the Soviets were deploying an ABM system had become unambiguous. Over Administration objections, Congress had voted money to begin U.S. deployment. The Joint Chiefs of Staff recommended to the President that the United States deploy, as a first step, the Spartan as an area defense of the whole United States and the Sprint to defend 25 cities with later expansion to cover 52 cities. This system was intended to reduce casualties in the event of full-scale nuclear war with the Soviet Union.

After hearing arguments for and against deployment in December 1966, President Johnson requested money in the fiscal year 1968 budget to permit deployment in January 1967, but postponed an actual decision pending attempts to interest the Soviets in limiting ABMs. The Secretary of Defense continued to believe that although the Nike-X might be somewhat effective against current Soviet missiles, that effectiveness would be short-lived. McNamara explained to Congress in March 1967:

> . . . the Soviets have it within their technical and economic capacity to offset any further damage limiting-measures we might undertake, provided they are determined to maintain their deterrent against us. It is the virtual certainty that the Soviets will act to maintain their deterrent which casts such grave doubts on the advisability of our deploying the NIKE-X system for the protection of our cities against the kind of heavy, sophisticated missile attack they could launch in the 1970s. In all probability, all we would accomplish would be to increase greatly both their defense expenditures and ours without any gain in real security to either sides

The Joint Chiefs of Staff were recommending deployment of a system that at least promised to be effective against *current* Soviet

'U.S. Congress, House Committee on Armed Services, *Hearings on Military Posture* 90th Cong., 1st sess., 1967, p. 874.

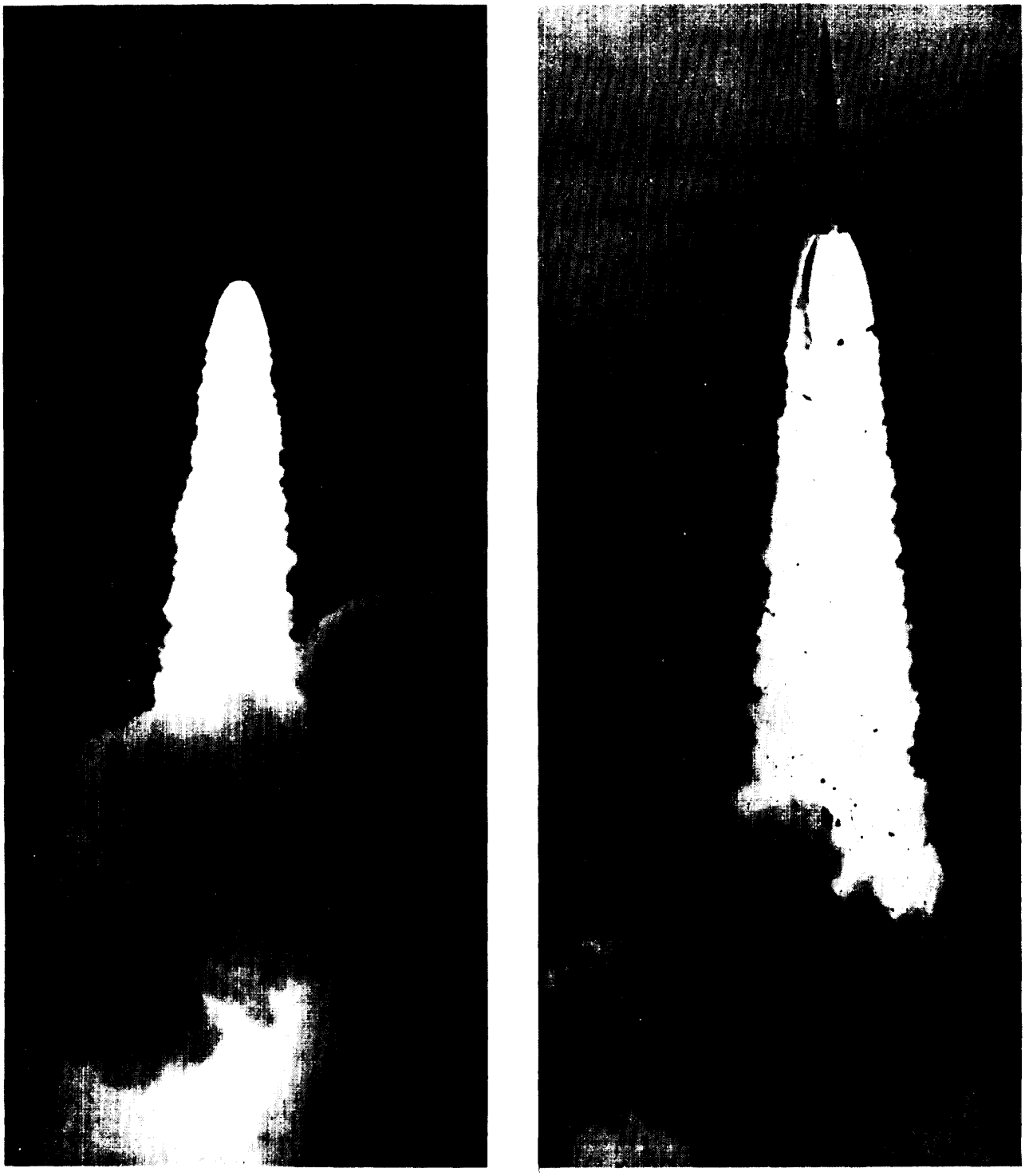


Photo credits: U.S. Army

Interceptor missiles deployed as part of the Safeguard ABM System (deactivated in 1976) defending Minuteman ICBM silos near Grand Forks, North Dakota (see photo, p. 51). The Sprint (on left) was designed as part of the Nike-X ABM program. The nuclear-armed Sprint accelerated rapidly to intercept incoming reentry vehicles after they had entered the atmosphere, making it easier to discriminate them from decoys. The Spartan (on right) was to operate above the atmosphere, where intense X-rays from its nuclear warhead were intended to knock out several reentry vehicles at once.

ICBMs, but McNamara proposed only to pursue the development, test, and evaluation of Nike-X. He also proposed that the United States initiate negotiations with the Soviet Union designed to limit the deployment of an anti-ballistic missile system. During the first half of 1967, the State Department and the White House attempted without great success to interest the Soviet Union in such negotiations.

On September 18, 1967, Secretary McNamara gave a speech in which he first explained his reasons for opposing ABM deployment, then announced that the United States would deploy a partial ABM system.[4] The rationale he offered for deployment, however, was intended to lessen congressional pressures for a large-scale system. The proposed U.S. ABM would not attempt to protect U.S. cities against a large Soviet missile attack, but instead would offer a shield against the much smaller threats of a potential Chinese ICBM fleet or an accidental Soviet attack. Even so, the Nike-X system to be deployed—called "Sentinel"-closely resembled the first stages of a system designed to defend against Soviet missiles.

As the United States prepared to deploy its ABM system, it also continued to attempt to engage the Soviets in negotiations to limit ABMs as well as offensive strategic arms. In the summer of 1968 the two countries agreed in principle to begin such negotiations, but the Soviet invasion of Czechoslovakia in August made them politically impossible. The Strategic Arms Limitation Talks (SALT) finally began under the Nixon Administration in November 1969.

Meanwhile, during 1968, senatorial and pub lic opposition to the ABM deployment began to develop. To the surprise of ABM advocates, who had expected people to welcome deployment of a system to defend them and who had expected opposition from cities not included on the initial deployment list, ABM opponents were able to mobilize opposition from groups living near the proposed deployment areas. When the Nixon Administration took office in January 1969, Secretary of Defense Melvin Laird suspended the Sentinel deployment and ordered a review of the ABM program. In March 1969, President Nixon announced plans to deploy a somewhat different system, to be called "Safeguard." The announced purpose of the Safeguard system was to defend not cities, but ICBM silos. Nixon had accepted the McNamara reasoning, explaining:

> Although every instinct motivates me to provide the American people with complete protection against a major nuclear attack, it is not now within our power to do so. The heaviest defense system we considered, one designed to protect our major cities, still could not prevent a catastrophic level of U.S. fatalities from a deliberate all-out Soviet attack. And it might look to an opponent like the prelude to an offensive strategy threatening the Soviet deterrents

Although the Spartan (exoatmospheric) missiles were no longer to be located near large cities as with Sentinel, the Safeguard system would still offer a thin area defense as well as

[4]U.S. Arms Control and Disarmament Agency, Documents *on Disarmament, 1969* (Washington, DC: U.S. Government Printing Office, 1970), p. 103.

