

Chapter 9

Alternative Future Scenarios

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Alternative Future Scenarios

INTRODUCTION

Thus far we have examined the possible applications of ballistic missile defense to various strategic purposes and the potential effects of BMD deployments on crisis stability, arms race stability, and arms control. We then examined the technologies that might be applied to ballistic missile defense. In this chapter we attempt to give the flavor of the current debate over BMD by presenting the positions of some major policy advocates. We pay particular attention to the idea of transition—of how and with what consequences we might move toward a world where BMD plays an important strategic role. We also look at ways that the world might evolve if the United States does not take the initiative in deploying BMD. For each picture of the future, we identify what appear to be the major assumptions upon which that picture rests. What are the key outcomes of U.S. action (or inaction) that each picture posits? What events are assumed to occur along the way to the predicted outcomes? We leave it to the reader to choose which assumptions seem most plausible.

The policy approaches reviewed here are the following:

1. The Strategic Defense Initiative approach, as defined by various Administration spokesmen;

2. An approach advocating the earliest possible deployment of space-based and ground-based BMD, as described in the writings of representatives of the “High Frontier” organization and others;
3. An “intermediate deployment” approach advocating deployment of BMD by the mid-1990s, using technology not yet available;
4. A “missile-silo-mainly” approach, advocating defenses with the limited objective of defending the U.S. land-based retaliatory force, with other targets defended only collaterally;
5. An approach aimed at strengthening the current regime banning most ballistic missile defense through current, and possibly additional, arms control measures.

After describing in this chapter the differing views of various policy advocates on longer-term objectives for BMD deployment, we will turn in chapter 10 to the immediate problem facing Congress: how to orient the U.S. BMD research program this year and in the years to come. These current decisions will be influenced by views on longer-term objectives.

ALTERNATIVE FUTURE SCENARIOS

The SDI Policy Approach

The goals of the Strategic Defense Initiative have been explained extensively in a pamphlet, *The President Strategic Defense Initiative*, issued January 3, 1985, by the White House; in an April 1985 *Report to the Congress on the Strategic Defense Initiative*; and in articles and speeches by George A. Keyworth, II,

Science Adviser to the President, Paul H. Nitze, Special Adviser to the President, Lt. General James A. Abrahamson, Director of the Strategic Defense Initiative Organization, and other Administration officials.¹

¹Relevant excerpts from these sources are presented in app. H. A list of statements and articles on BMD by Administration spokesmen appears in app. I.

According to these Administration spokesmen, progressive BMD deployment would be accompanied by mutual U.S.-Soviet reductions in offensive weapons. This would lead first to enhanced deterrence, and ultimately to basing national security primarily on defense. The effectiveness of the defenses would be enhanced by the reductions in offenses. Administration statements postulate the United States moving to a future defensive strategy in four phases, along the following lines:

1. Research Phase

As described by Reagan Administration officials, the SDI approach begins by launching "a broad-based, centrally managed research effort to identify and develop the key technologies necessary for an effective strategic defense. This phase, which has already begun, is expected to include a progressive series of BMD subsystem demonstrations of evolving technical capabilities. Each of these demonstrations would display a technological advance which would be militarily meaningful but which would not violate any arms control treaty provisions.

In view of the undiminished U.S. commitment to the security of its allies, the SDI research program will not confine itself to exploring BMD technologies with potential against ICBMs and SLBMs; it will also carefully examine technologies with potential against shorter-range ballistic missiles, such as those currently targeted against Western Europe. U.S. allies have been invited to participate in the SDI research program.

Principal emphasis will be placed on technologies involving nonnuclear kill concepts. Research on nuclear directed-energy weapons will also be undertaken in order to develop an understanding of the potential of this technology and as a hedge against Soviet work in this area.²

This research phase might last until some time in the 1990s, when the President and Con-

²*Report to the Congress on the Strategic Defense Initiative*, Department of Defense, April 1985, p. 3.

gress could assess the results of the BMD research program, and then decide whether to begin full-scale engineering development of a complete BMD system. The criteria for such a decision would, of course, be determined by the President and Congress at the time the decision is made. As presently envisaged by Administration spokesmen,³ however, this decision would not be made unless there were high confidence that the proposed system would be:

- effective in substantially reducing the counterforce capability of current and projected Soviet intercontinental, sea-launched, and theater nuclear forces;
- sufficiently survivable itself against preemptive attack;
- cost-effective on the margin; i.e. able to counter an increment in offensive countermeasures at a cost substantially less than the cost of the offensive increment; and
- able to contribute to improving the stability of the overall strategic balance at each stage of deployment.

Meanwhile, the mutual understanding that both sides were seriously pursuing strategic defense systems would force Soviet planners to rule out an effective first strike as a realistic future option, and would provide U.S. and Soviet arms control negotiators with a common limited strategic objective, retaliation, by which to discuss possible build-down of offensive nuclear arsenals.

2. Systems Development Phase

If a decision were made to go ahead, prototypes of all the required BMD components would be designed, built, and tested during the systems development phase. Meanwhile, the United States would seek Soviet agreement to phased deployment of defensive capabilities by both sides. Arms control proposals might include mutually agreed schedules for intro-

³See The President Strategic *Defense Initiative* published in January 1985 by the White House, Ambassador Paul H. Nitze's speech of Feb. 20, 1985, and Ambassador Edward L. Rowny, "America's Objective in Geneva," *New York Times*, Apr. 29, 1985.

ducing the defensive systems on both sides, associated schedules for reductions in offensive ballistic missiles and other nuclear forces, confidence-building measures, and agreed constraints on devices designed specifically to attack or degrade the other side's defensive systems. The Soviet leaders should respond cooperatively to these proposals. If they did not, the United States would have to decide whether to proceed to the next phase anyway.

