January 21, 1988

THE STRATEGIC DEFENSE INITIATIVE: A SHIELD, NOT A SWORD

INTRODUCTION

Soon after Ronald Reagan launched the Strategic Defense Initiative (SDI) in 1983, Moscow began to argue that, in reality, this new program was a cover for a U.S. effort to develop space-based offensive weapons. More recently, the Soviets have claimed that the purpose of SDI is to build a shield behind which the U.S. might launch a first strike on the Soviet Union. Although this is part of the Soviet propaganda campaign against SDI, some U.S. opponents of SDI echo similar views.

These arguments are without merit. SDI is a defensive shield, not an offensive sword. Reasons:

1) The laws of physics make it almost impossible to use SDI's defensive technologies, including directed energy, to achieve the mass destruction caused by strategic nuclear weapons. Even if it were possible, it would make little sense to duplicate capabilities the U.S. already possesses.

2) It is doubtful that even modest offensive space-based systems can be developed any time soon.

3) Even if modest space-based offensive systems could be developed, it would take years and cost billions of dollars.

4) The deployment of strategic defenses could not give the U.S. the ability to launch a first strike against the Soviet Union, as the Soviets suggest, given the low ratio of first-strike capable U.S. missiles and warheads to Soviet targets.

This is the 48th in a series of Heritage studies on strategic defense. Previous papers included *Backgrounder* No. 623, "A Timetable for Deploying A Strategic Defense" (December 14, 1987), and *Backgrounder* No. 621, "Basing Deterrence on Strategic Defense" (December 2, 1987).

A major advantage of SDI development, moreover, contradicts the Soviet argument about weapons of mass destruction. The unique characteristics of certain SDI technologies may speed the development of high technology, non-nuclear tactical weapons. This thus reduces, not heightens, the threat of mass destruction. Lasers now are being used for targeting and guiding conventional munitions. High energy lasers and other modern non-nuclear weapons may prove useful as battlefield weapons, fired from the ground, from aircraft, or from low earth orbit. Such systems may be able to strengthen U.S. and NATO conventional defense capabilities against a non-nuclear Soviet attack on Western Europe. That possibility should be explored thoroughly in cooperation with the NATO allies.

SDI will not produce "space strike" weapons for offensive purposes. There is no evidence that SDI is for offense or that it will become so. The SDI program should proceed at a rapid pace. It will protect the U.S. from nuclear attack and yield dividends for non-nuclear weapons as well.

ORIGINS OF OFFENSIVE USE THEORIES

Within months after Reagan launched SDI, Moscow began suggesting that SDI weapons in space could be a cover for preparations for a disarming first strike against Soviet missiles and that space-based weapons could be used for offensive or "space strike" purposes. The Kremlin has contended that placing such weapons in space, even for defensive purposes, would increase U.S. offensive capabilities. Some studies by Americans have probed the Soviet assertions. A very tentative report by R & D Associates of California,[1] for example, reviews possible offensive uses of certain SDI technologies as a basis for suggesting that SDI could have strategic offensive capabilities. The R & D Associates paper discusses the feasibility of using high-powered lasers of the kind under development in the SDI program to create massive fires in urban areas and some kinds of military installations. The authors, however, are careful to warn the reader that "almost every statement in this brief report requires further study." In addition, R & D Associates made no attempt to determine cost-effectiveness or to compare SDI with competing concepts. This did not prevent U.S. and foreign SDI opponents from using the seven-page study as the basis for allegations about the offensive potential of SDI.

Certain other SDI concepts have been seized upon by SDI opponents to illustrate the supposed offensive use of space-based defensive weapons. Because of the drastically reduced time scale for such advanced SDI technologies as lasers to reach their targets (laser weapons strike with the speed of light), SDI opponents argue that the temptation to conduct a first strike against the Soviets could be greater with space-based offensive weapons than with current strategic systems. Accordingly, the argument goes, their development could undermine strategic stability.