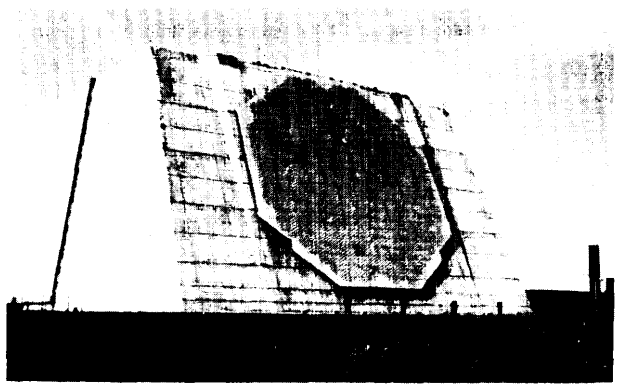


Photo credit: U.S. Army

The 12-story Perimeter Acquisition Radar (PAR) was built in northeastern North Dakota as part of the Safeguard ABM System. It was to detect and track attacking ballistic missile reentry vehicles at long-range until they were close enough to be handed over to the shorter range Missile Site Radar pictured below, p. 51. When the Grand Forks ABM site was deactivated in 1976, this PAR became part of the NORAD missile early warning system.

[3]For an explanation of the apparent paradox, see Morton Halperin, *Bureaucratic Politics and Foreign Policy* (Washington, DC: The Brookings Institution, 1974), pp. 1-7 and 297-310.

a site defense of ICBMs. The Safeguard proposals set off rounds of hearings in Congress and considerable public debate.[6] The Safeguard program narrowly missed being held up by Congress when the Senate defeated a delaying amendment in a 50-50 tie.[7]

[6]For the contrast between the Sentinel and Safeguard proposals, see Herbert F. York, "Military Technology and National Security," *Progress in Arms Control? Readings From Scientific American (San* Francisco: W.H. Freeman, 1979), pp. 45-56.

[7]Stanford Arms Control Group, *International Arms Control issues and Agreements,* 2d ed., Coit D. Blacker and Gloria Duffy (eds.) (Stanford, CA: Stanford University Press, 1984), p. 225.

SOVIET ABM PROGRAM TO 1970

The pressures—political and strategic-on the Johnson Administration in 1967 to begin deployment of an ABM system were strengthened by reports of Soviet ABM deployments.[8] Some argued that the Soviet Talinn air defense system, with its SA-5 interceptors, might be "upgraded" to ABM capability (earlier, it had been argued that the Talinn system was designed as an ABM system)[9] In 1964, during their annual May Day military display, the Soviets had paraded a larger interceptor missile, the Galosh, through Moscow. They had also begun to deploy the necessary radar systems (the so-called "Hen House" early warning radar and the "Dog House" battle management radar) and a ring of Galosh launch sites around Moscow.

As late as 1967, it may have appeared that the Galosh system, with its long-range, nuclear-armed interceptors, would be extended to other cities as well. During that year, however, only six of eight prepared sites around Moscow were under active construction. By 1969 the Soviets had halted construction of two more sites. In 1969 and 1970 they installed missiles at four sites with 16 launchers each. The Galosh system deployment stopped at 64 launchers, and even for the defense of Moscow the number was clearly inadequate to deal with the impending deployment of U.S. ballistic missiles with multiple, independently targetable reentry vehicles (MIRVs), or even to deal with a determined attack with single-warhead missiles.

[8]For more detailed descriptions of Soviet ABM programs, see Sidney Graybeal and Daniel Goure, "Soviet Ballistic Missile Defense (B MD) Objectives: Past, Present and Future," *Ballistic Missile Defense Advanced Technology Center,* contract No. DASG-60-79-C-0132, U.S. Arms *Control Objectives and the Implications for Ballistic Missile Defense,* proceedings of a symposium held at the Center for Science and International Affairs, Harvard University, Nov. 1-2, 1979, pp. 69101; Sayre Stevens, "The Soviet BMD Program," *Ballistic Missile Defense,* Carter and Schwartz (eds.), op. cit., pp. 330-349; and John Prados, *The Soviet Estimate (New* York: The Dial Press, 1982), pp. 151-171.

[9]See Prados, op. cit., pp. 160-166.

SALT I: THE ABM TREATY AND THE INTERIM AGREEMENT ON OFFENSIVE STRATEGIC ARMS

The controversies over the deployment of the U.S. Safeguard ABM system and over the degree of progress in Soviet ABM developments took place as the Nixon Administration prepared its positions for entering strategic arms limitation talks with the Soviet Union. After its own review of the issues, the Nixon Administration ended up agreeing with the Johnson Administration that it was highly desirable to attempt to limit ballistic missile defenses. By the time the negotiations began, the Soviets had apparently come to the same conclusion (after having resisted the idea in early talks with the Johnson Administration).

Provisions of the SALT I Agreements

ABM Treaty

The texts of the SALT I agreements between the United States and the Soviet Union were completed at Helsinki in May 1972.

The centerpiece of those agreements was the treaty on". . . The Limitation of Anti-Ballistic Missile Systems."[10] Each side agreed ". . . 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. . ." with certain very limited exceptions. The exceptions were that each side could deploy 100 ABM launchers within a 150-kilometer radius of its national capital and another 100 within a 150-kilometer radius of an area containing ICBM launchers. These provisions allowed the Soviets to keep the system they were building around Moscow and it allowed the United States to keep its first Safeguard installation in North Dakota.[11]

In 1974 the two sides agreed in a protocol to the treaty that each would be limited at any one time to one of the two areas provided for in the treaty. In practical terms, that meant that the Soviets would retain the system around Moscow and the United States would keep its system in North Dakota. The United States judged that the minimal effectiveness of its North Dakota installation did not justify the cost, and deactivated it in 1976. The Soviets, though allowed 100 ABM launchers around Moscow, at first kept the system at 64 and later reduced it to 32. More recently, they have begun to upgrade and expand it, possibly to the full 100 allowed launchers.

The ABM Treaty was to be of unlimited duration: the parties agreed that the defense of most of their national territories against strategic (long-range) ballistic missiles would be banned until one or both decided to abrogate or seek to amend the treaty. In order to keep the treaty up to date, a review was provided for every 5 years. In addition, the treaty created a Standing Consultative Commission where the two sides could discuss not only matters of compliance with the treaty, but "possible proposals for further increasing the viability" of the treaty, "including proposals for amendments." It also stated that each side had the right to withdraw from the treaty, with 6 months' notice, ". . . if it decides that extraordinary events related to the subject matter of this Treaty have jeopardized its supreme interests."

The two parties agreed that "in order to insure fulfillment of the obligation not to deploy ABM systems . . . in the event ABM systems based on other physical principles . . . are created in the future, specific limitations on such systems and their components would be subject to discussion in accordance" with the provisions for the Standing Consultative Commission and for amendments.

Interim Agreement

When they signed the ABM Treaty, President Nixon and Secretary Brezhnev also signed an "Interim Agreement . . . on Certain Measures With Respect to the Limitation of Strategic Offensive Arms." This agreement froze the number of kind-based ICBM launchers on each side and set ceilings on the numbers of SLBM launchers each could deploy (up to the limits, land-based ICBM launchers could be "traded in" for SLBM launchers). The Interim Agreement on offensive forces expired in 5 years, although the two sides continued to observe it as SALT II negotiations extended on for 7 years.

Implications and Aftermath of SALT I

Points of view on the original desirability and subsequent success of the ABM Treaty vary widely. Supporters of the treaty believe that the treaty enhanced U.S. security, though they differ in the degree of dissatisfaction they feel with the offensive limitations agreed upon in SALT I and SALT II. Some critics of continued adherence to the ABM Treaty do not quarrel with the original idea of the agreement, but

[10]For the full text of the treaty and associated agreed and unilateral statements, see app. B.

[11]For a detailed analysis of the ABM Treaty Provisions, see George Schneiter, "The ABM Treaty Today," *Ballistic Missile Defense,* Carter and Schwartz (eds,), op. cit, pp. 221-250; John B. Rhinelander, "The SALT I Agreements," *SALT: The Moscow Agreements and Beyond,* Willrich and Rhinelander (eds.), op. cit., pp. 125-159; and U.S. Congress, Office of Technology Assessment, Arms *Control in Space: Workshop Proceedings, OTA-BP-ISC-28* (Washington, DC: U.S. Government Printing Office, May 1984), pp. 33-34.