On this issue, Fred C. Ikle, Under Secretary of Defense for Policy, has written:

The more the offensive armaments can be reduced by agreement, the easier and cheaper the job of providing effective defenses. Yet, to be realistic about Soviet motivations, we must seek to develop and deploy systems that can provide effective defenses even without such reductions. The United States is now pursuing new technologies that hold promise for success on the "hard road" as well. Thus, we make it all the more probable that the Soviet leaders will join us some day on the easy road of cooperation.⁴

3. Transition Phase

During this period, operational BMD systems would be deployed by the United States and the Soviet Union on an incremental, sequential basis, going up the scale of increasing capability levels suggested in chapter 5. Each added BMD system increment, in conjunction with effective and survivable offensive systems, would enhance deterrence by making each side's land-based nuclear forces more survivable, thus reducing the incentives for a preemptive first strike. The United States could also deploy BMD and air defenses to defend preferentially a limited set of either conventional military systems or populations, in the United States or overseas. At the same time, as the United States and the Soviet Union deployed BMD systems that progressively reduced the value of ballistic missiles, it is hoped that deep reductions in

the numbers of ballistic missiles on each side could be negotiated and implemented.⁵

While hardened military assets could be successfully defended by these transitional BMD systems, cities would still be hostage to mutual deterrence. This fact would be crucial to stability during the transition years. But if ICBM silos were defended, the retaliatory arsenals needed for attacking cities would not have to be nearly as large as those needed to launch or survive a preemptive strike. Moreover, during this period BMD deployments might save lives and limit damage in the unlikely event—planned or accidental—that a small number of nuclear missiles were launched despite effective defenses.

During the transition period, conventional military forces might have to be improved and expanded, especially in Europe. Our defense posture would move toward much heavier reliance upon conventional, nonnuclear forces, and correspondingly less reliance on using our nuclear forces to deter conventional attacks on ourselves and our allies. This strengthened role for conventional forces would need to be supported by restoration of technological leverage. At the same time, second- and third-generation BMD technologies would begin to become available, which could in time reduce the effectiveness of strategic nuclear weapons to the point that cities could become viable candidates for defense if offensive nuclear forces were limited to low enough levels.

Most explanations of the SDI policy approach by Administration officials tend to emphasize a scenario in which the Soviet *Union* agrees to deep reductions in all kinds of offensive nuclear forces. In this view, a fully effective nationwide defense of the United States and its Allies could not be achieved without deep reductions in Soviet offensive forces.⁶ So-

⁴According to Ambassador Paul Nitze, "We would see the transition period as a cooperative endeavor with the Soviets. Arms control would play a critical role. We would, for example, envisage continued reductions in offensive *nuclear arms*. (Speech in Philadelphia, Feb. 20, 1985.)

⁵See statement by SD I Director, Lt. General James A. Abrahamson, *Science*, Aug. 10, 1984, p. 601.

⁶"Nuclear Strategy: Can There Be a Happy Ending?" *Foreign Affairs*, spring 1985, p. 825.

viet unwillingness to accept such reductions would therefore preclude a successful transition to the final phase described below.

Administration officials argue, however, that in that case the United States should still deploy cost-effective BMD systems (if they can be developed) to enhance the deterrent value of U.S. ICBMs and bombers. If the Soviets keep striving to overcome these U.S. BMD systems with offensive countermeasures and deployment of larger offensive forces, the United States should try to develop and deploy more capable BMD systems. If the Soviets also build up full-scale BMD systems of their own to intercept U.S. missiles, the United States should build offensive forces capable of overcoming the Soviet BMD systems. In both cases, the United States would hope that its superior technological talents and industrial resources would permit it to stay ahead.

4. Final Phase

During this period, both countries would complete deployments of highly effective, layered BMD systems to protect their own and their allies' populations, as well as their military assets. Ballistic missile force levels would "reach their negotiated nadir." If similarly effective defenses had been developed by this time against cruise missiles, bombers, and other means of nuclear attack, such defenses could also be incorporated.

Ballistic missile and air defenses that might look less than 100 percent effective in the context of an offensive exchange involving tens of thousands of warheads could be expected to perform better against an attack by only tens or hundreds of warheads. Strategic defense could therefore make possible a world effectively disarmed of nuclear weapons, yet still retaining national sovereignty and security. Thus, by the end of the final phase the United States would achieve President Reagan's ultimate goal of "eliminating the threat posed by strategic nuclear missiles." Our present reliance on offensive retaliatory forces to deter a nuclear attack would be replaced by reliance on a combination of defensive weapons and of

deep mutual reductions in offensive nuclear forces.

Critical Assumptions for the SDI Policy Approach

The SDI policy approach appears to be based on the following assumptions:

Assumption 1.—There is a reasonable prospect of BMD technological developments meeting the Administration criteria of effectiveness, cost-effectiveness at the margin, and survivability.

Effectiveness.—It is assumed that the BMD systems will be effective and that possible Soviet responses to prospective U.S. BMD systems will not negate the effectiveness of those systems. The technical requirements for such effectiveness are discussed in detail in chapters 7 and 8.

Cost-effectiveness at the margin.—Increments of Soviet offense are assumed to be clearly more costly than corresponding increments of U.S. defense. Increments of U.S. offense will presumably also be more costly than corresponding increments of Soviet defense. (But if the latter were not the case, then Administration policy would be all the more likely to succeed, because continuing an offensive competition would be even more disadvantageous to the Soviets.)

If this assumption held, the Soviets would have a strong incentive to negotiate the mutual reduction of offensive forces. (As noted in chapter 6, though, the incentive may still not be sufficient.) Otherwise, in the transition phase the Soviets might well continue to attempt to counter U.S. defenses with offenses instead of seeing futility in further offensive additions.⁷ However, this criterion may be very difficult to apply in practice. First, costs may not be understood that well at the time that a decision is to be made. Secondly, the answer may vary greatly depending on the re-

⁷Indeed, the full Administration scenario would seem to imply that the Soviets, too, must find a defensive system with a favorable cost-exchange ratio vis-a-vis U.S. offenses; otherwise, the United States would find itself tempted to pursue strategic superiority by adding offenses as well as defenses.

quirements placed upon the system, and the level of confidence with which those requirements must be satisfied.

on the other hand, if both sides decided that a transition to defense dominance was desirable, they could agree to reduce offenses despite unfavorable cost-exchange ratios between offense and defense.

Survivability.— See chapter 6 for a discussion of the importance of BMD system survivability to maintaining crisis stability. Administration officials have emphasized that meeting this criterion would be particularly critical to a decision to deploy BMD.