---

1. Albert L. Latter and Ernest Martinelli, "SDI: Defense or Retaliation," R & D Associates, May 28, 1985.

WHY SDI IS NOT OFFENSIVE

SDI Provides No New Strategic Capabilities

There are several problems with the suggestion that SDI will use lasers to destroy military targets on the earth's surface and to start urban conflagrations. For one thing, there are serious technical difficulties in using laser weapons to strike down through the earth's atmosphere; cloud cover over a target area, for instance, dissipates laser beam intensity. For another thing, even if defensive technologies could start "urban conflagrations," this would not give the U.S. a militarily meaningful capability in the age of nuclear-armed ICBMs.

There is no way, moreover, that SDI weapons could destroy missiles in their silos or other hardened military targets as confidently and effectively as highly accurate nuclear-armed ICBMs. Without being able to approach the capability of ICBMs, the impact of SDI technologies on the offensive strategic military balance is likely to be no more than marginal.

SDI opponent Robert English, a member of the group that calls itself the Committee for National Security, claims that: "While the presence of thick clouds would impede a laser strike, an attacker has the luxury of waiting until conditions are ideal (the defender does not)."[2] This ignores the obvious facts that the U.S. has neither a first-strike policy nor capability and that, if hostilities were already under way, it would be ridiculous in an age of high-speed weapons, such as ICBMs, to wait for good weather before striking. A laser weapon that must wait for good weather or a favorable position in orbit to be used provides little added offensive capability to U.S. strategic forces.

Space-based Offenses Are Incompatible with U.S. Targeting Policy

U.S. strategic targeting policy has not included deliberate attacks on Soviet cities for the purpose of killing people since the original massive retaliation concept was officially discarded. Use of SDI lasers in an offensive role to cause urban incineration thus makes no sense in terms of current or projected U.S. national security policy. For nearly two decades, official U.S. strategic policy has placed the highest targeting priority on the Soviet military, its political leadership, and critical economic targets. The objective is to strike such targets with as few non-combatant deaths and as little residual damage as possible. To the extent that militarily important targets that are underground, well defended, or otherwise protected can be attacked at all, they can be struck far more effectively with nuclear weapons than with any present or prospective SDI weapons, such as lasers or other directed-energy devices. And even if it were U.S. policy to cause urban conflagrations (which it is not), it could do so far more effectively with nuclear weapons than with any known defensive technologies.

---

2. Robert English, "Reagan's Peace Shield Can Attack, Too," *The Washington Post*, February 15, 1987.

A U.S. First Strike Is Impossible

Moscow's assertion that Washington might use space-based strategic defenses as a shield behind which the U.S. might launch a nuclear first strike is contradicted by the U.S. force structure. While the Soviet Union has developed and deployed a first-strike nuclear force, the U.S. has not. The Soviets have deployed 1,398 large land-based ICBMs, giving Moscow a superiority of 3 to 1 in overall nuclear throw-weight and 10 to 1 in hard target kill throw-weight. Moscow has 5,240 nuclear warheads on its first-strike capable SS-18 and SS-19 ICBMs, or five times the number of such weapons needed to destroy the entire U.S. land-based nuclear deterrent force.

By contrast, the U.S. has operational only 14 MX ICBMs and 300 Minuteman missiles with the new MK 12A warhead. These missiles carry a total of 1,040 of those warheads whose yield and accuracy make them first-strike capable weapons, although the capability of the 300 Minutemen is questionable. Even including the Minutemen, this is not nearly enough warheads for the U.S. to contemplate a first strike. It would require at least three warheads for each Soviet ICBM, or 4,200 first-strike capable warheads. This is nearly four times as many as the U.S. has operational.

Insufficient numbers of U.S. first-strike offensive weapons prevents the U.S. from contemplating a first strike, even if it wanted to do so. SDI does not change this fact in any way. Even if the U.S wanted to launch a first strike behind an SDI shield, it would not have enough first-strike warheads to do the job. On the other hand, Moscow's huge arsenal of such weapons means that the Soviet first-strike threat to the U.S. would be greatly increased if Moscow were to deploy comprehensive strategic defenses.