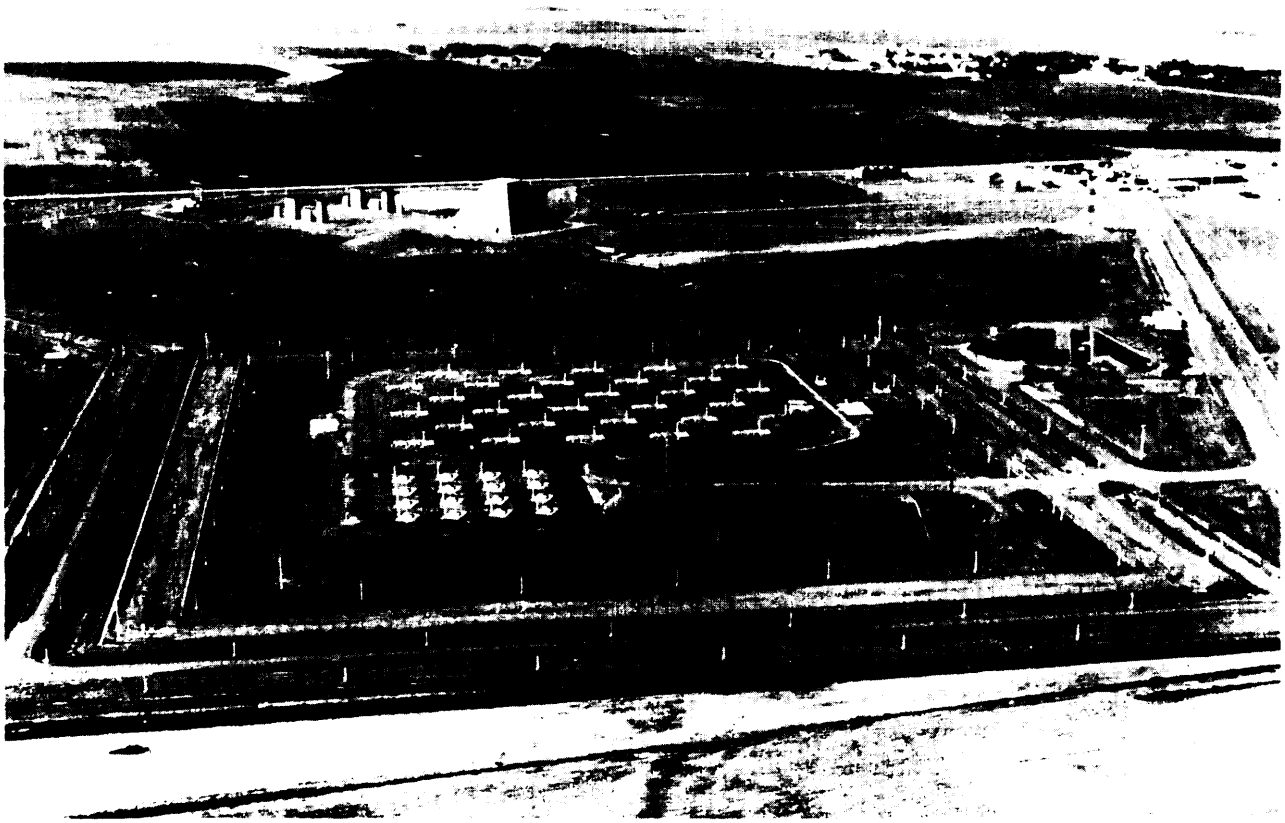


Photo credit U.S. *Army*

The Missile Site Radar (background) of the Safeguard ABM System was designed to refine the data received from the long-range Perimeter Acquisition Radar, track the attacking ICBM reentry vehicles, and fire Sprint and Spartan interceptor missiles (in cells, foreground), to intercept them. Though this site was permitted under the 1972 ABM Treaty and its 1974 protocol, the United States decided that its limited capabilities did not justify the cost and deactivated the system in 1976.

believe that subsequent U.S. policy overly neglected U.S. BMD research while too gently tolerating possible Soviet violations of the agreement. Other critics tend to believe that the very premises under which the treaty was entered into were erroneous.

Supporters

Supporters of the ABM Treaty believe that the agreement was basically "stabilizing," in the senses both of "arms race stability" and "crisis stability. " Proponents of limiting BMD have argued that anti-missile defenses would "destabilize" the offensive arms race by stimulating the opponents to build up their offensive forces in order to try to overcome the enemy defenses. Recall Secretary McNamara's belief in the ". . . virtual certainty that the Soviets will act to maintain their deterrent. . ." and President Nixon's conclusion that BMD might look to an opponent like the prelude to an offensive strategy threatening the Soviet deterrent. " This reasoning led, conversely, to the idea stated in the ABM Treaty that limiting ABMs would be a "substantial factor" in curbing the offensive arms race.

Ballistic missile defense, said ABM Treaty supporters, might also induce "crisis instabil-

ity ” by affecting the structure of incentives before the two sides in a confrontation. Nobody seriously believed in 1972 that a BMD system could limit the damage from a nuclear war to “acceptable” levels, and thus make the possessor of a BMD system less afraid of nuclear war. However, even a less capable BMD system might offer an incentive to attack first if its owner believed that nuclear war had become inevitable and that damage could be kept acceptably low only if the other side's forces had first been substantially weakened by a “counterforce” blow. An even more subtle destabilizing effect of owning a BMD system might be to induce in the *other* side the expectation that one intended to strike first, and therefore gave him an incentive to preempt that first strike by going first himself. Such reasoning that ABMs might increase the risk of nuclear war, then, led to the premise in the ABM Treaty preamble that limiting ABMs would decrease it.

Some supporters of the treaty agree that its effects on limiting the offensive arms race are difficult to discern. As one observed in 1974,

> To the great disappointment of many of the strongest supporters of the ABM Treaty, its conclusion has not resulted in the noticeable slowdown in strategic offensive weapons programs that would have been expected according to the action-reaction theory. Even U.S. MIRV programs, which had been specifically rationalized as being required to penetrate possible Soviet ABM defenses, are proceeding without change. It has become increasingly clear that strategic weapons programs have the bases for their support in a multiplicity of interests and that, once underway, expedient and changing rationales will be used to sell them. '2

It is difficult to identify an offensive strategic weapons program on either side which was stopped by any provision of either the SALT I or the SALT II agreements. During the early and mid-1970s the United States more than doubled the deliverable strategic nuclear warheads in its arsenal (though the total nuclear weapons inventory and the size of individual strategic warheads dropped from the 1960s). Much of the numerical increase came in the form of submarine-launched ballistic missile (SLBM) warheads, which were too inaccurate to threaten Soviet ICBM silos, but which were also invulnerable to a Soviet preemptive first strike. The Soviets, meanwhile, had built a lead in numbers of SLBM and ICBM launchers and in the carrying capacity of the missiles in those launchers. In the mid to late 1970s, the addition of multiple reentry vehicles to their large ICBMS multiplied their strategic warhead count severalfold. That large force, coupled with increased accuracy of the reentry vehicles, appeared to threaten a substantial portion of the U.S. ICBM silos (see figure 3-1). By most static measures of strategic nuclear force, the Soviets were taking a lead.[13]

On the other hand, we have no way of knowing whether the offensive competition might not have been even more vigorous than it was if each side had been attempting to guarantee the penetration of its forces against substantial ballistic missile defenses on the other side. The only way of testing that proposition would have been to forgo the treaty. In any case, we have at least avoided the costly deployment of BMD systems which, many would argue, would have provoked offensive countermeasures and would have been technically ineffective at the same time.