Assumption 2.—The strategic program as a whole will be affordable for the United States.

It should be noted that there is also an assumption that defenses will be affordable *up to* the margin of trade-off between the offense and the defense: i.e. that the initial investment in defense necessary to achieve the desired effectiveness against the predicted responsive Soviet offensive threat will be acceptable to the United States. Since the Soviets already have an offensive force, their initial investment in offense has been made. The total U.S. investment in defenses to counter that threat has to be considered, as well as subsequent increments of defensive improvement to counter increases in the threat.

Moreover, the costs of the transition stage—in which defensive systems are being purchased, offensive systems are being maintained and improved, and conventional forces may be needing augmentation—must also be considered. It should be noted that particularly in the early stages, even before any U.S. BMD deployments have taken place, Soviet anticipatory offensive responses are highly likely. These could, in turn, appear to require counter-balancing U.S. offensive deployments.

Another issue is whether we and our allies could afford the additional conventional forces that would probably be needed to preserve the military balance in Europe when Soviet BMD deployment diminished the credibility of nuclear deterrence of conventional aggression.

Assumption 3.—The current ABM Treaty regime can be sustained until the United States is prepared to make a BMD deployment decision.

The SDI approach appears to assume that the necessary research and testing for a U.S. deployment decision can be conducted within what both sides agree are the confines of the ABM Treaty (or that the Soviets will agree to necessary amendments). Otherwise, if the Soviets came to believe that the United States was violating the Treaty, they might not postpone their own BMD deployment decision until the United States was ready to make one. The SDI approach also appears to assume that even if no treaty violations (or amendments) are necessary to the U.S. decision, the Soviets will be willing to wait for a U.S. decision and then negotiate the transition to defenses on both sides, rather than move ahead unilaterally with their own deployment because they believe the United States will do so soon.

Judging from published U.S. Department of Defense descriptions of the current Soviet BMD program, the Soviets are now in a position to field a large-scale, ground-based system of BMD interceptors sooner than the United States could (although such a system could almost certainly be overcome by existing U.S. offensive forces). Should the Soviets begin such a deployment, however, the United States might nevertheless feel compelled to respond with hasty offensive “fixes” and investment in U.S. BMD systems with only short-term value.

Such a Soviet move could be particularly undesirable if U.S. research should show that technology will not in fact permit defenses as effective as those now hoped for. We could find ourselves in a costly offensive-defensive arms race with little hope for decisive dominance of the defense—the situation the ABM Treaty was intended to preclude.

This assumption about the short-term viability of the ABM Treaty is not necessarily essential for the long-term SDI scenario, but if it were to prove incorrect, the transition to defenses could be more difficult and pose greater risks of instability.

Assumption 4.—Arms control agreements can be formulated and negotiated that will permit graduated, mutual, deep offensive reductions and defensive deployments that are crisis-stabilizing and arms-race-stabilizing.

This assumption has three components: a U.S. desire for such agreements, a corresponding Soviet desire, and the ability of both sides to overcome the technical difficulties in reaching such agreements.

Many analysts believe that if the Soviets should conclude that the United States is likely to abandon the ABM Treaty and deploy a nationwide BMD system, they would be highly unlikely to agree to offensive force reductions.⁹ Offensive arms control may therefore be difficult during this stage, because the Soviets would almost surely start to increase their offensive nuclear forces in order to counter the U.S. BMD system and maintain their offensive force capability. This appears to be a major problem confronting the U.S. negotiators in Geneva.

The SD I scenario assumes that technological developments will eventually persuade the Soviets of the futility of trying to maintain the military effectiveness of ICBMs. If this assumption proves incorrect, the demands placed on the BMD technology for effectiveness, cost-effectiveness, and survivability could be much higher. The ultimate goal of negotiated offensive reductions might come later rather than sooner, if at all.

Even with a mutual desire to negotiate a stabilizing transition to defensive deployments, the difficulties in working out such an agreement should not be underestimated. Experience with past U.S.-Soviet arms control

negotiations has demonstrated that asymmetries in offensive force structures and in strategic doctrines, Soviet secrecy, and other factors have made the process of reaching agreement highly arduous. Agreement on a transition involving a fundamental change in strategic goals and drastic changes in force structures, and adequate verification thereof, would be much more complex.⁹ For these reasons it might prove to be far more difficult to reach U.S.-Soviet agreement on increasing defensive and decreasing offensive deployment levels than it would be to agree to reduce offensive levels with BMD essentially banned.

Assumption 5.—The loss of the “extended deterrent” threat of U.S. offensive forces could be compensated for by either conventional force improvements or diplomatic measures to reduce the Soviet threat to U.S. allies.

For those early stages of BMD deployment intended to enhance deterrence by increasing the survivability of U.S. nuclear retaliatory capabilities, this assumption would not come into play. But as long-range offensive nuclear weapons became less effective on both sides, the possibility of escalation of theater conflicts to nuclear war would serve as less of a deterrent to Soviet aggression. The United States would presumably seek alternate means of reducing the Soviet conventional and theater-nuclear threats to U.S. allies and interests.

Assumption 6.—Political fallout from any U. S.-Soviet disputes over the SDI will be manageable.

Already, the Soviets have stepped up their allegations of America’s aggressive intentions to develop a first-strike capability, to undermine strategic stability, and to increase the danger of nuclear war. They have accused the United States of planning to abrogate the ABM Treaty and thus destroy any hopes for progress in strategic arms control.

Whether Soviet efforts to lay the blame on the United States for derailing arms control efforts will gain widespread credence, particularly in Western Europe, remains to be seen.

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The requisite elements of such a negotiated transition are discussed in ch. 6.

⁹For example, the Hoffman Panel of experts, appointed by the Department of Defense to assist in planning the SDI program, concluded that the Soviets would be likely to respond to U.S. BMD deployment “with a continuing build-up in their long-range offensive forces.” (Fred S. Hoffman, et al., *Ballistic Missile Defenses and U.S. National Security*, unclassified summary report, October 1983, p. 11.) Participants in the OTA Workshop on Soviet military doctrine and policy also judged that the first Soviet responses to U.S. BMD deployments would be to try to maintain the effectiveness of their offenses. For Soviet statements on this point, see app. K. References to studies of Soviet strategic policy are listed in app. M.

