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THE CASE FOR DEPLOYING SDI IN THE 1990s

INTRODUCTION

Recent technological successes in the Strategic Defense Initiative (SDI) program mean that deployment options for strategic defense systems must now be seriously considered. Deployment of a comprehensive strategic defense system could begin in the early to mid-1990s. Once a decision is reached to deploy a strategic defense system, it will take from five to seven years to complete construction and deployment. Deployment will occur incrementally. The systems with the most mature technologies will be deployed first while those requiring further refinement and a longer lead time in development will come later. The end product should be an effective system capable of being modernized later.

An incremental approach is the norm for building and deploying military systems. Over the years, for instance, the U.S. ballistic missile force has been modernized so much that it would be unrecognizable to the military planners who in 1959 deployed the Atlas as the first U.S. intercontinental ballistic missile. Building and fully deploying military systems takes years.

Critics of SDI, however, seem to expect a full and perfect defense all at once. They insist that incremental deployment of strategic defense systems will be destabilizing because it will provoke the Soviets into adding more offensive forces to overwhelm the limited U.S. defense before the system is completed. And the critics argue further that beginning deployment in the early 1990s would be ineffective because early phased deployments would be outdated by the time that the system was finished.

The critics ignore important factors. Among them:

1) Even limited defenses deployed in phases would strengthen deterrence; they need not be 100 percent perfect to do so. No Soviet leader would launch a first strike against the U.S. knowing that strategic defenses could make a successful attack very unlikely.

2) Incremental deployment of strategic defenses beginning in the early 1990s would be stabilizing, not destabilizing. Any attempt by the Soviets to overwhelm a limited first-phase deployment with increased offensive forces would be futile because of the cost-effectiveness of defensive systems compared with offensive ones and the deterrent effect that defensive systems have against calculated Soviet first strikes.

3) Deployment using near-term technologies not only can be very effective immediately, it also can serve as a structural framework for additions of more exotic systems such as lasers. Early limited deployment could guard against accidental or limited Soviet launches. Moreover, a full-fledged system based on near-term ground-based interceptor rockets, space-based kinetic-kill vehicles, phased-array radars, and space-based and airborne sensors would not be outdated once deployment were completed because even the most futuristic plans would include these elements in the final structure.

4) Deployment could lead to real arms reduction agreements with the Soviets. The Kremlin will negotiate seriously to reduce offensive arms only when convinced that the U.S. is serious about deploying strategic defenses. Otherwise Moscow will wait until U.S. critics kill the SDI program. Moscow, meanwhile, will be proceeding quietly with its own strategic defense program. Once SDI deployment becomes inevitable, the Soviets should be more willing to negotiate the details of a transition toward an environment featuring greater reliance on strategic defense. And once strategic defenses reduce the first-strike utility of offensive nuclear forces, the Soviets should be more interested in decreasing them.

WHAT MAKES NEAR-TERM DEPLOYMENT OF SDI FEASIBLE

Four basic factors should guide the shape and pace of a phased near-term deployment of a U.S. strategic defense system: 1) the availability of technology; 2) the strategic, engineering, and architectural requirements that will determine the order in which hardware is deployed and the ultimate shape of the entire system once it is completed; 3) the principle that elements deployed in the first phase be part of the overall system; and, 4) the cost-effectiveness of any particular deployment strategy.

Because these four factors at times will produce contradictory demands, compromises will be needed. Example: It probably makes best strategic sense to deploy the space-based boost-phase defense first since this would give the defense system the greatest leverage against a Soviet ballistic missile attack. But the technology for ground-based systems, which intercept incoming warheads outside the atmosphere (called exoatmospheric interception), is most mature and thus most likely to be deployed first. In the interests of building the entire system as soon as possible and to ensure that it is structurally coherent, therefore, it would be best generally to let the availability of technology be the primary factor in setting the pace of deployment. Since the technology for space-based kinetic-kill vehicles for a boost-phase defense is only two years behind ground-based exoatmospheric interceptor systems, the deployed strategic defense system should not excessively favor either ground- or space-based elements.