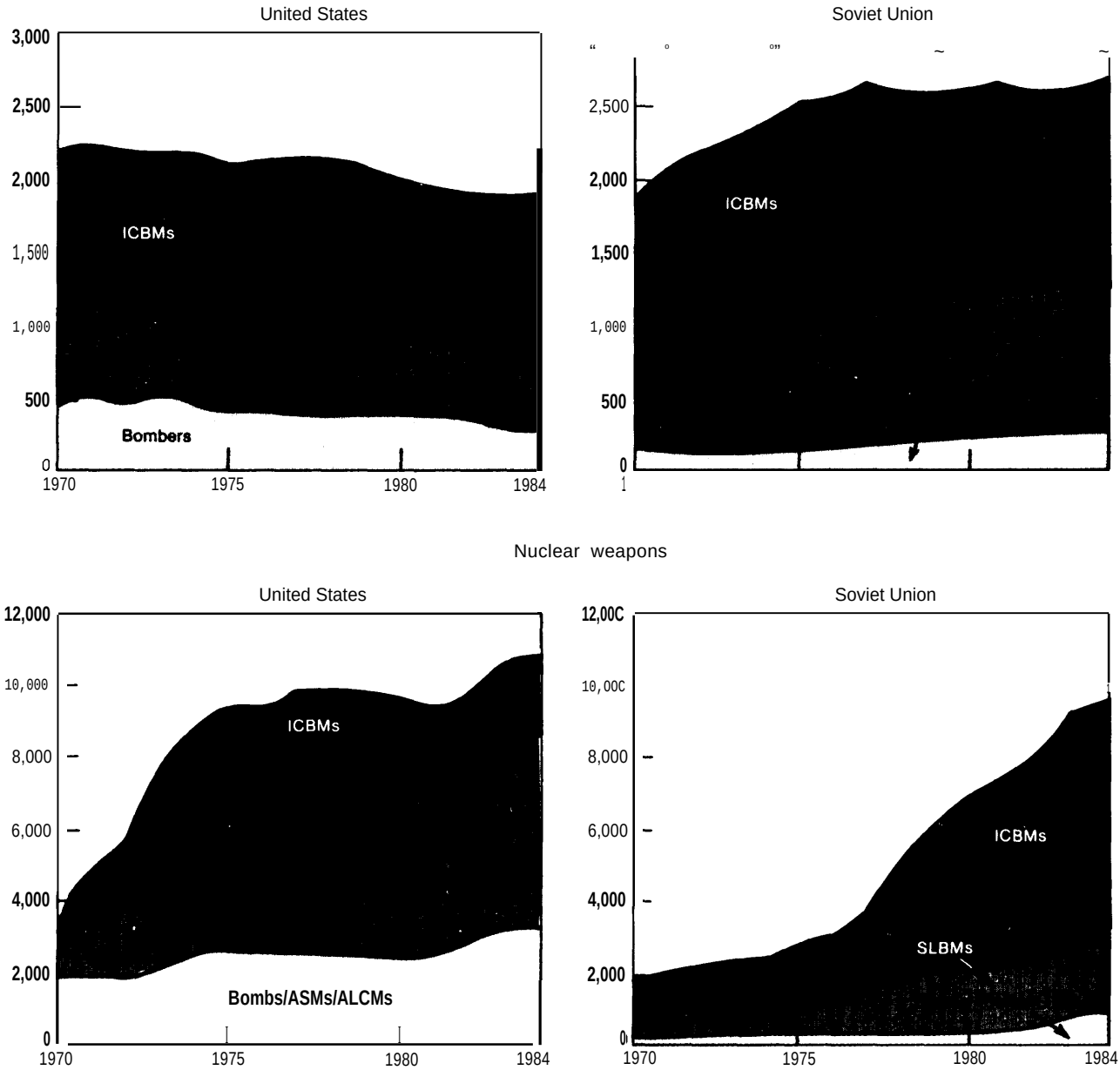
Supporters of the ABM Treaty also see it as a significant step in a larger process of arms control negotiation between the United States and the Soviet Union. SALT I led to SALT II, SALT II was to lead to SALT III, and so on. The SALT process seemed to be one sign of a recognition by both sides that cooperative action to reduce the likelihood of nuclear war is desirable. Abandonment of the ABM Treaty, would, conversely, signify to some a retreat from that recognition.

Supporters of the ABM Treaty agree that Soviet violations of the treaty must be dealt with firmly if the treaty and the arms limita-

[12]George W. Rathjens, “Future Limitations of Strategic Arms, ” Willrich and Rhinelander (eds.), op. cit., p. 228.

[13]Cf. U.S. Department of Defense, Soviet Military *Power,* 1985, pp. 25-41.

Figure 3-1 .— U.S. and Soviet Strategic Forces, 1970.1984



U.S. and Soviet strategic nuclear warheads both increased in the 1970s and 1980s, but the composition of forces on the two sides differed. The United States maintained a substantial fraction of its warheads as bombers and air-to-surface missiles while it added many multiple, independently targetable reentry vehicles (MIRVs) to its SLBM force. The Soviets added SLBM warheads, but concentrated on deploying many, relatively large, warheads on increasingly accurate ICBMS.

SOURCE Congressional Research Service

tion process are to survive. Some argue that such firmness should have been exercised much sooner. But they argue that the chances of successfully enforcing Soviet compliance would be much better in the context of a clear U.S. intent to strengthen arms control rather than in a context of public threats to abandon the arms control process.[14]

The policy of every Administration since 1972, including the present one, has been that adherence to the ABM Treaty has been, on balance, in the national security interest of the United States. The Reagan Administration has stated that Strategic Defense Initiative research will be carried on within the limits of the treaty. There are, however, critics of the treaty within the Administration. The following section offers a range of critical views of the ABM Treaty, but does *not* describe current Administration policy.

Critics

Various critics of the ABM Treaty disagree with the proponents on almost every count. Some believe that SALT I slowed the pace of the U.S. strategic force modernization programs since 1972 while the deployments of Soviet ICBMs and SLBMs in the same period could hardly have been higher even in the presence of U.S. BMD and the absence of the modest offensive limitations in SALT I and SALT II. They point out that many in the United States had hoped in vain that SALT I would prevent the Soviets from acquiring the ability to threaten destruction of substantial numbers of U.S. land-based ICBMs in a preemptive nuclear strike. In a unilateral statement attached to the ABM Treaty; the United States declared its belief that:

> . . . an objective of the follow-on negotiations should be to constrain and reduce on a long-term basis threats to the survivability of our respective strategic retaliatory forces,

Moreover, the Jackson Amendment to the joint resolution of approval of the SALT I Interim Agreement (H.J.R. 1227, Sept. 30, 1972) stated that Congress considered that:

> . . . the success of the interim agreement and the attainment of more permanent and comprehensive agreements are dependent upon the preservation of longstanding United States policy that neither the Soviet Union nor the United States should seek unilateral advantage by developing a first strike potential[15]

Critics of the ABM Treaty argue that seeking first strike potential is exactly what the Soviets have been doing. In their view, the Soviets have always rejected the notion that they should be deterred by the U.S. retaliatory capability. Instead, the Soviets believe they should actively pursue the capability to fight and win a nuclear war with acceptable losses to the Soviet economy, society, political regime, and military forces. In this view, Soviet war plans call for a preemptive first-strike against U.S. land-based ICBMs, bombers on the ground, and submarines in port. Extensive Soviet air defenses and civil defense would protect key Soviet industrial, political, and military targets from a weakened U.S. retaliatory strike.

Critics of the ABM Treaty believe that, although Soviet ballistic missile defenses could limit damage to the Soviet Union even further, the Soviets nevertheless decided to forgo them because they feared that U.S. technology would produce a greatly superior BMD system. Now that they have used the treaty to slow U.S. BMD developments while pushing ahead with their own, they may soon be ready clandestinely or openly to deploy BMD systems, which, though not perfect, would complement their damage-limiting strategy. Indeed, in this view, evidence of Soviet cheating on the ABM Treaty (as well as other arms control agreements) suggests that the Soviets are already set on that course. " Many treaty critics believe that, lulled into a false sense of

[14] Cf. Michael Krepon, "Both Sides Are Hedging, " *Foreign Policy, No. 56,* fall 1984, pp. 153-172.

[15] Stanford Arms Control Group, op. cit., 249.

[16] For a discussion of Soviet cheating and recommended U.S. responses to it, see Colin Gray, "MOSCOW Is *Cheating, " Foreign Policy,* fall 1984, pp. 141-152.

security by the SALT agreements, the United States failed to make necessary efforts in air defense, civil defense, ballistic missile defense, and offensive force modernization. Some go so far as to conclude that the resulting asymmetry in U.S. and Soviet strategic capabilities

> . . . virtually guarantees that in case of a nuclear war the U.S. will suffer defeat and probably suffer annihilation as a functioning society while the Soviet Union and its system will survive and with sufficient power intact to establish the world hegemony that its leadership has always considered its ultimate due. '7

In these circumstances, far from enhancing crisis stability, the ABM Treaty has contributed to increasing Soviet incentives to nuclear risk-taking:

> the U.S. lack of strategic defense considerably reduces the credibility of U.S. deterrence in Soviet eyes and may facilitate a Soviet belief in safe expansion. As a result, in crisis situations the Soviets may consider themselves less restrained than the United States and act accordingly .18

In this view, then, arms control has led to naive inaction on the part of the United States and the attainment of strategic superiority by the Soviet Union. What the United States should do is pursue nuclear war-fighting capabilities, including offensive counterforce capabilities, air defense, civil defense, and ballistic missile defense, that will give it a credible "theory of victory" with which to deter Soviet aggression. [19]

Others argue that while limiting ballistic missile defense may have been a reasonable policy when the available technology was more primitive, new technologies call for new policies. They say that at the very least, the addition of ballistic missile defenses could enhance the current U.S. deterrent posture. And some suggest that defenses might permit a dramatic change in strategy from offensive to defensive emphasis.