If they succeed, neutralism might become a stronger political movement in many NATO countries, and might well become government policy in several.

The SDI scenario assumes that there will not be unacceptable damage to the North Atlantic Alliance from neutralist tendencies or from European beliefs that a defensive system capable of really protecting Western European cities from nuclear attack is less attainable technically, financially, and politically than one for the United States. It also assumes that the British and the French would not be excessively alarmed by the prospect that loss of the ABM Treaty and subsequent Soviet BMD deployment would undermine their own nuclear deterrents.

Opposition from U.S. allies would not necessarily preclude deployment, but the Administration has stated that consultation with our allies would play an important part in a deployment decision.

Early BMD Deployment Policy Approach

Proponents of this approach propose that the United States begin immediately to deploy ballistic missile defenses as rapidly as possible, using presently available U.S. technology." Their goals are to enhance the current basis of deterrence by using defense to complicate Soviet targeting and to provide some measure of protection to U.S. society should deterrence fail. Complicating Soviet targeting would enhance deterrence by increasing the uncertainties in the minds of Soviet planners regarding the outcome of planned strikes

"Examples of this approach are described in Daniel O. Graham, *High Frontier: A New National Strategy* (Washington, DC: High Frontier, Inc., 1982); Daniel O. Graham, *High Frontier: A Strategy for National Survival* (New York: Tom Doherty Associates, 1983); Daniel O. Graham and Gregory A. Fosoldal, *A Defense That Defends* (Old Greenwich, CT: Devin-Adair, 1983); and Angelo Codevilla, "Understanding Ballistic Missile Defense," *Journal of Contemporary Studies*, winter 1984, pp. 19-35. This last article differs from the others in recommending early deployment of space-based chemical lasers, as opposed to the space-based kinetic kill vehicle constellation of *High Frontier." Most of the following discussion refers to the "High Frontier" proposals.

against the U. S., especially of strikes designed to achieve decisive military advantage. Their program highlights space-based BMD as a "technological end-run" around Soviet military capabilities, largely by utilizing superior U.S. computer miniaturization technology.

In order to create such a space-based BMD system quickly, the "High Frontier" organization recommends use of "essentially off-the-shelf" technology, and describes an illustrative system which would be designed to intercept Soviet ICBMs, SLBMs, MRBMs, and IRBMs in their boost and post-boost stages. Its 1982 report estimated such a BMD system to be deployable within 5 or 6 years at a cost of about \$13 billion.¹¹

That first-generation BMD system would be followed about five years later by a second-generation system, perhaps using laser or particle beams to attack missile warheads in their midcourse stage as well as earlier.

The advocates of the High Frontier approach emphasize, however, that these space-based BMD systems should be reinforced with a series of "collateral actions" as follows:

- point defense of U.S. ICBM silos, using a ground-based system such as the Low Altitude Defense System (LoADS) interceptors with nuclear warheads or the SWARMJET nonnuclear, high-velocity interceptor rockets, either of which they believe could be deployed within 2 years.
- a greatly enhanced civil defense program, which they believe could save a great number of lives and "protect enough essentials of our agricultural and industrial assets to give reasonable hope for the recovery of national power and our modern standard of living."
- mobile, high-performance, manned military "spaceplanes" to inspect and maintain U.S. satellites and, eventually, conduct "an active defense of U.S. installations in space."

△

"Department of Defense officials disagree with these estimates; see app. G.

- a manned space station for testing BMD system elements, first in low orbit and later in geosynchronous orbit.
- comprehensive anti-bomber defenses,
- increased anti-submarine warfare deployments,
- substantial strengthening of U.S. offensive strategic forces, including bombers, ballistic missiles, and cruise missiles, because the need for offensive retaliatory forces would remain.

While this policy approach has some similarities to the Reagan Administration's SDI approach, it differs in several important respects. First, it is based on the belief that a BMD system using current technology would be sufficiently effective to justify its deployment at this time. Second, it does not hold out an ultimate goal of near-perfect defense of cities, but explicitly advocates deployment of only partially effective defenses on the ground that these are better than none.¹² Third, the writings of its proponents do not suggest that it could lead to arms control agreements for deep reductions in offensive nuclear forces. On the contrary, they envisage a hostile Soviet response to U.S. adoption of this policy, resulting in an intensified arms race between the two superpowers, a race they believe the United States would win by making full use of its industrial and technological superiority:

If . . . we move strategic systems onto a fast-track, high-priority model the Soviets will have two or three years, not decades, to respond to our latest defense. And, as they begin to devise countermeasures and build the hardware to perform them, we will already be deploying the next round of strategic defenses—high energy lasers, particle beam weapons, and so on.¹³

In commenting on this prospect, Daniel O. Graham argues, "The tasks the U.S.S.R. will face if High Frontier becomes a reality require high technology on a prodigious scale. The So-

¹²In *A Defense That Defends*, op. cit., Graham and Fossedal state: "In fact there will never be a perfect defense, not against the bullet, against the tank, against nuclear weapons. What can be done is to complicate an attacker's calculations, blunt his forces, and save millions of lives" (p. 121).

¹³Graham and Fossedal, op. cit., p. 115.

viet economy, already severely strained, may well be unable to meet these requirements for high technology without disintegrating." He cites reports that indicate that Soviet "military expenditures are already approaching, if not exceeding, 'the objective limits' beyond which the U.S.S.R. cannot go without serious damage to the economy as a whole, including the reproductive [sic] base crucial to the very existence of Soviet military might. "1⁵

Critical Assumptions for the Early Deployment Policy Approach

This policy approach appears to be based on the following assumptions:

Assumption 1.—U.S. technology is now adequate to support prompt deployment of a functional, survivable, space-based BMD system.

In the view of some Defense Department officials, the High Frontier estimates for costs and construction times for such a system are unrealistic.¹⁶ Lt. General James A. Abrahamson, Director of the SDI Organization, has testified before the House Armed Services Committee that while many of the components that the High Frontier proposal might utilize were available, their integration into an effective and survivable weapons system would require much more study.¹⁷ Administration officials say, in short, that several years of research are needed to assess the validity of the assumptions critical to the early deployment approach.