The first phase of a deployed U.S. strategic defense system therefore most likely would consist of ground-based exoatmospheric interceptor rockets capable of destroying incoming warheads outside the atmosphere in a so-called mid-course space defense. Deployment of the Exoatmospheric Reentry Interceptor System (ERIS) could begin sometime between 1992 and 1994. According to a study by the George C. Marshall Institute, the mid-course layer could consist of 10,000 ground-based ERIS interceptors and a fleet of three to five airborne optical sensor planes for tracking incoming warheads.[1] The cost including the interceptors, sensor aircraft, and launch facilities is estimated at $32 billion over five years for the fully deployed system.[2]

Deployment of a High Endoatmospheric Interceptor System (HEDI) for knocking down inside the atmosphere the incoming warheads that have "leaked" through the other defense layers could begin roughly two years after the beginning of ERIS deployment. According to the Marshall Institute study, the terminal HEDI defense system could consist of about 3,000 ground-based interceptors with about 30 radars for tracking incoming warheads.[3] The full cost of the HEDI layer

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1. George C. Marshall Institute, Report of the Technical Panel on Missile Defense in the 1990s (Washington, D.C.: George C. Marshall Institute, 1987), p. 38. Some analysts estimate that only a few hundred ERIS interceptors would be required for a mid-course layer defense.

2. Ibid., p. 9.

3. Ibid., p. 10.

including the interceptor missiles, radars, and launch facilities would be $18 billion over five years.[4] Together with the ERIS layer for interception in space, the terminal HEDI system would provide initial limited protection of both U.S. population centers and U.S.-based strategic forces.

Also beginning some two years after work starts on ERIS would be a boost-phase system designed to destroy enemy missiles when they are most vulnerable--immediately after the rocket carrying them is boosted off the launch pad. This defense would consist of kinetic-kill vehicles and sensor satellites in space. Space-based kinetic-kill vehicles are small rockets placed on orbiting space platforms that destroy a target by smashing into it. Heat-seeking sensors track missiles by detecting the heat in the rocket plume. The Marshall Institute estimates that a boost-phase system capable of destroying 76 percent of launched Soviet warheads would consist of 11,000 space-based kinetic-kill vehicles (SBKKVs)--each satellite could carry 5 to 10 SBKKVs, which adds up to between 1,100 and 2,200 satellite weapon platforms, four stationary (geosynchronous) satellites to detect when enemy rockets are launched, and ten sensor satellites orbiting at altitudes between 500 and 1,500 miles from the earth to track enemy missiles once they are launched.[5] Estimates are that this second-phased deployment of boost-phase defenses would cost $68 billion over five years.[6]

It probably would take five to seven years to deploy fully both the ground- and space-based components of the strategic defense system. A three layered boost, mid-course, and terminal phase defense against ballistic missiles thus could be completed by the year 2000 or soon after. The battle management computer systems envisioned by advocates of deployment in the 1990s will be decentralized. As such, decisions on when to fire a space rocket will be made on individual satellite platforms and not by a centralized computer. Each defense layer therefore will be self-managing and thus effective on its own once it is deployed. There will be no need to wait until the entire system is completed before the U.S. begins enjoying the benefits of some protection from ballistic missile attack. Such a strategic

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4. Ibid.

5. Ibid., pp. 37-38, 40. Some analysts estimate that only 400-600 satellite platforms would be required for a boost-phase defense.

6. The Marshall Institute estimates that the total operation cost of the three-layered strategic defense system would be around $121 billion; Marshall Institute, op. cit., p. 10.

defense system, in fact, could be around 90 percent effective against a Soviet attack of around 10,000 warheads[7] even without the addition of laser interceptor systems.

When further technology advances permit the systems to be modernized, it probably will be to improve the capability to discriminate between decoys and real warheads in space. As directed energy technologies became available, they could be added to identify, track, and intercept missiles and warheads. The decision as to when and what kind of directed energy systems would be deployed would be determined by how effective they are and by whether they can achieve the same or greater capability at a lower cost than can kinetic-kill weapons, and to what extent they present problems to Soviet countermeasures. Laser weapons, for example, would add defensive capability to the system by being much more difficult to counter.

This approach would also satisfy the principle that elements deployed in the first phase be part of the overall strategic defense system. The kinetic-kill systems deployed in the 1990s will not be obsolete by the time the system is completed. They will be very effective in their own right, and can be modernized with more advanced directed energy systems as the technology becomes available.

NEAR-TERM PHASED DEPLOYMENT WILL BE STABILIZING

Critics of SDI charge that a near-term deployment lasting several years will be dangerous. They argue that the Soviets will either be tempted to attack U.S. defenses to prevent them from allowing Washington a first-strike capability, or that the Soviets will keep adding offensive nuclear forces and defensive countermeasures to ballistic missiles. In either case, they argue, the strategic environment will become more unstable, hence more dangerous. The Soviets supposedly will be prompted to attack the U.S. preemptively, or they will respond in ways that escalate the arms race.