We return in chapter 4 to the question of what it might take to deter the Soviets.

[17] Michael J. Deane, *Strategic Defense in Soviet Strategy* (Miami, FL: Advanced International Studies Institute, 1980), p. 114.

[18] Ibid,

[19] Cf. Colin Gray, "Nuclear Strategy: The Case for a Theory of Victory," International *security*, vol. 4, No. 1, summer 1979, pp. 54-87.

THE CURRENT BALLISTIC MISSILE DEFENSE DEBATE

Strategic Nuclear Forces: The ICBM Vulnerability Issue

As the Soviets added MIRVed missiles to their ICBM force during the late 1970s, the Defense Department was predicting that the growing numbers of more accurate Soviet ICBM warheads would place the U.S. land-based ICBMs at increasing risk of destruction in a preemptive strike. By the early to mid-1980s, some argued, the United States would have entered a "window of vulnerability" in which 90 percent or more of its land-based ICBMs could be destroyed within minutes.

There has been considerable debate, though, over how significant this problem is and what to do about it. Some argued that the Soviets would have open to them the possibility that they could launch a preemptive strike on U.S. ICBMs and on U.S. bomber bases (as well as on many missile carrying submarines in port), leaving the U.S. President with only the less accurate SLBM weapons to retaliate, perhaps mainly against Soviet cities. Since this choice would then bring about the destruction of U.S. cities in counter-retaliation, the argument went, the President would have a strong incentive to withhold retaliation and capitulate to whatever Soviet demands followed the Soviet strike. Given this theoretical first-strike capability, the Soviets would be inclined to attempt nuclear intimidation of the United States and might succeed without ever having to fire a missile.

Critics of this point of view argued that:

1. the Soviets could, for various reasons, have little confidence that they could exe cute this partially disarming first strike successfully; [20]
2. a "surgical" strike against U.S. missile, bomber, and submarine bases is not possible—millions would be killed and the Soviets could not count on U.S. restraint in retaliation; and
3. U.S. SLBMs and bombers would be capable of damaging a great variety of Soviet military, political, and economic targets-the President would not be limited to retaliating against urban populations.

The Carter and Reagan Administrations took positions which implied that the ICBM vulnerability issue was important but not urgent. The Carter Administration proposed deploying a new ICBM, the MX, which would be based deceptively among multiple protective structures so as to raise the price in warheads of a Soviet attack to unacceptable levels. The fully deployed system was scheduled to restore relative invulnerability to land-based ICBMs in about 1989.

Rejecting the Carter Administration's multiple protective structure basing mode, the Reagan Administration first explored alternate "survivable" basing modes, then referred the ICBM issue to a "President's Commission on Strategic Forces, " chaired by Brent Scowcroft. The Scowcroft Commission recommended the deployment of 100 MX missiles in fixed, presumably vulnerable, silos now occupied by Minuteman missiles. It also recommended development of a small, possibly mobile, ICBM that might reduce the ICBM vulnerability problem sometime in the early 1990s.[21] At various times during the course of debate over ICBM vulnerability, ballistic missile defense had been suggested as a measure for protecting the missiles.[22] The Scowcroft Commission

[20] Some argue that imputations of the required degrees of accuracy to Soviet reentry vehicles are, for various technical reasons, not justifiable and that the Soviets would be foolish to have confidence in a theoretical, basically untestable, capability. In addition, Soviet ICBMs could not attack U.S. ICBMs without giving U.S. bombers enough warning to become airborne. Furthermore, the Soviets must take into account the possibility that U.S. ICBMs would be launched on warning, escaping before the Soviet ICBMs arrived. For many years it has been U.S. policy to have a capability to launch on warning. Although we have no declared policy to do so, the possibility that we might is a part of our deterrent posture. See U.S. Congress, Office of Technology Assessment, MX missile *Basing,* OTA-ISC-140 (Washington, DC: U.S. Government Printing Office, September 1981), for a discussion of the technical requirements for launch-on-warning. (On the other hand, some argue that an attack of shorter range, submarine-launched missiles producing nuclear detonations above the U.S. missile fields could pin the missiles down until the Soviet ICBMs arrived.)

[21] *Report of the President Commission on Strategic Forces* (April 1983), reprinted in U.S. Congress, House Committee on Armed Services, *Defense Department Authorization and Oversight, Hearings on H.R. 2287, Department of Defense Authorization for Appropriations for Fiscal Year 1984 and Oversight of Previously Authorized Programs, Part 2 of 8 Parts, Strategic Programs,* 98th Cong., 1st sess., 1983, pp. 33-62.

[22] For a discussion of the technical issues, see U.S. Congress, Office of Technology Assessment, MX Missile *Basing,* op. cit., pp. 109-143.

Photo credit: U.S. Air Force

Artist's concept of a new small intercontinental ballistic missile (SICBM) now under research and development by the U.S. Air Force. In this design, the missile would be about 46 feet long and weigh about 30,000 lbs. It would deliver a 1,000 lb payload at ranges in excess of 6,000 miles. The President's Commission on Strategic Forces, appointed by President Reagan and chaired by Brent Scowcroft, recommended deployment of a small, possibly mobile ICBM that might alleviate the ICBM vulnerability problem in the early 1990s.

concluded, however, that the vulnerability of the Minuteman and MX silos

> . . . in the near term, viewed in isolation, is not a sufficiently dominant part of the overall problem of ICBM modernization to warrant other immediate steps being taken such as closely spacing new silos or ABM defense of those silos.[23]

Some proponents of ballistic missile defense, however, disagree. They say that the immediate goal of pursuing ballistic missile defense should be to reduce or eliminate the "military utility" of Soviet ICBMs, which, presumably, means their ability to destroy a large number of ICBM silos as well as other hardened military targets. Indeed, the defense of ICBMs became the major focus of U.S. BMD research through the late 1970s and early 1980s.

Technological Developments

"Conventional" BMD

In the years since the signing of the ABM Treaty, the United States has continued research on ballistic missile defense technology. Although some work was conducted on "exotic" technologies with possible long-term application, the major focus was on systems that might be deployed within a few years in response to a Soviet "breakout" from the ABM Treaty. The systems to which most attention was paid were designed primarily to partially defend hard targets, such as ICBM shelters, against "counterforce attacks. The goal would not be to protect every single shelter perfectly but to try to assure the survival of adequate retaliatory forces after a Soviet first strike by raising the "price" of successful attack on U.S. ICBMs to levels the Soviets would not want to pay. ("Price" here is measured as either a percentage of available Soviet missile forces or the financial and political cost of deploying additional forces.)

The Army Ballistic Missile Defense Program Office developed some subsystems for a successor to the Sprint missile component of the old Safeguard system: the Low Altitude Defense System, or LoADS. The LoADS would

[23] Ibid., p. 51. For further discussion of the Scowcroft Commission findings, see ch. 6 of this report.