¹⁵"High Frontier" (1982), op. cit., p. 86.

¹⁶Ibid., p. 162.

¹⁷The 1982 High Frontier report (op. cit., p. 71) estimates a total cost of about \$20 billion over 5 years and about \$35 billion through 1990. Department of Defense studies estimated that a comparable deployment would cost from \$50 to \$75 billion or more, according to testimony on the DOD authorization before the Senate Armed Services Committee on Mar. 23, 1983 (p. 2668). The DOD witness, John L. Gardner, indicated reservations about the survivability of such a system, and stated:

Before we would recommend a significant undertaking on a system like the High Frontier we believe that significantly more work would have to be done in the examination of that system from the viewpoint of its survivability and considering the kinds of responsive threats that might come at that system from the Soviet Union, were they to conclude that it represented a military threat.

See also app. G.

¹⁸Testimony of Feb. 21, 1985. See app. G.

A Background Paper done for OTA contains an analysis of the "High Frontier" proposal for 432 satellites carrying 1-km/see interceptors. It demonstrates that the concept would have meager coverage of Soviet ICBM fields.¹⁸

Assumption 2.—The cost of such a deployment could be relatively low.

This assumption is based partly on the idea that Congress and the Administration would be willing to allow the program to proceed on a 'fast track' without existing procedures for competitive bidding and administrative review, and that these procedures waste large sums of money. While such an approach might speed progress in some areas, views differ as to whether the costs would be reduced significantly.

Assumption 3.—Crisis instability will be avoided because technically superior U.S. defenses will reduce Soviet incentives to execute a preemptive attack under any plausible circumstances.

See chapter 6 for a discussion of crisis stability issues. Full success of the early deployment scenario seems to require U.S. strategic superiority from the beginning; otherwise, the United States could beat a dangerous strategic disadvantage for a considerable period. Partial success, however, might depend only on the increase in uncertainty posed by BMD to Soviet military planners.

Assumption 4.—Arms race instability will be manageable because the Soviets will not be able to afford to match U.S. technical superiority.

The long-run affordability of this policy approach seems to depend on its unaffordability for the Soviets. But if the Soviet economy cannot be forced into collapse, this approach requires that the United States be able to maintain an indefinite lead in the defense-offense competition.

Assumption 5.—The loss of the "extended deterrent" threat of U.S. offensive forces in the face of Soviet BMD could be compensated for by the

increased credibility of U.S. willingness to use conventional force.

According to the High Frontier literature,

There would be a realization that the U.S. was beginning to break out of the paralytic bonds imposed by the concept of Mutual Assured Destruction . . . there would be a restoration of the badly shaken European confidence in U.S. ability and resolve to actually use its power to preserve the Free World.¹⁹

Assumption 6.—Political fallout from any U. S.-Soviet disputes over the BMD plans and deployments will be manageable.

See the discussion of SDI assumptions above.

Intermediate BMD Deployment Policy Approach

The near-term strategic objectives of the Early BMD Deployment approach—enhancing the deterrence of a Soviet attack upon the United States by increasing Soviet uncertainty in their ability to accomplish military objectives in such an attack, along with providing some measure of protection to U.S. society should deterrence fail—are also sought by some who, unlike Early Deployment advocates, do not believe that existing BMD technology is adequate. Supporters of an "Intermediate BMD Deployment" approach believe that U. S. BMD deployment should not wait for the feasibility of long-term, highly effective BMD concepts to be demonstrated. However, they would not advocate that deployments start immediately. Instead, they would support U.S. deployment of BMD in the "intermediate-term" —say by the mid- 1990s— of the best system that could be deployed at that time.

Advocates of "early deployment" approaches hope to deploy BMD so rapidly that the Soviets will be unable to counter it before it becomes effective. "Intermediate deployment" supporters do not expect to avoid So-

¹⁸ Ashton B. Carter, *Directed Energy Missile Defense in Space*, OTA Background Paper, OTA-BP-ISC-26, April 1984, pp. 34-35.

¹⁹ Graham, *High Frontier: A New National Strategy*, op. cit., p. 88.

viet countermeasures, but believe that the added uncertainty that Soviet planners and weapons designers will face against even a partially effective U.S. defense will enhance deterrence. Except for their difference in timing, the rationales and underlying assumptions of the "early deployment" and "intermediate deployment" approaches are similar.

Critical Assumptions for the Intermediate BMD Deployment Policy Approach

The critical assumptions of the Intermediate Deployment Approach closely resemble those already discussed under the Early Deployment Approach. However, the first assumption in that approach must be modified slightly, and one more added.

Assumption 1.—In the "intermediate-term" (mid 1990s), U.S. technology will be adequate to support deployment of a functional, survivable BMD system.

Such a system might eventually include space-based components, but would probably start out with ground-based terminal and perhaps midcourse interceptors. Nonnuclear interceptors would probably be desirable, but if adequate performance and confidence could not be attained with nonnuclear technologies, nuclear interceptors would be required.

Assumption 2.—Deterrence of Soviet nuclear attack does not depend critically on the number of U.S. warheads that would penetrate Soviet defenses in retaliation.

Although an intermediate deployment of ballistic missile defenses by the United States would confuse Soviet attack plans and increase the uncertainties they would face in conducting a nuclear attack upon the United States, deployment of a Soviet defense in the same time frame, using systems evolved from the current upgrade of the Moscow system, would lessen the ability of the United States to conduct a retaliatory strike. In chapter 5, it was shown that even if the United States and Soviets deploy equivalent defenses, it is quite possible that in the event of a Soviet first strike, more U.S. retaliatory warheads would be intercepted by Soviet defenses than would

have been saved by U.S. defenses. In other words, fewer U.S. retaliatory warheads would reach the Soviet Union if both had such defenses than if neither did. Advocates of "intermediate-term" BMD deployment acknowledge this possibility, but believe that the uncertainties introduced into Soviet attack plans by U.S. defenses would more than compensate for whatever success Soviet defenses might have in intercepting our retaliatory strike.