Such fears are enormously exaggerated. It strains credulity to suggest that the Soviets would start World War III simply because a U.S. strategic defense system could stop many Soviet nuclear missiles from detonating on U.S. territory. Moscow will not start a nuclear war simply because SDI is protecting the U.S. against Moscow's growing first-strike capability. The fact is that Moscow will be less likely to attack the U.S. with SDI than without it. If there is a deployed strategic defense system in the U.S., the Soviet leadership will be less certain than ever before that its first strike against the U.S. will succeed.

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7. Marshall Institute, op. cit., p. 6.

Nor would a deployed near-term U.S. defensive system continually escalate the offensive arms race. The Soviet Union might add more offensive arms to counter a deployed U.S. strategic defense system in the early phases of deployment, but this most likely would be temporary. If strategic defenses continually reduce the military utility of offensive forces, as many experts believe, and if defenses over time become cheaper than offenses, as many experts believe, then Moscow will find that it makes more sense to invest its limited resources in defensive rather than offensive systems. If the Soviets want to deny the U.S. the capability of someday striking the Soviet homeland without suffering retaliation to their own territory, they will eventually have no choice but to concentrate more on defensive than offensive forces. The likely consequence of this new defense-minded strategic environment will not be an escalating offensive arms race but a shift of military competition toward perfecting strategic defense systems.

The result: deploying strategic defenses in the near term or the long term will be stabilizing. The reason: During every phase of deployment the deterrent value of U.S. defenses will likely neutralize any added offensive forces that the Soviets may deploy to overwhelm a U.S. strategic defense system. This is because the marginal gains made by adding offensive forces will be offset by the capability of defenses to deny the effective use of these offensive forces in a first strike.

Example: A study recently conducted by the George C. Marshall Institute concludes that for a Soviet attack to have 90 percent probability of success against a U.S. defense that is 90 percent effective, Moscow would have to increase its number of offensive strategic warheads by a factor of 19. This is an impractically large increase.[8] Therefore the increases in levels of offensive forces needed to overwhelm a U.S. strategic defense system would be too large and too costly to undertake. Although the "cost-exchange ratio," or the relative cost of offenses needed to overwhelm a defense, would clearly favor the offense momentarily after deployment of defenses began, this advantage would disappear quickly as more defenses came on line.

MILITARY PAYOFFS FROM A LIMITED FIRST-PHASE DEPLOYMENT OF SDI

The U.S. will derive military benefit from strategic defense systems the moment they are deployed. Deployment of a three-tiered system for terminal, mid-course, and boost-phase defense may take five

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8. Ibid., p. 8.

or more years to complete, but even a limited first-phase deployment of ground-based systems can provide partial protection once they reach initial operational capability.

Limited first-phase deployment of strategic defense systems would:

1) Complicate Soviet plans for a first strike: Although in the initial months following deployment U.S. defenses would be inadequate to blunt an all-out Soviet nuclear attack, they would have significant deterrent value against limited Soviet nuclear attacks designed to stop or slow down U.S. reinforcement of Western Europe or to demonstrate Soviet willingness to escalate a conventional war to the nuclear level. Limited defenses even would be useful against an all-out Soviet nuclear attack. The capability to destroy even a fraction of incoming Soviet warheads would complicate Soviet nuclear targeting and strategic plans. The consequence would be that Moscow would have less confidence that specific targets could be destroyed. Hence there would be greater likelihood that the U.S. could retaliate quickly with its own land-based ballistic missiles that survived the first barrage of the Soviet nuclear attack.

2) Protect the national command authority from Soviet first strikes: A limited initial defense could help protect key U.S. civilian and military command and control centers from Soviet ballistic missiles fired from submarines cruising off the U.S. coast.[9] Since these missiles would take only a few minutes to reach their targets in the U.S., they could neutralize the U.S. command authority and paralyze the ability of the U.S. to respond to the attack. A limited first-phase defense could protect key command and control centers against such attacks and thereby allow the U.S. to respond with its own retaliatory forces.

3) Protect against accidental launches: Strategic defense systems of limited capability could protect the U.S. against the accidental or unauthorized launch of a ballistic missile from a Soviet submarine. A ground-based ERIS system with only a few hundred interceptors would be more than enough to knock down the warheads fired from an errant or mad Soviet submariner.

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9. Senator Dan Quayle, "Away from the Extremes: Incremental SDI," Journal of Defense and Diplomacy, Vol. 4, No. 11, November 1986, p. 7.