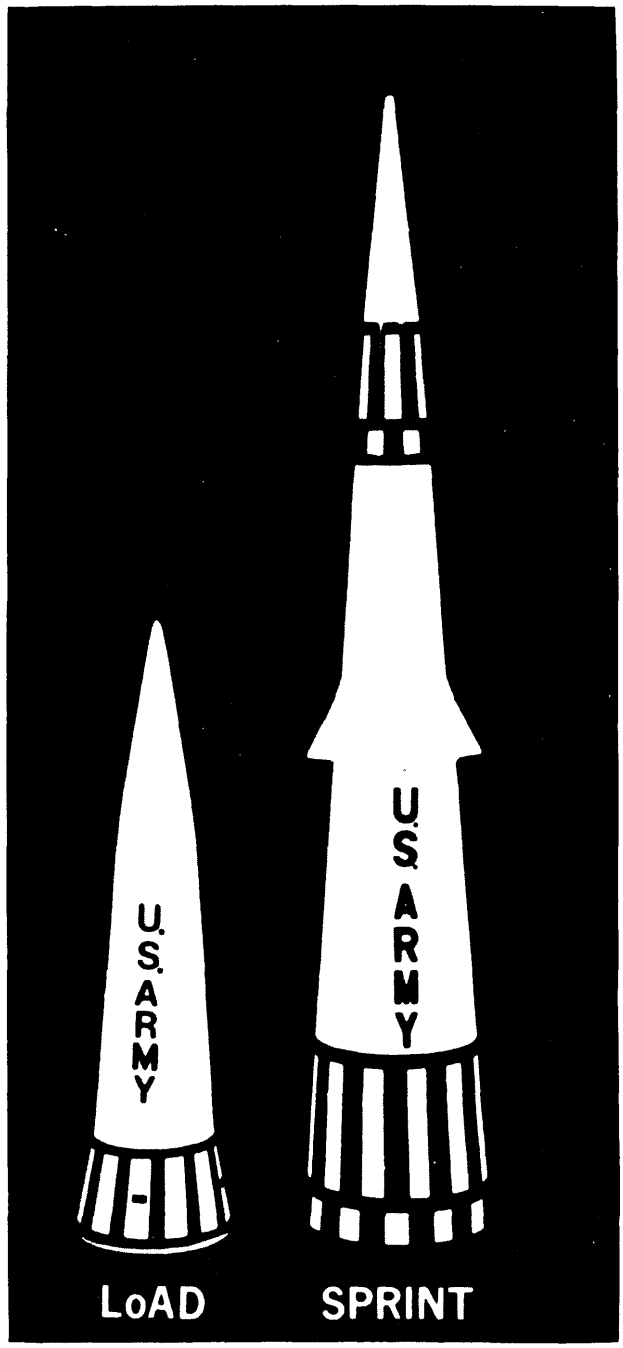


Photo credit: *US Army*

In the 1970s and early 1980s, the Army developed the Low Altitude Defense System (LoADS) as a successor to the Sprint ABM interceptor and its associated Missile Site Radar (see photos above, pp. 47 and 51). It would have used small, possibly mobile, short-range phased-array radars and computers to direct small, nuclear-armed missiles to intercept incoming reentry vehicles after they had entered the atmosphere. Because nuclear explosions would occur so close to the ground, these weapons would have been suitable for protecting only hardened targets such as ICBM shelters.

use small, possibly mobile, short-range phased-array radars and computers to direct small missiles carrying nuclear warheads to incoming enemy reentry vehicles after they had entered the atmosphere. Because nuclear explosions would occur so close to the ground, these weapons would have been suitable for protecting only hardened targets such as ICBM shelters.[24] The Army has also worked on an endoatmospheric (inside the atmosphere) nonnuclear kill missile for the LoADS, but has not established its feasibility.[2K]

The Army has also been developing a nonnuclear exoatmospheric (above the atmosphere) interceptor. A sensor and kill vehicle (which collides with the incoming reentry vehicle) were demonstrated in a test of the Homing Overlay Experiment held in the summer of 1984. A full-blown system with many such interceptors would probably use missile-borne or airborne optical (long-wave infrared) sensors to detect and track the numerous incoming reentry vehicles, and would need to be able to discriminate between warheads and decoys.

The Army has argued that while either the LoADS or the high-altitude system could work well standing alone, they could be even more effective if deployed together in a "layered" defense.[2e]

Newer Technologies Potentially Applicable to BMD[27]

Those who advocate greater efforts now in BMD research and development argue that technical advances since the early 1970s point the way to solving many or all of the technical problems that made BMD less attractive when the ABM Treaty was signed.

Technological limits of the late 1960s and early 1970s made it seem that BMD systems could be of only limited effectiveness and that it would likely be less costly to improve the ability of offenses to penetrate defenses than it would be to build the defenses in the first place. The systems under development were limited to ground-based interceptors that would operate during the last few minutes of the offensive trajectory, in the terminal phase, and in late midcourse. Guidance would have been provided by large radars located at or near the interceptor launchers. The radars, vulnerable to attack, would themselves have been prime targets for the offense. Proliferation of the radars would have been difficult because they had to be large and expensive.

The speed and capacity of available computers limited the ability of the radars to operate successfully in a complicated environment and of automated battle management systems to handle large attacks. It would have been very difficult to discriminate targets from decoys or other penetration aids. This problem would have forced either the commitment of very large numbers of interceptors to kill comparatively few targets, or the delay of any attempt at intercept until the incoming warheads entered the atmosphere, where discrimination becomes easier. Either would have put a substantial strain on data handling and weapon resources. This situation limited the range at intercept, and therefore the area each site could protect, forcing up requirements for numbers of interceptors.

Guidance and warhead technology had not yet made it feasible to consider trying to use nonnuclear warheads to destroy missile reentry vehicles. Nuclear explosions threatened collateral damage problems which further limited the region over which the intercept could take place.[28] They also posed the risk of blackout of the radars once the first intercept was

[24]Such systems are apparently not being considered under the Strategic Defense Initiative.

[25]Such low-altitude nonnuclear interception could still not assure protection of soft targets like cities because the incoming warheads could be salvage-fused-i. e., designed to detonate at the moment of impact with the interceptor.

[26]See William A. Davis, Jr., "Current Technical Status of U.S. BMD Programs," *U.S. Arms Control Objectives and the Implications for Ballistic Missile Defense,* op. cit., pp. 37-40.

[27]Much of the basic material comes from the unclassified version of the DOD Defensive Technologies Study, submitted to Congress March 1984, and from a recent paper by James Fletcher, the leader of that study (James C. Fletcher, "The Technologies for Ballistic Missile Defense," Issues *in Science and Technology,* fall 1984).

[28]Again, if the incoming warheads were salvage-fused, the collateral damage might be greater from the the intercepted warhead than from a nuclear interceptor.

made. Analyses showed that the cost of relatively easy countermeasures—e.g., adding to the offensive forces or even just adding crude decoys–would be less than the cost of building the BMD systems.

For some, technical advances of recent years suggest solutions to the problems previously limiting the promise of ballistic missile defense. The advances are, for the most part, more embryonic than mature. They will have to be further proven, and in many cases vastly scaled up from present performance levels, before they can be designed and engineered into working BMD weapon components. Nevertheless, advocates of greater investment in the development of these technologies believe they offer the promise of building weapons with nonnuclear kill mechanisms; weapons that could attack missiles in their boost and midcourse phases; sensors, computers, and, especially, software for high-speed, high-volume target tracking and discrimination; and computers and software for high-capacity battle management. The new technologies are discussed in detail in chapters 7 and 8.

Soviet BMD Activities

Meanwhile, in the early 1980s, Soviet BMD developments were giving U.S. officials some cause for concern. According to the Department of Defense document, *Soviet Military Power,* 1985, since 1980 the Soviets have been upgrading the Moscow ABM system from 64 launchers to the 100 allowed by the ABM Treaty:

> When completed, the new system will be a two-layer defense composed of silo-based long-range modified GALOSH interceptors designed to engage targets outside the atmosphere; silo-based high acceleration interceptors designed to engage targets within the atmosphere; associated engagement and guidance radars; and a new large radar at Pushkino designed to control ABM engagements. The silo-based launchers may be reloadable. The first new launchers are likely to be operational this year [1985], and the new defenses could be fully operational by 1987.[29]

In addition, "the Soviets have developed a rapidly deployable ABM system for which sites could be built in months rather than years. " Soviet early warning and tracking radars, including one site under construction which violates the ABM Treaty, could support an "ABM deployment to protect important target areas in the U. S. S. R." in the next 10 years. Another hypothesized addition to such a system would be the SA-10 (under deployment) and SA-X-12 (under development) surface-to-air missiles which "may have the potential to intercept some types of U.S. strategic ballistic missiles. "[30]

According to the Department of Defense report, then, the Soviets are "developing a rapidly deployable ABM system to protect important target areas in the U. S. S. R." The report concludes that "the aggregate of [their] ABM and ABM-related activities suggests that the U.S.S.R. may be preparing an ABM defense of its national territory. ''[31] Officials of the CIA, however, have said that they do not judge it likely that the Soviets would in fact move to such a deployment in the near term.[32] These officials point out that, while the Soviets could expand their presently limited ABM system by the early 1990s,