Silo Defense Policy Approach

A third variant of a policy approach favoring U.S. BMD deployment differs from those described above in that it calls for defense primarily of ICBM silos. The major purpose of such a BMD system would be to enhance the survivability of the land-based leg of the U.S. deterrent triad. While in some configurations it might offer a low level of partial protection to some soft targets like cities, it would not be intended as just the first stage of a more ambitious defense. A defense primarily of missile silos would enhance the current basis of deterrence by increasing the U.S. forces expected to survive a Soviet first strike, raising the cost to the Soviets of attempting to destroy those forces, and possibly complicate Soviet targeting.

Proponents of this approach believe it would serve several strategic objectives:

- It would constitute a hedge against possible future vulnerabilities that might arise for the SLBM and strategic bomber forces.
- It would reduce the incentive to rely on a launch-on-warning strategy for U.S. ICBMs, thereby improving crisis stability.
- By adding to the uncertainties the Soviets would face when contemplating a possible preemptive strike, it might discourage such a strike.
- It would introduce a "firebreak" against limited nuclear attacks by the Soviets, requiring any effective Soviet attack to use thousands of weapons, thereby running a higher risk of heavy U.S. retaliation than would an attack of only a few.

These objectives are shared by SDI proponents for the early stages of BMD deployment. But proponents of limited BMD primarily for missile-site defense argue that their approach would lessen pressure on the Soviet Union to increase its offensive forces to maintain its assured retaliatory deterrent capability.

Proponents of the Silo Defense policy approach believe that advances in BMD technology have made the technical feasibility of effective hard-point silo defense more promising than it was in the early 1970s. They believe that significant progress has been made toward coping with problems which were particularly troublesome then, such as decoy discrimination and defense of acquisition and guidance radars.

This policy approach does not envision a transition to a fundamentally different U.S. nuclear strategy. Rather, it proposes to deal with a problem in current strategy—the vulnerability of part of the retaliatory force to preemptive attack by Soviet ICBMs. Nevertheless, it would probably require a carefully managed arrangement with the Soviets to achieve its goals without introducing undesired instabilities into the strategic relationship.

Some advocates of silo defense see it as leading to a defense-oriented world, and argue for a “defense protected build-down” (DPB), saying that:

An orderly transition to a defense-oriented world . . . can be achieved by combining deployment of defensive weapons with a concomitant and compensating reduction of offensive weapons.²⁰

They argue that a world free of the threat of nuclear destruction is an illusion, but that the level of destruction of which retaliatory weapons are capable might be reduced.

“Alvin M. Weinberg and Jack N. Barkenbus, “Stabilizing Star Wars,” *Foreign Policy* (No. 54), spring 1984, p. 165. For an earlier argument that limited defenses could permit reduced offensive forces, see G. E., Barasch et al., “Ballistic Missile Defense: A Potential Arms-Control Initiative,” Los Alamos National Laboratory Paper LA-8632, UC-2, issued January 1981.

On the other hand, another advocate of limited BMD deployments has argued that the benefits of limited defense are sufficient in themselves and that BMD would not make deep reductions in offensive arms more likely:

Since there are no foreseeable circumstances in which either side will feel secure without maintaining an assured destruction capability, the ABM [deployment] would make it unlikely that either side would be interested in negotiating reductions to low levels.²¹

This analyst does believe, however, that the Soviets might agree to modify the ABM treaty to permit limited defenses.

Critical Assumptions for the Silo Defense Policy Approach

This policy approach appears to be based on the following assumptions:

Assumption 1.—BMD for missile silo defense can be effective in the face of increased offensive forces and countermeasures.

Effective BMD for silo defense would have the effect of raising the cost (in terms of attacking reentry vehicles) of destroying each missile silo, but would not make the task impossible if there were no constraints on offensive forces.²²

Assumption 2.—BMD is the most cost-effective means available for protecting U.S. retaliatory capabilities.

If a system intended primarily to defend missile silos is not considered to form the core of a more ambitious defense, then the cost-effectiveness of the alternatives becomes a larger consideration. For example, mobile or other deceptive basing modes for ICBMs should be considered. Depending on the predicted size of the Soviet threat, such basing modes might be the first step to take, rather

“Jan Lodal, “Deterrence and Nuclear Strategy,” *Daedalus*, fall 1980, p. 170.

“Testimony of Richard D. DeLauer, Under Secretary of Defense for Research and Engineering, Hearing before the Research and Development Subcommittee of the House Committee on Armed Services, Nov. 10, 1983, H. A.S.C. 98-21, p. 20.

than BMD.²³ Since defended U.S. ICBMs would probably have to attack defended Soviet targets, the trade-offs in U.S. retaliatory effectiveness need to be considered carefully. Arms control negotiations to reduce the Soviet counterforce threat should also receive full consideration.

Assumption 3.—The Soviets would not respond to limited U.S. BMD deployments with a large-scale BMD system intended to defend urban-industrial targets as well as ICBM silos.

Such a Soviet response would place pressure on the United States to expand our defenses, offenses, or both, just to stay in the same relative strategic position. Some advocates of limited BMD argue that the Soviets would see that, given the likelihood of effective U.S. countermeasures, trying to build very effective defenses would be futile. But the defensive system the Soviets are best prepared to deploy might not be best suited to ICBM silo defense. Should the Soviets deploy a system which looks to the United States like the base for a larger defense of Soviet territory," the United States may decide to respond by building a larger offensive force. This in turn could stimulate larger Soviet offenses and defenses.

Others argue that the Soviets could be engaged in negotiations to define the kinds of defenses both sides could live with. The best way for the two sides to assure one another of the limited nature of their BMD deployments may be for them to agree to a modification of the ABM Treaty specifically to permit carefully defined silo defenses. This assumes that the Soviets, who have deployed a defense of Moscow but never utilized the ABM Treaty provision allowing them to defend silos, could be persuaded to seek a silo defense.

²³On various possible basing modes and the potential of preferential BMD for missile bases, see ch. 3 in U.S. Congress, Office of Technology Assessment, *MX Missile Basing*, OTA-ISC-140 (Washington, DC: U.S. Government Printing Office, September 1981).

²⁴In a typical "prudent worst-case" analysis, almost any large-scale Soviet BMD deployment would probably look like that.

Assumption 4.—Neither side will perceive the limited BMD system deployed by the other as the core of a more extensive damage-limiting defense.