Offensive SDI Would Face Effective Countermeasures

SDI opponents curiously are silent about possible Soviet countermeasures to an offensive use of SDI. This is in sharp contrast to the host of countermeasures that SDI opponents envision against the defensive use of SDI. Yet, even cursory examination reveals that it is likely to be far easier to develop countermeasures to space-based offensive attacks against targets on land than it is to develop countermeasures for SDI defensive attacks against Soviet missiles in space on their way to U.S. targets.

Most surface targets could be shielded, placed underground, or otherwise hardened (as Soviet missile silos have been hardened with reinforced concrete walls and steel covers) to a very high degree against a space-based offense, and probably could be protected to a degree that would require laser power beyond the inherent capability of space-based or redirected weapons.

Concern about offensive attacks by ground-based laser beams, which are reflected and directed by space-based mirrors to targets on the ground, fails to consider that the mirrors themselves would have to be made sufficiently reflective to withstand the laser effects. But if mirrors could be developed to reflect high-energy laser beams without damage, then, as a countermeasure, protective reflector

mirrors could be placed on the ground as passive defenses to deflect laser beams away from high priority land-based targets.

SDI Weapons Have Limited Military Value Against Soviet Targets

Even if SDI weapons had some offensive capability against stationary Soviet military targets on the ground, it would be of limited future value. In recent years, Moscow has given high priority to both defensive and offensive mobile weapons systems, thereby reducing their vulnerability to attack. The two newest Soviet ICBMs, the SS-24 and SS-25, are mobile and difficult to target and track. Even with regard to easily targeted missiles in fixed silos, there is some suspicion that many Soviet ICBM silos do not contain missiles at all, and that the missiles themselves actually are dispersed and hidden throughout the vastness of the Soviet land mass.[3]

Uses of Kinetic Energy Weapons in Space Are Limited

The use in space of kinetic energy weapons (those that destroy targets by impact) to attack surface-based strategic targets in the Soviet Union, including such hardened targets as missile silos, is unlikely to be militarily or economically effective. Such an offensive system is not likely to replace or even supplement ballistic missiles, cruise missiles, or other offensive weapons that use nuclear explosives.

Kinetic energy weapons designed to be launched from platforms in space against targets on earth would require enormous and costly space-launch payloads to get all that equipment into orbit. The weapons would suffer major problems, moreover, on re-entering the earth's atmosphere. While such weapons could be designed to prevent burn-up on re-entry, they still would have to contend with the problem of serious air drag and deteriorating accuracy.

Moreover, the terminal guidance systems being considered for advanced U.S. strategic missile systems could not be applied to small space-based offensive kinetic energy weapons. These would have to be guided with great precision against defended ground targets while traveling at high speeds. In fact, it is doubtful if the relatively large and complex guidance systems designed for strategic missiles and warheads would be at all compatible with small, space-based kinetic energy weapons.

Even if space-based systems could strike in seconds, compared with the 30 minutes or more for intercontinental ballistic missiles, such systems would hardly be sufficiently effective to produce anything approaching a credible alternative to nuclear-armed ballistic missiles. The problems of feasibility and cost ineffectiveness would be too great.

---

3. Samuel Cohen and Joseph Douglass, "Arms Control, Verification and Deception," *National Security Record*, December 1985.

Cost Problems Are Immense

There are immense technical and cost problems associated with the concept of space-based kinetic energy systems designed for strategic offensive use. Fundamental design differences exist between a kinetic energy defensive system whose performance requirements are based on destroying an extremely soft target, such as a rocket booster in flight, and an offensive system that has to identify and destroy targets on the earth's surface, which can easily and cheaply be concealed and hardened.

Further, space-based non-nuclear kinetic energy systems easily could be much more expensive than an offensive system of earth-based strategic nuclear missiles. The number of satellites required to gain adequate offensive coverage by small, space-based weapons against the thousands of military and strategic targets in the large land area of the Soviet Union would be vastly more than the one to two thousand satellites estimated to be needed for a strategic defense that would intercept ICBMs in the "boost phase" shortly after their launch. Add to the large number of satellites the huge payloads needed to put in space high energy lasers or kinetic energy weapons with sophisticated guidance systems, and the cost of a space-based offensive system is likely to be astronomical.