> In contemplating such a deployment . . . [they] will have to weigh the military advantages they would see in such defenses against the disadvantages they would see in such a move, particularly the responses by the United States and its allies.[33]

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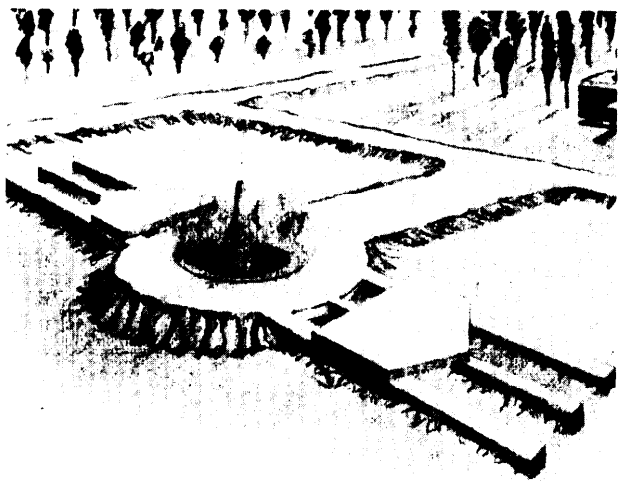
[29] *Soviet Military Power 1985* (Washington, DC: U.S. Department of Defense, 1984), p. 48.

[30] "I bid.

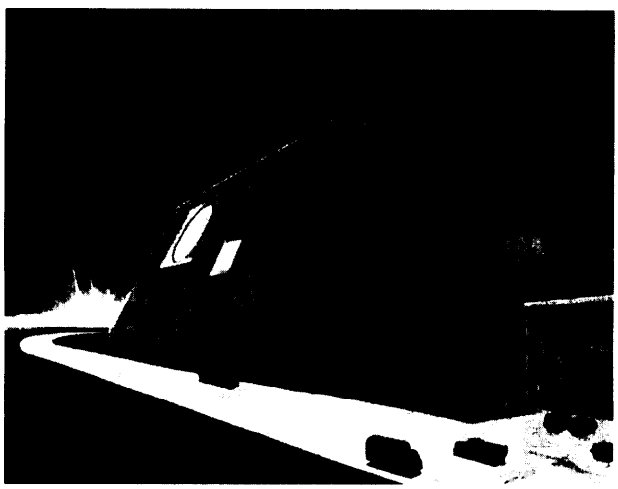
[31] "Ibid.

[32] "Unclassified testimony of National Intelligence Officer Lawrence K. Gershwin before a joint session of the Subcommittee on Strategic and Theater Nuclear forces of the Senate Armed Services Committee and the Defense Subcommittee of the Senate Committee on Appropriations, June 26, 1985.

[33] Prepared testimony of Robert M. Gates and Lawrence K. Gershwin, ibid.



Moscow Ballistic Missile Defense



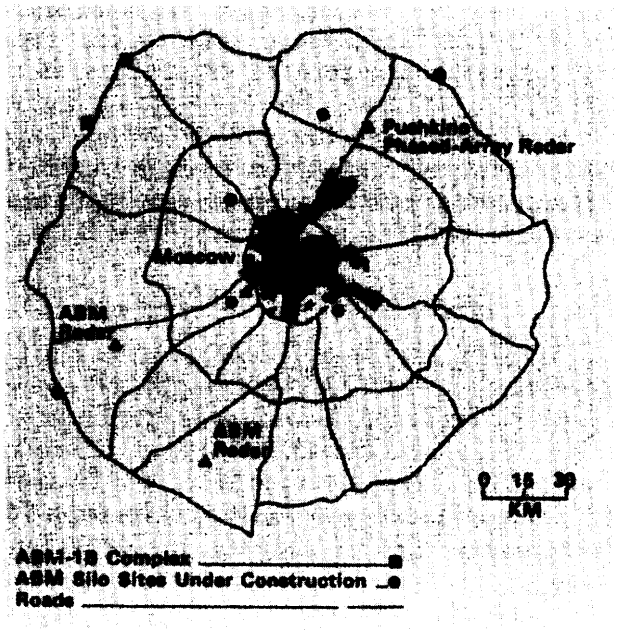


Photo credit: U.S. Department of Defense

The Moscow ballistic missile defenses identified in the map at right include the Pushkino ABM radar, above, Galosh anti-ballistic missile interceptors, top left, and new silo-based high-acceleration interceptors, top right.

The Defense Department also reports that the Soviets are working on ground-based lasers for ballistic missile defense, although "initial operational deployment is not likely in this century. "3[4] They also have a "vigorous program underway for [ground- and space-based] particle beam development and could have a prototype space-based weapon ready for testing in the late 1990s."[35] The CIA, on

"The CIA says:

> We are concerned about a large Soviet program to develop ground-based laser weapons for terminal defense against reentry vehicles. There are major uncertainties, however, concerning the feasibility and practicality of using ground-based lasers for BMD.

Testimony of Gates and Gershwin, prepared testimony, ibid.

[36]1 bid., p. 44.

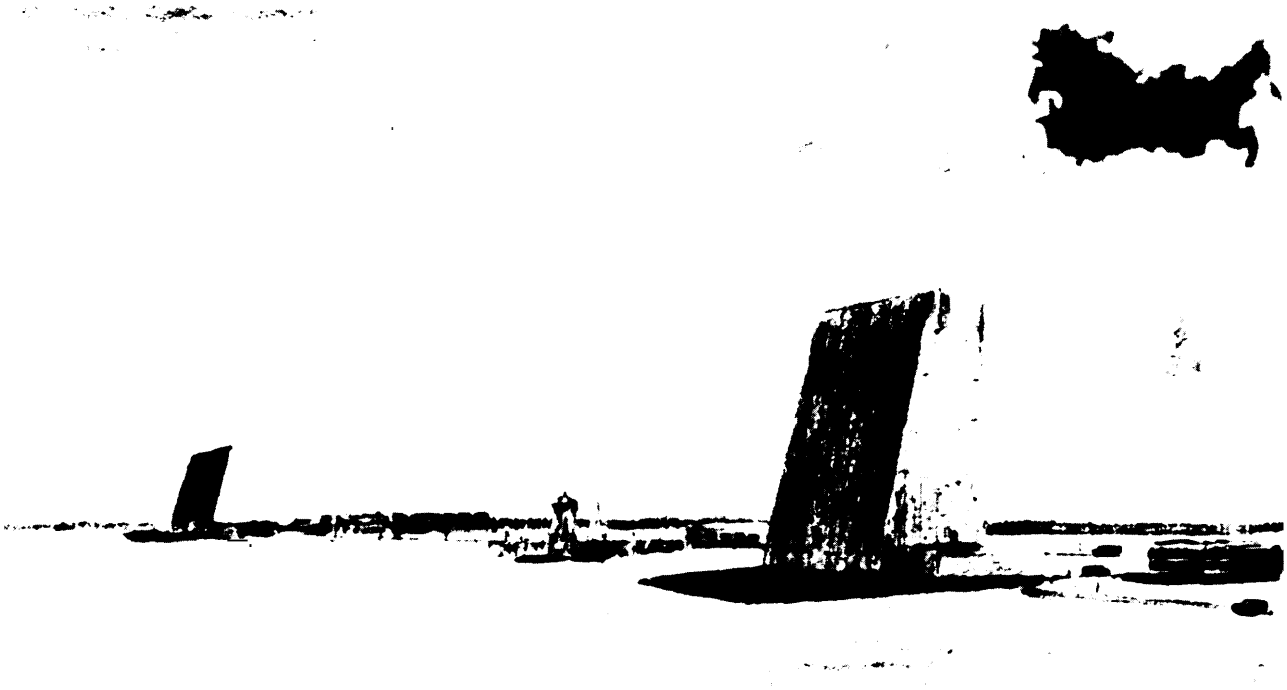


Photo credit: US. Department of Defense

Artist's concept of large phased-array early warning and missile tracking radar under construction at Krasnoyarsk in the Soviet Union. The U.S. Government has judged this radar to violate the ABM Treaty because of its siting, orientation, and capability.

the other hand, estimates that the "technical requirements are so severe" that there is a "low probability" that the Soviets will test such a prototype before the year 2000.[36] The Soviets are also reported to be working on particle beam weapons.