NEAR-TERM DEPLOYMENT AND ARMS CONTROL

Deployment of strategic defenses would require renegotiating the 1972 Anti-Ballistic Missile Treaty. The two options for doing this are:

Option One: Abrogating the ABM Treaty: Article XV of the ABM Treaty gives each party the right to withdraw after giving six-months notice.[10] The circumstances under which this right would be invoked are "extraordinary events related to the subject matter of this Treaty [which] have jeopardized [one side's] supreme interests."[11] In citing what these "extraordinary events" are, the U.S. need only refer to ABM Treaty negotiator Gerard Smith's unilateral statement made on May 9, 1972:

> If an agreement providing for more complete strategic offensive arms limitations were not achieved within five years, U.S. supreme interests could be jeopardized. Should that occur, it would constitute a basis for withdrawal from the ABM Treaty.

Complete strategic offensive arms limitations were not achieved five years after the ABM and SALT I treaties were signed in 1972. Nor does the 1979 SALT II Treaty provide the kind of "complete strategic offensive arms limitations" envisioned by the ABM Treaty. SALT II was never ratified and therefore lacks the force of law. Even if SALT II were ratified, it does not limit the growth of offensive forces enough to stay with the mutual assured destruction doctrine implicit in the ABM Treaty. Since no binding complete agreement on strategic offensive arms has been reached since the ABM Treaty was signed, the U.S. could argue, if and when it decides it is prudent to do so, that there are grounds for a complete withdrawal from the ABM Treaty.

Option Two: Amending the ABM Treaty: Article XIV of the ABM Treaty states that "Each party may propose amendments to this Treaty."[12] Amendments can be negotiated in the Standing Consultative Commission (SCC) set up by Article XIII of the Treaty. Citing paragraph (d) of Article XIII, which states that changes in the strategic situation shall be discussed in the SCC, the U.S. could propose that amending the ABM Treaty is required because the strategic

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10. United States Arms Control and Disarmament Agency, Arms Control and Disarmament Agreements: Texts and Histories of Negotiations (Washington, D.C.: Arms Control and Disarmament Agency, 1982), p. 142.

11. Ibid.

12. Ibid.

environment that had been based almost solely on offensive forces has become unstable. The U.S. could argue correctly that ABM amendments to allow deployment of nationwide strategic defenses are required to meet the original strategic (in contrast to functional) intent of the ABM Treaty, which was to stop the nuclear arms race and to create more favorable conditions for further negotiations on limiting strategic arms. Building very effective defenses based on new technologies could reduce the military utility of offensive forces and thus make it more likely that their number eventually would be reduced to manageable levels.[13]

CONCLUSION

Deployment of U.S. strategic defense systems could begin as early as 1994. Then it will take another five to seven years to finish building a 90 percent effective strategic defense system. Although the system will not be as effective at the beginning of deployment as when it is completed, in the interim it still will protect the U.S. against accidental Soviet launches, anti-satellite weapons, and limited nuclear attacks on command and control centers in the U.S. and Europe.

Phased deployment of strategic defenses will not destabilize the U.S.-Soviet arms relationship; in fact it will stabilize it. The defensive capability derived from even limited strategic defense systems can frustrate Soviet planning for a first strike and thereby enhance the ability of the U.S. to deter war.

In the long run, deployment of SDI will encourage an arms control agreement with the Soviet Union. For one thing, deployment will undermine Moscow's current arms control tactic of linking progress in reducing strategic offensive forces to limits on strategic defense research and development. For another, once both countries possess strategic defenses, the Soviets may become more interested in reaching arms agreements that regulate their deployment and operation.

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13. However, it should not be expected that the Soviets will demonstrate any real interest in reducing offensive forces during the development and testing stages of SDI. So long as there is any possibility of stopping deployment, Moscow will most likely hold on to its present course of obstinate opposition to SDI. The Soviets may even want to reserve the option of proliferating offensive forces in the early stages of deployment as a countermeasure to a U.S. strategic defense system. But, eventually, as the first-strike or counterforce utility of these offensive systems becomes more questionable, Soviet leaders will have to consider whether their resources could not be better spent on defenses against U.S. ballistic missiles. Under these new strategic conditions Soviet concessions on offensive arms reductions should be expected a few years after deployment of the U.S. system has begun.

Finally, by reducing the military utility of offensive forces, strategic defense can encourage both sides to give them up in arms control agreements.

Technology gains have made SDI a possibility much sooner than anyone had imagined. Since deployment of strategic defenses is clearly in the U.S. interest, the Reagan Administration should make plans to start.

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