A tacit or a negotiated agreement to build larger, but still limited, BMD systems maybe difficult to formulate. A highly-localized (site) defense by ground-based interceptors would appear to be the least ambiguous type of deployment, but might not be nearly as effective as a system with more than one layer of defense. One side or the other might not be willing to settle for a BMD with only a single terminal layer. But systems with more than one layer may appear to give one a "breakout" potential for a much more ambitious defense.

Assumption 5.—Neither side will respond to the other's limited BMD system with greatly augmented offenses.

Lt. General James A. Abrahamson, Director of the Strategic Defense Initiative Organization, has argued that a defect in setting only limited goals for a BMD system is that the Soviets are likely to devote considerable effort to countering it, whereas the promise of increasingly effective defenses would cause them to see the futility of trying to maintain offensive capabilities.²⁵

Augmented Soviet offenses could cause the United States to deploy additional defenses and offenses, which in turn could stimulate further Soviet deployments.

A Non-BMD Policy Approach

Most opponents of BMD believe that, at least for the foreseeable future, U.S. policy should be to strive to continue the current situation in which neither the United States nor the U.S.S.R. deploys BMD, and offensive arms development and deployment are limited by agreement.²⁶

²⁵See, for example, his testimony before the Subcommittee on Strategic and Theater Nuclear Forces, Committee on Armed Services, U.S. Senate, Feb. 21, 1985.

²⁶comprehensive descriptions of this viewpoint appear in Sidney D. Drell, Philip J. Farley, and David Holloway, *The Reagan Strategic Defense Initiative: A Technical, Political, and Arms Control Assessment* (Stanford, CA: Center for Interna-

In view of the factors which threaten the continued viability of the ABM Treaty,²⁷ most people who advocate preservation of the treaty believe that steps should be taken to strengthen it.” Their views are described in the following sections. Since there are many ideas on how this can best be done, the descriptions below include a range of proposals drawn from many sources. While this approach is generally consistent with the main strategic policy objectives of the Nixon, Ford, and Carter administrations, it also includes new measures to further those objectives in coming years.

Advocates of this policy approach agree with SDI advocates that we should not count on the threat of assured destruction to prevent a nuclear catastrophe forever. However, they do not believe that the solution to this problem can be found primarily in new military technology. Instead they believe that in the near term the best hope lies in early steps to improve strategic stability through arms control agreements, as described below. (Their views on ways to reduce the long-term risks inherent in threats of nuclear retaliation are discussed subsequently.)

Under this approach, the United States would make a set of related proposals to the Soviet Union which could include some or all of the following elements:

— tional Security and Arms Control, Stanford University, 1984); and Richard L. Garwin, Kurt Gottfried, and Henry W. Kendall, *The Fallacy of Star Wars* (New York: Random House, 1984). A list of articles by critics of the Strategic Defense Initiative, including former Secretaries of Defense Harold Brown, Clark Clifford, Robert McNamara, and James Schlesinger, appears in app. J.

“For a detailed discussion of these factors, see Thomas K. Longstreth, John E. Pike, and John B. Rhinelander, *The Impact of U.S. and Soviet Ballistic Missile Defense Programs on the ABM Treaty* (Washington, DC: National Campaign to Save the ABM Treaty, March 1985).

“For example, in a speech on Nov. 29, 1984, Senator Edward Kennedy said:

... developments in both [the United States and U. S. S. R.] already place the [ABM] Treaty in serious jeopardy. Of particular concern is the development of advanced air defenses that may have a ballistic missile capability. We are now hearing charges and countercharges of Treaty violations. The trends suggest that the superpowers are approaching a point where they must either take concrete measures to renew the Treaty, or risk its abrogation. Congress must act on its own to prevent the Administration from misusing Star Wars to provoke the Soviet Union into abrogating the ABM agreement. We should prohibit the funding of any weapons research or development which could violate that treaty.

- Preserving and strengthening the ABM Treaty:
 - by strong endorsements of its long-term importance by the senior officials of both countries;
 - by resolving compliance issues in the bilateral Standing Consultative Commission;
 - by exploring ways to clarify, modify or supplement the Treaty to eliminate troublesome ambiguities or loopholes indicated by events since the Treaty was signed and by new technological developments;²⁹
 - by keeping the U.S. and Soviet BMD research programs at a level and scope no greater than needed to hedge against one another’s BMD technology developments. This could include maintaining realistic deployment options and exploring new technologies within the bounds of the ABM Treaty .”
- Negotiating a verifiable agreement to ban testing and deployment of anti-satellite weapons and all space-based weapons. Such an agreement would also reinforce the ABM Treaty by eliminating a potential loophole: the testing of devices for potential BMD use under the guise of ASAT testing.
- Negotiating mutual, verifiable limitations on offensive nuclear forces, designed not only to reduce their numbers substantially, but also to decrease counterforce capabilities and strengthen survivability

“For a development of this approach, see Drell, Farley, and Holloway, op. cit. These authors conclude:

Cooperative action could counter the corrosive effects of unilateral ABM activities which will inevitably cause disputes arising out of deliberate or unintentional divergences in interpretation of the Treaty. More important, it could reinforce confidence that the two nations see the purposes and value of the ABM Treaty in consistent ways, and that each is determined to act separately and jointly toward the fundamental aim of avoiding nuclear war.

²⁹The nature of such a research program is discussed in Sidney D. Drell and Thomas H. Johnson (eds.), *Strategic Missile Defense: Necessities, Prospects, and Dangers in the Near Term*, report of a workshop at the Center for International Security and Arms Control (Stanford, CA: Stanford University, Apr. 1985). Also printed in U.S. Senate, Committee on Armed Services, *Hearings of the Subcommittee on Strategic and Theater Nuclear Forces*, Mar. 19, 1985,

of retaliatory forces on both sides.³¹ This proposal could include bans on all nuclear missile flight tests and on all nuclear weapon tests.³² It would also be logical to supplement it with limitations on air defense and on anti-submarine warfare.