Soviet BMD developments, then, lead some to project either of two threatening possibilities, One is that the Soviets might decide formally (or at least overtly) to abandon the ABM Treaty and rapidly deploy ballistic missile defenses that gave them a strategic advantage over the United States before it could respond adequately. This possibility is sometimes referred to as a "break out" from the treaty. The second threatening possibility is that the Soviets might "creep out" of the treaty. That is, they might feign adherence to the ABM Treaty but gain a significant unilateral ballistic missile defense capability through treaty violations and through technical advances in systems (e.g., theater ballistic missile defenses) nominally permitted by the treaty.

Political Developments

Decline of Detente

In 1972, when the Nixon Administration signed the SALT I agreements, U.S. policy toward the Soviet Union was one of detente, in which the United States was attempting to ameliorate its adversarial relationship with the Soviet Union through various cooperative arrangements, including but not limited to arms control. According to one of the architects of this policy, a "network of agreements" was meant to provide "incentives and penalties" that might "moderate Soviet behavior. "[37] Although arms control negotiations between the two superpowers continued through the 1970s, during the same period U.S.-Soviet cooperation declined and conflict increased. The So-

[36] Testimony of Gates and Gershwin, **Op. cit.**

[37] Henry A. Kissinger, Years *of Upheaval* (Boston: Little, Brown & Co., 1982), p. 246.

viet invasion of Afghanistan in late 1979 led the Carter Administration to withdraw the signed SALT II treaty from senatorial consideration. The Reagan Administration came to office with a stated intent of correcting what it saw as the undue softness of previous Administrations toward the Soviets and serious neglect of U.S. military strength. Harsh Soviet reaction to political liberalization in Poland and Soviet destruction of a Korean airliner that had strayed over Soviet air space did not improve Soviet standing in U.S. eyes.

Decline of Arms Control

During his 1980 election campaign President Reagan emphasized that the SALT II accords signed by the Carter Administration were "fatally flawed. " In office, he decided not to request Senate confirmation of them (while promising not to violate them.) He declined to pursue ratification of two other previously negotiated agreements, the Threshold Test Ban Treaty and the Peaceful Nuclear Explosions Treaty. A view that seemed to be widely held within the Reagan Administration was that previous arms control agreements had resulted in substantial net advantages to the Soviet Union, and that only a determined U.S. program of "strategic modernization" would persuade the Soviets to agree to equitable limitations.

Although discussions were begun with the Soviets on strategic and intermediate-range nuclear force limitations, no progress was made. Some argued that the Soviets actually had no wish to reach an equitable agreement, but wished only to score propaganda points against the United States, to divide the NATO alliance, and to prevent deployment of Pershing II and ground-launched cruise missiles in Western Europe. Others argued that while Soviet bargaining intentions and tactics were certainly open to question, the Reagan Administration, manned in key positions by people hostile to arms control, did not negotiate seriously.[38]

With the debatable, or at least ambiguous, success of previous arms control arrangements and the lack of apparent progress toward new limitations, there has been a growing public concern about the eventual outcome of the strategic arms race and a general desire for nuclear arms reduction agreements.[39]

By the time of President Reagan's speech of March 23, 1983, several conditions held:

- the competition in strategic offensive nuclear weapons continued;
- there was considerable skepticism in the Administration and in Congress that arms control could do much to contain the Soviet military threat to the United States;
- the near-term potential for mutually beneficial negotiations with the Soviets seemed slim;
- there was deep suspicion toward the Soviet Union inside the Administration and widely shared by the U.S. public;
- advocates of ballistic missile defense for the United States were arguing that new technologies had put effective defenses within sight;
- the Department of Defense was concerned about Soviet BMD developments; and
- there was strong public feeling that something should be done to curb the nuclear arms race.

[38] "Cf. Strobe Talbot, *Deadly Gambits:* The Reagan Administration and the Stalemate in "Nuclear Arms Control (New* York: Knopf, 1984),

[39] 'See Jamie Kalven, "A Talk With Louis Harris," *The Bulletin of the Atomic Scientists,* August/September 1982, pp. 3-5. See also, Daniel Yankelovich and John Doble, "The Public Mood," *Foreign Affairs,* fall 1984, pp. 33-46.

WHAT IS NEW?

If President Reagan meant to set a bold precedent with his March 23d speech, he succeeded. The Strategic Defense Initiative Program is probably the first major national weapons research program which was begun with a public Presidential appeal for a national

commitment. The Initiative has made BMD once again a central issue of national debate over defense policy. But there are striking technical and political differences between the new debate and the old one.

In the late 1960s, the Nixon Administration policy was (until the ABM Treaty was negotiated) to propose immediate deployment of fully developed, currently available systems. The costs and capabilities of these systems were understood reasonably well. The likely countermeasures (multiple reentry vehicles and other penetration aids) had also been invented and, by the time of the signing of the ABM Treaty, tested in the United States. There was wide (though certainly not complete) agreement that when the Soviets adopted these countermeasures the proposed U.S. BMD system would be substantially reduced in effectiveness.

Today, while there are those who advocate early BMD deployment using near-term technology, the SD I focus is on BMD systems which are still only conceptual, based on technologies that are yet to be developed or matured. Similarly, the likely countermeasures are mostly conceptual, and their effectiveness and cost remain speculative.

Some experts consider these technologies to be promising, not only for "enhancing deterrence, " but perhaps ultimately for protecting most U.S. cities and population from the threat of nuclear destruction. Most experts agree that at least some research should be done on them. Although some argue for early deployment of BMD based on currently available technology, the debate now centers mainly on what kind of research to pursue, at what funding level, and for what ends.

Nevertheless, the SDI cannot be adequately characterized as "just a research program to find out what is possible. " The President has called for a national commitment of scientific and technological resources to find effective defenses against ballistic missiles. The proposed research program envisages a steadily rising level of expenditures and a series of "experiments" to demonstrate capabilities that could lead to engineering development decisions in the early 1990s and deployment decisions in the late 1990s. Just where the lines are between research on the one hand and development on the other is not entirely clear: if the research is highly successful, there will be pressures for moving to the early stages of development. Then, if early development is highly successful, there will be pressures for deployment. And whether or not decisions to deploy BMD systems are ever made, a U.S. research program may affect Soviet weapons decisions and U.S.-Soviet political relations.

The political environment today differs from what it was when the United States decided to exclude ballistic missile defense from its strategic posture. Although the country was still in a bitter war with a Soviet ally (the Democratic Republic of Vietnam) in 1972, the Nixon Administration had embarked on a policy of detente with the Soviet Union, acting on the assumption that a judicious mixture of competition and conflict was possible. Arms control was seen as a possible tool both for reducing the risk of fatal conflict between the two sides and for establishing political bonds which might ameliorate the causes of conflict. Detente, seen by many as a failed policy, has been discarded by the United States and arms control has come under increasing suspicion and criticism. At the same time, public fears of the consequences of unrestrained arms competition have grown. Although in 1985 the United States and the Soviet Union embarked on a new series of arms control talks, no one expected early progress.

Another significant difference between the BMD debate before 1972 and the one now is that then the ABM Treaty did not exist, and today it does. In the late 1960s, the United States entered into negotiations with the Soviets intending to persuade them that forgoing BMD would be mutually advantageous; in 1985, the announced U.S. intent is to persuade them that having BMD would be mutually advantageous. Although the Secretary of Defense and other Administration officials have expressed dissatisfaction with the treaty, the Administration has not yet chosen to seek

revision of it, let alone abandon it. It has stated that SDI research will be conducted within treaty constraints. The ABM Treaty is widely seen in the United States, among the NATO allies,[40] and perhaps in the Soviet Union, as the most significant arms control agreement between the superpowers. Its abrogation by either side would symbolize to many abandonment of the serious pursuit of arms control and resignation to a largely unconstrained nuclear arms race.

An important consideration in pursuing BMD, even at the research and development level, is when and how the ABM Treaty-would have to be modified or abrogated and what the consequences of such changes would be for U.S. national, NATO alliance, and U.S.-Soviet politics. On the other hand, those who see mainly disadvantages to the treaty believe that any risks in its abrogation or attempted modification are far outweighed by the risks (e.g., as militarily significant Soviet violations) of continued U.S. adherence to it.

Protagonists in the U.S. debate over BMD disagree about how central the ABM Treaty should be in the debate. But most can probably agree that the question of the survival of that particular treaty is subsidiary to the primary issue of whether BMD deployed by the United States and the Soviet Union would lead to a safer world.

[40]See David Yost, "Ballistic Missile Defense and the Atlantic Alliance," *International Security,* vol. 7, No. 2, fall 1982, pp. 143-174.