SDI Development is Incompatible with Offensive Use.

There is the mistaken impression that offensive kinetic energy weapons could be developed and deployed in space clandestinely as part of the SDI program. This is simply untrue. There would be fundamental differences between the development and testing of kinetic energy offensive and defensive systems, involving different radars and sensors and different targeting and atmosphere penetration requirements. There is no way that an offensive space-based system could be deployed under the aegis of a defensive system.

To the technical and cost barriers to a practical offensive system must be added the dangers of the strategic arsenal's including very fast weapons that are extremely difficult to target accurately. Such weapons would be fired from moving platforms and would need very complex guidance systems.

Considering the technical uncertainties and high costs that would be involved, it is incomprehensible that any U.S. administration would try to deploy a "covert" strategic offensive capability under the guise of a defensive one. It would be close to impossible to carry out such a subterfuge in the open American society without Congress or the press learning about it, at least in peacetime.

NON-NUCLEAR OFFENSIVE POTENTIAL OF NEW TECHNOLOGIES

Though the new technologies being developed under the SDI program will be of little use to offensive nuclear forces, they show considerable promise for offensive conventional weapons. No one, including SDI opponents, raises objections to using new non-nuclear technologies for the development of conventional weapons. Such targets as tactical aircraft, Airborne Warning and Control System (AWACS) planes,

battlefield missiles, communications systems, and theater command and control centers, which would not be primary targets in a strategic nuclear war, would be high priority targets in a regional, conventional conflict. Such a conflict is almost certain to be outside the USSR. Anti-satellite defenses thus are likely to be significantly weaker than those inside the main target areas of the Soviet Union. In a conventional conflict, too, with large numbers of troops and equipment on the move, it would be difficult to conceal critical targets from reconnaissance. It also should be easier to hit conventional targets with short-range space-based weapons than with the longer-range systems that would be needed for strategic purposes.

If the full non-strategic offensive potential of SDI-spawned weapons technologies were to be realized, the result would be an ideal coupling of weapons delivery and target vulnerability. Targets could be attacked and destroyed by new high-tech weapons immediately after identification, before they have time to move out of harm's way. Such weapons might include high energy lasers in orbit or redirected by mirrors in space, or the hypervelocity kinetic energy projectiles in space that are now being developed under the SDI program.

CONCLUSION

Assertions by Moscow and by some American critics of SDI that the SDI program may have strategic offensive applications have been neither accurate nor objective. SDI is a defensive program, based on sound moral and strategic goals. Its purpose is to move the U.S. away from the doctrine of Mutual Assured Destruction (MAD), which contemplates the destruction of American society. In the long run, MAD endangers U.S. survival; by contrast, Soviet strategic defensive programs, active and passive, are intended to ensure the survival of the Soviet leadership.

Echoing Moscow. The attempt to label SDI as offensive is reminiscent of the attacks made against the development of the neutron bomb a decade ago.[4] Many of the leading foes of that weapon have re-emerged as outspoken opponents of SDI, using similar arguments. The arguments of these opponents today against SDI, and earlier against the neutron bomb, closely match the positions of the Soviet Union. These SDI opponents previously had put forth almost every conceivable reason why SDI defenses would not work effectively, while at the same time arguing that, if strategic defenses did work, they would dangerously destabilize the strategic balance. Now that it has become clear that SDI indeed is technically feasible, these same SDI opponents appear to claim that SDI technology is so highly feasible that it holds great offensive potential.

---

4. Alton Frye, "The High Risks of Neutron Weapons," *The Washington Post*, July 17, 1977.

The SDI program to develop strategic defenses for the U.S. should be accorded the highest national priority. It should not be impeded by false, unsubstantiated claims that it has a dangerous and destabilizing potential for strategic offense.

Prepared for The Heritage Foundation by
Samuel Cohen*

*Samuel Cohen is a Los Angeles defense consultant and is known as the father of the neutron bomb.