Among the proponents of this general policy approach, there is a wide spectrum of views regarding the long-term prospects for avoiding nuclear war, either between the United States and the Soviet Union, or between other countries. Some believe that after (but only after) offensive forces have been reduced to a sufficiently low level, deployment of effective nationwide defenses against nuclear attack would help to enable all the countries involved to agree to do away with nuclear weapons altogether.³³ Others believe that for the foreseeable future the most promising way to prevent nuclear war is to maintain a small but invulnerable nuclear retaliatory force in the hands of at least the United States and U. S. S. R., and perhaps Britain, France and China as well.³⁴ Still others believe that only by improving political relationships between nations or by evolving strong translational institutions can we hope to banish the long-term threat of nuclear holocaust.³⁵

³¹This would be consistent with the conclusion of the Scowcroft Commission that "The central purpose of our arms control efforts should therefore be to enhance U.S. security by increasing strategic stability. (Second report of the President Commission on Strategic Forces, Mar. 21, 1984, p. 3.)

³²Proponents of this approach believe that a missile flight test ban would be particularly valuable in preventing the Soviet Union from increasing its destabilizing counterforce capabilities; e.g., by developing more accurate land-based ICBMs, highly accurate SLBMs that could destroy U.S. ICBM silos, or depressed-trajectory SLBMs that could reach U.S. bomber bases before the bombers could escape. See Les AuCoin, "Freeze," *Bulletin of the Atomic Scientists*, November 1984; and "Nailing Shut the 'Window of Vulnerability'," *Arms Control Today*, September 1984. Other arms control advocates propose allowing certain kinds of missile modernization in order to reduce vulnerabilities of both sides' offensive forces. See, for example, Harold Brown and Lynn E. Davis, "Nuclear Arms Control: Where Do We Stand?" *Foreign Affairs*, summer 1984.

³³For an elaboration of this concept, see Freeman Dyson, *Weapons and Hope* (New York: Harper & Row, 1984), pp. 73 ff. and 280 ff.

³⁴see, for example, Richard L. Garwin, "Reducing Dependence on Nuclear Weapons, in David C. Gompert, et al., *Nuclear Weapons and World Politics: Alternatives for the Future* (New York: McGraw-Hill, 1977).

³⁵See, for example, Burns H. Weston (ed.) *Toward Nuclear Disarmament and Global Security: A Search for Alternatives*

Critical Assumptions for the Non-BMD Policy Approach

This policy approach appears to be based on the following assumptions:

Assumption 1.—The risks of continuing a strategy of deterrence by assured retaliation, stabilized by arms control measures, are less than the risks of introducing BMD into the strategic arms competition.

Advocates of this approach maybe unhappy about the U.S. need to rely on assured retaliation to deter Soviet attack, but they do not see a plausible alternative. This assumption is based in part on an assessment that over the next two or three decades we can have higher confidence in our ability to maintain adequately survivable and effective retaliatory forces than in our ability to build BMD systems effective enough to provide "defense dominance. It is also based on the view that the Soviets are more likely to agree to maintaining and stabilizing the current strategic relationship than they are to agree to shifting to a defense-oriented strategic relationship. Most BMD advocates disagree with one or both of these views.

Assumption 2.—It is possible to arrive at, and maintain in force, mutually acceptable, adequately verifiable arms control agreements which will satisfy both sides that neither is deploying significant BMD systems or has a significant lead in BMD break-out capability.

Given the questioned record of Soviet compliance with existing arms control agreements, and given misgivings on each side about new technological developments on the other side, this may be a challenging condition to fulfill.

Some of the critics of arms control believe that it is dangerous to try to cooperate with the Soviet Union. They believe that the Soviets use arms control negotiations solely to attempt to weaken the West. They think any effort to seek mutually advantageous agree-

(Boulder, CO: Westview Press, 1984); Randall Forsberg, "Confining the Military to Defense as a Route to Disarmament," *World Policy Journal*, winter 1984; and Robert S. Woito, *To End War: A New Approach to International Conflict* (New York: Pilgrim Press, 1982).

ments between the superpowers is doomed to failure, because Soviet hostility to the United States will forever dominate any relationship between them. In this view, the Soviets might enter into additional arms control agreements with the United States mainly to limit U.S. progress on BMD while the Soviets prepare to abrogate the treaty, openly or clandestinely, in their own time.

Other observers have a more complex view of Soviet motivations, but nevertheless see significant problems in seeking new arms control agreements. Even given the political will on both sides, there are technical obstacles to effective agreement, especially in the case of space-based or space-attacking weapons. For example, the distinctions between anti-satellite weapons and sensors and potential BMD weapons and sensors is becoming more difficult to draw.

Assumption 3.—A U.S. research program which hedges against Soviet break-out from such arms control agreements will either deter such break-out or provide the United States with an appropriate offensive or defensive response to it.

Many advocates of the non-BMD policy approach assume that the Soviet Union has not already made a firm decision to break out or “creep out” of the ABM Treaty, and that such a U.S. research program could help to deter them from doing so. Some believe the United States could reduce this risk further by developing prototype BMD systems within the bounds of the ABM Treaty, as the Soviets have done, as well as by maintaining a strong capability to overcome potential Soviet BMD

systems with penetration aids, enhanced offenses, and other countermeasures.

On the other hand, BMD proponents argue that U.S. BMD research languished under the ABM Treaty regime until the Strategic Defense Initiative began. They contend that a lack of intent to deploy a system might remove incentives for adequate funding for BMD research. A Soviet break-out from an arms control regime limiting BMD could then leave the United States at some disadvantage, at least temporarily.

Assumption 4.—The Soviets can be persuaded to enter into and comply with offensive arms control limitations which would reduce the threat of preemptive nuclear attack, thereby reducing current U.S. incentives to deploy a defense of ICBM silos.

This assumption may not be critical to preserving the non-BMD regime, but offensive arms reductions would be useful, particularly in making continued BMD limitations acceptable in the United States. During the SALT I period and on into the SALT II period, the Soviets continued to add to and improve their ballistic-missile borne hard-target-kill capabilities. They have shown little interest in negotiating away those weapons which the United States finds most destabilizing. Some argue that the current U.S. interest in developing BMD may induce the Soviets to take a serious interest in offensive missile reductions if they believe BMD can be headed off in that way, but seeking such a trade-off does not appear to be current U.S. policy.